

AN ENVIRONMENTAL EDUCATION NEEDS ASSESSMENT STUDY
IN THE CARAZO DEPARTMENT OF NICARAGUA

by

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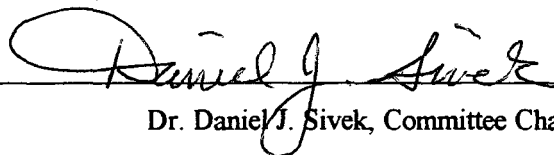
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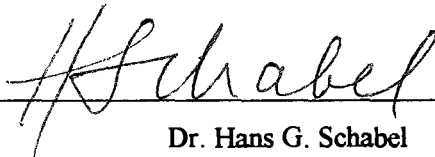
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ABSTRACT

Nicaragua, the largest and poorest country in Central America, possesses abundant natural resources that have been depleted and exploited at an alarming rate. Over the past 20 years, the Nicaraguan government has undertaken several measures to address the country's loss of natural resources. One of the measures implemented by the Ministry of Natural Resources and the Environment (MARENA) requires that every department (a political entity similar to a state) appoint an environmental commission which, in turn, will develop a strategic plan for environmental education in the department.

During 1997 and 1998, a needs assessment study was performed to assist the department of Carazo in defining actions that would help the department's environmental education commission develop an effective, locally-based education plan. The study's purpose was to identify environmental education needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in Carazo.

Based on rapid rural and participatory appraisal methods, the study used multiple methods to gather triangulated data. Personal interviews were conducted with 23 environmental education leaders representing government and non-governmental organizations on the national, departmental, and municipal levels. Surveys were conducted with approximately 10 percent of Carazo's teachers to determine the level of environmental education currently being included in the formal school system and to outline the needs and wants of teachers with regard to environmental education. Data were also collected from primary and secondary documents as well as through a focus group to determine the environmental education needs of the department, and gather information on and evaluate the perceived success of existing programs and available environmental education resources.

The results of the study indicated that Carazo's citizens desire increased formal and non-formal educator training and increased availability of resources that focus on the most critical environmental problems of Carazo (deforestation, solid waste management, water contamination, and the lack of environmental sensitivity, as indicated by participants in this study). The subsequent recommendations based on these findings center around three basic needs: the need to build on the department's existing environmental education strengths and programs; the need for more effective networking and sharing of environmental education information and resources

within the department; and the need to empower Carazo's citizens to be leaders in local environmental education efforts.

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CHAPTER ONE: THE PROBLEM AND ITS SETTING

The first chapter is an introduction to the study and contains the following information:

- I. Introduction to and Importance of the Study
 - A. Environmental Education in Nicaragua
 - B. The Carazo Department of Nicaragua
 - C. Significance of the Study

- II. Statement of the Problem and Subproblems
 - A. Problem
 - B. Subproblems
 - C. Assumptions
 - D. Limitations
 - E. Definition of Terms
 - F. Abbreviations

I. Introduction to and Importance of the Study

Environmental issues today are not affecting merely one country or another; rather, they are all inextricably linked through the global ecosystem. Deforestation in one part of the world may affect climate changes in another. Toxic substances released do not remain statically in that area but drift through the air or flow through the water across borders. Depletion of soil resources may lead to less productive farming methods and an overall decline in quality of life across an entire region, regardless of country lines.

Because of this interconnected web, it is imperative that global citizens work together to address global issues. However, the solutions must begin on a local level and then radiate outward to national and international levels. Participation of community action groups at all stages of environmental projects increases the likelihood of success. It facilitates national program and policy development because it taps into local social patterns and values that can determine the most effective pathways for implementation (Scriabine, 1996).

Central America is a region hit especially hard by a combination of environmental problems, exacerbated by the depletion of its once abundant natural resources. In Central America, as well as other more developed areas, most major environmental concerns focus around three areas: those dealing with the allocation of limited resources among populations who benefit unequally from the resources; those centering on the correction and prevention of pollution problems arising from increased development; and those determining the best method

to provide a physical and social environment which optimizes human life (Aldrich and Blackburn, 1973).

Looking more closely at the environmental issues within this framework, it is evident that Nicaragua in particular faces constant struggles in all three of the aforementioned environmental areas. Because of the extremely high level of indebtedness combined with the rich natural resources being depleted to pay off external debts, Nicaragua is challenged to maintain a balance between use and preservation of its environment. Resources such as clean water, available firewood, fertile soil for farming, clean air, and financial support are scarce and often poorly allocated among the population. Production of key export items such as coffee and soybeans generate large amounts of air and water pollution which only increase with the further development of the already heavily populated and highly industrialized western coast of Nicaragua (International Strategies Incorporated, 1995). Finally, the social and physical environment (referring to the flora, fauna, and nonliving aspects) is declining as health and environmental issues are closely linked. The depletion and misuse of natural resources leads to an increasingly precarious health situation (Sanchez, 1997).

Nicaragua has also had to deal with the difficulties associated with many years of internal strife and conflict including a civil war. The Somoza dictatorship ended in 1979, after four decades, as the government was overtaken by a broad-based revolutionary front. The revolution, led by the Frente Sandinista de Liberacion Nacional (Sandinista National Liberation Front [FSLN]), had a dramatic effect on the management and depletion of natural resources, the country's educational system, the social and religious climate, balance of payments, external debt situation and more (Arnove, 1995). The FSLN was originally very supportive of environmental reform and passed numerous laws dealing with environmental quality and education. The FSLN created the first environmental ministry (DIRENA) and began an extensive national parks system. However, the FSLN's environmental commitment did not last as the party was forced to focus on other, seemingly more urgent factors such as the continuing civil war and differences within the government over the relationship between development policies and environmentalism (Norsworthy, 1989).

The combination of critical environmental and social problems facing Nicaragua has led to an increase in the need for quality environmental education (EE). Environmental education can serve as a tool to integrate biological conservation with economic development, especially in developing countries (Bynoe and Hale, 1997). It helps increase public knowledge and skills and promotes a conservation ethic that enables citizens to become more responsible stewards of their

natural resources. Environmental education helps to change patterns of consumption at local and national levels and can also improve the technical capabilities of natural resource managers (Jacobson, 1997).

A. Environmental Education in Nicaragua

National level government and non-governmental organizations (NGOs) in Nicaragua are beginning to acknowledge the importance of environmental education, a relatively new field in Central America. In the fall of 1996, Nicaragua's first national environmental education conference was held, bringing together a diverse group of government agencies, NGOs, resource managers, educators, and students. Working together to brainstorm ideas, the conference participants defined environmental education within Nicaragua and agreed on the general direction in which programs need to go (Belli, 1997). However, no detailed plan was created and current programs around the country are operating in a rather disorganized and uncoordinated fashion.

Nicaragua has begun developing a national environmental education strategy through the Ministry of Natural Resources and the Environment (MARENA), with a scheduled completion date of summer 1998. Also working in coordination with MARENA on environmental education programming and strategies are various NGOs. However, concerns arise as environmental education activities are often undertaken by NGOs in a uncoordinated manner and with poor networking, resulting in duplication of effort and a waste of resources (Howell, 1994; Leal Filho, 1994).

Along with national level programs promoted by NGOs, local community action is also a necessary component to implement effective environmental education. For environmental education projects to be effective, they must empower local communities through recognizing the citizens' concerns and building on local expertise (Monroe, 1998). The programs will only be sustainable if there is local buy-in, support, and perpetual follow-up. If the local citizenry works in coordination with MARENA and NGOs, environmental concerns of the area can be targeted through tailor-made programs.

To address these issues, an environmental education needs assessment study was undertaken by the researcher, beginning with the Carazo department of Nicaragua. The study used a rapid assessment methodology to gather information on critical environmental issues needing to be addressed through environmental education, programs currently under way,

resources available, and plans for implementation of effective programming taking into account the information gathered.

B. The Carazo Department of Nicaragua

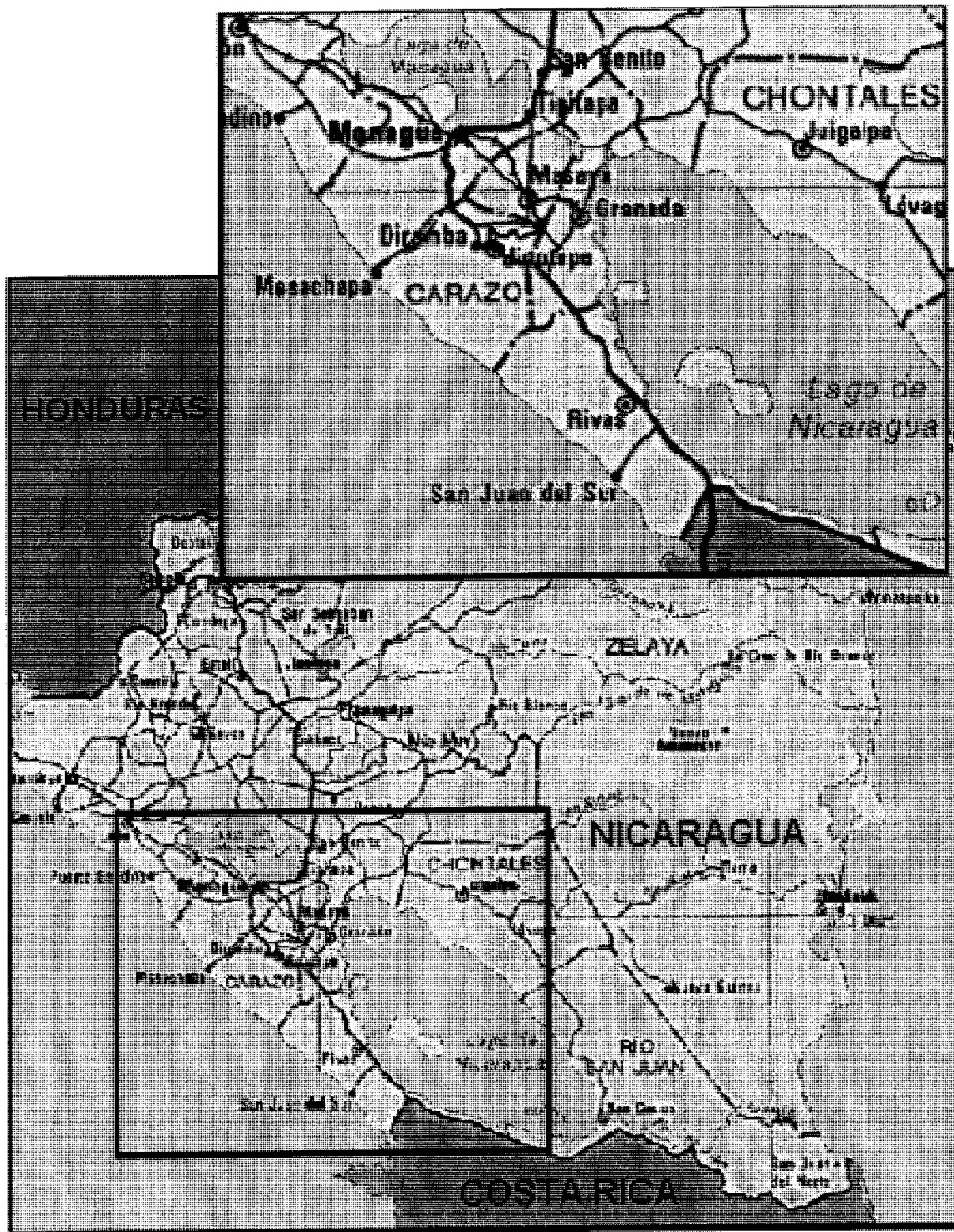
The Carazo department is located on the western coast of Nicaragua, south of the capital of Managua. (See Figure 1-1.) A department is a political entity similar to a state within the United States. Although geographically smaller in size than a typical U.S. state, it is administered through a similar state/national government arrangement. Carazo encompasses three major towns and various smaller municipalities. It reaches from the cooler, mountainous areas down to the Pacific coast. Because of this, several different ecosystems are found in Carazo, ranging from cloud forest to tropical dry forest to the coastal and marine systems.

There are currently several environmental education programs underway in this department that are meeting with mixed success. Minimal resources for environmental education are available in Carazo but these resources are not yet linked together to provide a contiguous and cost-effective system of education. Carazo's MARENA representative has a strong personal interest in and commitment to environmental education. However, at this point no widely coordinated environmental education efforts have been successfully undertaken in the department.

An interest in environmental education has been demonstrated by local government and non-governmental community leaders through the formation of a Carazo Environmental Education Commission. This commission, formed in 1996, consists of representatives from various government and non-governmental organizations (see Appendix A) with an interest in environmental education (Campos, 1997). The committee has worked to define the major barriers to environmental education in Carazo and hopes to establish an effective strategic plan for environmental education in the department (Echaverry, 1997).

It is because of the community leaders' interest in environmental education and their efforts to establish environmental education programs that Carazo was chosen as the region of focus for this needs assessment study. Several resources are already in place and there are interested people within the region who are likely to support the outcome of the study.

Figure 1-1: Political Map of Nicaragua Highlighting Carazo



C. Significance of the Study

Results from this needs assessment study will assist the Carazo department in creating a strategic environmental education plan that links with MARENA's national environmental education framework. The strategic plan will also incorporate elements of successful programs in Carazo and other Nicaraguan departments, building on these elements and avoiding common pitfalls. By having the background information provided through this study, Carazo's Environmental Education Commission will be able to make informed decisions regarding resource allocation to environmental education, a critical aspect of the community infrastructure.

Within the field of environmental education, this study represents a groundbreaking model for compiling needs assessment information in Nicaragua. Several other departments, including Jinotega and Granada, have expressed interest in having an environmental education needs assessment study performed in their department to evaluate the region and ensure that their planning methods effectively encompass the needs and wants of the local citizenry as well as NGOs and governmental organizations (Belli, 1997).

Environmental education lays a foundation for an environmentally literate citizenry. Continued environmental education, firmly based on this foundation, allows developments to continue in knowledge and skills, values, and attitudes. It leads to a better quality of environment and higher quality of life for present and future generations (Stapp, 1979).

Environmental education is becoming increasingly visible and recognizably important in Nicaragua. With the advent of ecotourism in its natural areas, it has become critical to define what levels of resource management and use citizens consider acceptable. In a social context, many Nicaraguans recognize the importance of knowledge of and concern for environmental issues but they are often eclipsed by other problems plaguing the nation such as health and financial issues. Nicaraguan citizens, however, are developing a greater awareness of the intricate connections that exist between many of the health, financial, and environmental issues facing the country.

Remembering the interconnected role that all citizens of the world play in maintaining a safe and healthy environment, it becomes clear that improved environmental education in Nicaragua touches the lives of people in other countries, despite the economic level or geographic location. For this reason, this needs assessment study performed a critically needed service in providing baseline data for quality environmental education in Carazo and, by extension, Nicaragua, Central America, and the world as a whole.

II. Statement of the Problem and Subproblems

A. Problem

This research proposes to identify environmental education needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in the Carazo department of Nicaragua.

B. Subproblems

- 1) The first subproblem is to identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations.
- 2) The second subproblem is to identify and describe the design and perceived success of environmental education programs currently underway in Carazo.
- 3) The third subproblem is to identify and describe existing resources (e.g. people, printed materials, protected areas, and so on) for environmental education in Carazo.
- 4) The fourth subproblem is to recommend subsequent actions for use in the Carazo department, based on the findings regarding environmental education needs, programs, and available resources.

C. Assumptions

- 1) The individuals interviewed have an interest in and knowledge of environmental education in Carazo.
- 2) A compilation of the existing environmental education programs, available environmental education resources, and support for environmental education in Carazo will indicate several potential courses of action.
- 3) Government and non-governmental organizations (NGOs) in Carazo have an interest in obtaining and utilizing information regarding the current state of environmental education

programs and resources to create a more effective strategic plan for environmental education in the department.

- 4) The teachers surveyed are a representative sample of teachers in Carazo.

D. Limitations

- 1) The focus groups and interviews will be conducted through a translator.
- 2) The reviewing of printed materials will be accomplished partially through a translator.
- 3) The department with which the researcher is working is located in Nicaragua while the researcher is based out of Wisconsin and Washington, D. C.
- 4) The majority of the research will be conducted during a three-week period in August 1997 and a two-week period in January 1998.
- 5) The political history of Nicaragua may prevent government and non-governmental officials from being completely candid in their assessment of current environmental education programs and available resources.
- 6) Many of the schools targeted during the teacher survey portion of the study are located several miles from the nearest town or mode of public transportation, making visits to these schools extremely difficult.
- 7) Cross-cultural bias may affect the analysis performed and recommendations made by the researcher.

E. Definition of Terms

Companeros Nicaragua-Wisconsin: The southern part of the partnership between Wisconsin and Nicaragua through the Partners of the Americas, which is administered through an office in Managua, Nicaragua.

Conservation Education: Education which promotes a conservation ethic that enables people to become responsible stewards of natural resources, changes patterns of consumption of natural resources, and increases public knowledge and skills regarding resource management and conservation policies (Jacobson, 1997).

Cross-cultural Bias: Bias that may occur in a situation where an external researcher is a member of one cultural group and the people being evaluated are of a different cultural group who may speak or prefer to use another language (Slaughter, 1991).

Department: Region politically similar to a state within the United States. Nicaragua is divided into 17 departments (Merrill, 1993).

Environmental Education: The part of education whose goal is to help students become environmentally aware, knowledgeable, skilled, dedicated citizens who are committed to work, individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things (Engleson and Yockers, 1994).

Participatory Rural Appraisal: A family of approaches and methods to enable rural people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act (Chambers, 1992).

Partners of the Americas: A private, nonprofit and nonpartisan organization that pairs U.S. states with Latin American and Caribbean countries in people-to-people partnerships (Partners of the Americas, n.d.).

Rapid Rural Appraisal: A form of data collection in which an outside researcher controls, analyzes, and acts on information gathered from rural people (Chambers, 1992).

Wisconsin-Nicaragua Partners: The northern part of the partnership between Wisconsin and Nicaragua through the Partners of the Americas, which is administered through an office in Stevens Point, Wisconsin.

E. Abbreviations

ADECA: Asociacion para el Desarrollo Comunal de Carazo (Community Development Association of Carazo)

BID: Banco InterAmericano de Desarrollo (InterAmerican Development Bank or IDB)

CECOTROPIC: Centro de Estudios de Ecodesarrollo para el Tropico (Center for Tropical Ecodevelopment Studies)

COMAREN: Comision del Medio Ambiente y Recursos Naturales (Comission of the Environment and Natural Resources)

CNW: Companeros Nicaragua-Wisconsin

EE: Environmental Education

FUNCOD: Fundacion Nicaraguense para la Conservacion y el Desarrollo (Nicaraguan Foundation for Conservation and Development)

IDB: InterAmerican Development Bank

IEEP: International Environmental Education Programme

IUCN: International Union for the Conservation of Nature (UICN in Spanish)

MAG: Ministerio de Agricultura y Ganaderia (Minister of Agriculture and Livestock)

MAN: Movimiento Ambientalista Nicaraguense (Nicaraguan Environmental Movement)

MARENA: Ministerio del Ambiente y Recursos Naturales (Ministry of Natural Resources and the Environment)

MED: Ministerio del Educacion (Ministry of Education)

MEDE: Ministerio de Economia y Desarrollo (Minister of Economy and Development)

MINSA: Ministerio de Salud (Ministry of Health)

NGO: Non-governmental Organization

PAA: Plan de Accion Ambientale (Environmental Action Plan)

POA: Partners of the Americas

POSAF: Programa Socioambiental y de Desarrollo Forestal (Socio-environmental and Forest Development Program)

PRA: Participatory Rural Appraisal

RACE: Rapid Assessment for Conservation Education

RRA: Rapid Rural Appraisal

UN: United Nations

UCA: Universidad Centroamericana (Central American University)

UNA: Universidad Nacional Agraria (National Agricultural University)

UNEP: United Nations Environmental Programme

UNESCO: United Nations Environmental, Social, and Cultural Organization

USAID: U.S. Agency for International Development

WNP: Wisconsin-Nicaragua Partners

WWF: World Wildlife Fund

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

Introduction

This chapter will provide an overview of related research and literature to establish a historical and academic context for the study. The purpose of this study is four-fold: to identify environmental education needs in the Carazo department of Nicaragua; to identify and describe the design and perceived success of environmental education programs currently underway in Carazo; to identify and describe existing resources for environmental education in Carazo; and to recommend subsequent actions for use in Carazo based on the findings regarding environmental education needs, programs, and available resources.

This literature review will discuss the following:

- I. International Environmental Education
 - A. History of Environmental Education
 - B. Definition of Environmental Education
 - C. International Aspects of Environmental Education

- II. Environmental Education in Nicaragua
 - A. Nicaragua's Environment
 - B. History of Environmental Education in Nicaragua
 - C. Environmental Education in the Carazo Department

- III. Needs Assessment in Environmental Education
 - A. Definition and Philosophy of Needs Assessment
 - B. Participatory Rural Development Models for Needs Assessment
 - C. Rapid Assessment Models for Needs Assessment

I. International Environmental Education

A. History of Environmental Education

Environmental education as an international movement has had several highlights that have brought the field to the point at which it exists today. However, as stated by Carlton, 1997, "Whenever one investigates the history of a movement, one is likely to encounter a variety of opinions regarding the circumstances and details that gave rise to [it]." The following brief overview of the history of international events provides a framework of understanding for the field of environmental education but is not intended to be a comprehensive discussion of all of the laws, conferences, and individuals who have shaped environmental education.

In the 1970s, a worldwide movement to encourage deeper awareness of and concern for the environment led to several international meetings in support of environmental education. At the 1972 United Nations Conference on the Human Environment in Stockholm, Sweden, representatives recommended that an international environmental education program be established. Following this recommendation, the International Environmental Education Program (IEEP) was created in 1975 through a collaboration of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) with the United Nations Environmental Programme (UNEP) (Braus and Wood, 1993). Its objectives were to assist governments and national, regional, and international institutions to incorporate environmental education into formal and non-formal education systems and programs to achieve greater international environmental literacy (Carlton, 1997).

In 1975, the same year as the IEEP was begun, the first international workshop focused on environmental education was held in Belgrade. The workshop brought together representatives from 65 countries to review and discuss trends and emerging issues in environmental education, and to formulate preliminary guidelines and make recommendations for the further development of environmental education. The resulting Belgrade Charter detailed a framework for environmental education and made recommendations dealing with further research in the field, encouraging environmental education as life-long learning, developing programs, the role of the mass media, the training of personnel, instructional materials, funding and evaluation (Carlton, 1997).

Inspired by the Belgrade workshop, regional meetings were held in Africa, Asia, Latin America, and North America to outline environmental problems particular to each area. From this, actions to specifically address each continent's needs were developed, taking into account the region's physical, socioeconomic, and cultural characteristics. These actions were compiled and reviewed to be used at the Tblisi meeting (Glasgow and Robinson, 1983).

The First Intergovernmental Conference on Environmental Education, better known as the Tblisi Conference, was held in 1977 in Tblisi, Georgia (USSR). It was organized by UNESCO, UNEP, and IEEP and included 265 representatives from 66 UN member nations. The representatives gathered to follow-up on the recommendations made at the Belgrade workshop and to review the results of the regional meetings. In what is known as the Tblisi Declaration, the first official definition of environmental education as well as a set of five objectives for environmental education were ratified (Appendix B). The Tblisi Declaration also included a set of "Guiding Principles of Environmental Education" (Appendix B) consisting of twelve

statements that extended environmental education beyond a formal education audience to incorporate all citizens, adults, and environmental professionals in increasing environmental literacy worldwide (Disinger and Monroe, 1994).

In 1992, the United Nations Conference on Environment and Development (UNCED) was held in Rio de Janeiro, Brazil. The participants reached consensus and adopted the action plan, *Agenda 21*, which incorporated the recommendations of the Tblisi Declaration and built on them by including three new program areas. These program areas included reorienting environmental education toward sustainable development, increasing public awareness for environmental education, and promoting environmental education training. To help with the reorientation of environmental education toward sustainable development, additional objectives were added to the document. They were:

to strive to achieve the accessibility of environmental and development education, linked to social education, from primary school age through adulthood to all groups of people; and to promote integration of environmental concepts, including demography, in all education programs, in particular the analysis of the causes of major environmental and development issues in a local context, drawing on the best available scientific evidence and other appropriate sources of knowledge, and giving special emphasis to the further training of decision makers at all levels.

(Engleson and Yockers, 1994)

B. Definition of Environmental Education

There are numerous definitions of environmental education though most have similar threads as they are based on the 1977 Tblisi Declaration. The Tblisi Declaration defines environmental education as:

a process aimed at developing a world population that is aware of, and concerned about, the total environment and its associated problems, and which has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

(UNESCO, 1978)

The objectives outlined in the Tblisi Declaration provide a further break down of this definition.

Awareness: to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.

Knowledge: to help social groups and individuals gain a variety of experiences in and acquire a basic understanding of the environment and its associated problems.

Attitudes: to help social groups and individuals acquire a set of values and feelings of concern for the environment and motivation for actively participating in environmental improvement and protection.

Skills: to help social groups and individuals acquire the skills for identifying and solving environmental problems.

Participation: to help provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

(UNESCO, 1978)

The critical ideas that run through all definitions of environmental education punctuate the difference between it and similar fields. Environmental education is an umbrella term for education that “focuses on the total environment (natural and built) and emphasizes attitudes, values, skills, knowledge, motivation, and participation to solve environmental problems” (Braus and Wood, 1993). The part of environmental education that focuses on natural resource education and management issues is known as conservation education. Outdoor education emphasizes activities that take place outside of the classroom and often has more of a self-development focus rather than specifically teaching about the environment (Braus and Wood, 1993).

Since the Tblisi Declaration, the definition and objectives set forth, as well as the Guiding Principles of Environmental Education, have been used by educators, philosophers, researchers, and curriculum developers to incorporate environmental education into everyday learning (Disinger and Monroe, 1994). To bring the Tblisi Declaration’s principles and definition of environmental education to a useful level in formal and non-formal education settings, individuals and organizations have been adapting the Tblisi ideas as the world’s environmental problems evolve and change.

C. International Aspects of Environmental Education

Environmental education is a field that requires international cooperation to create the most effective outcomes as “decisions in one part of the world frequently affect, often instantaneously and dramatically, people, industries and cultures in other regions of the world” (Stapp, Cox, Zeph, and Zimbelman, 1983). Although grassroots efforts are crucial components,

a global perspective and international understanding are necessitated by the very nature of the subject. Harper (1972) remarks that

Most action taken to solve environmental problems will be at the national and local levels, but local solutions are not likely to add up to an overall world solution because the simplest and cheapest methods of solving the national and local problems may make the overall problem worse. Therefore an international view of the issues is required.

Human and natural activities in one part of the world are inextricably linked to the worldwide ecosystem, economy, and even political situation. As the flow of supplies, products, human resources, information and money across international borders increases, all aspects of natural and human-made systems are automatically effected (Stapp, Cox, Zeph, and Zimbelman, 1983). Because of these close connections, environmental education is a subject in which citizens of all countries are influenced by other citizens' actions.

Aldrich and Blackburn (1973) espouse that environmental concerns center around three interacting, interinfluencing categories that have individual, local, national and international implications. These categories are:

- those dealing with the allocation of limited resources among populations that now vary greatly in the degree to which they benefit from those resources,
- those dealing with the correction and prevention of pollution problems arising from the development or utilization of natural resources, and
- those dealing with how best to provide and preserve a social as well as physical environment that optimizes human existence.

(Aldrich and Blackburn, 1973)

The international recognition of the importance of coordinated education efforts in developing an environmentally-literate global citizenry led many countries to create their own environmental education plans and programs based on the IEEP recommendations. Since the 1970s, environmental education in Nicaragua has developed following the global model created through the Belgrade Charter and Tblisi Declaration. Environmental education is slowly but surely becoming increasingly recognized as a key component in the protection of the country's abundant natural resources.

II. Environmental Education in Nicaragua

A. Nicaragua's Environment

Nicaragua's varied environment encompasses numerous ecosystems including tropical dry forests, coastal wetlands, tropical cloud forests, and tropical rain forests as well as one of the largest submarine platforms in the Caribbean that is home to a large number of endemic and endangered species. More than 10,000 species of flora have been identified in Nicaragua and many more may exist in its rain forests (Peace Corps, 1995).

The rich and extensive natural resources in Nicaragua have long been exploited by the country's quickly growing population as well as foreign interests. Agroexports such as cotton, sugar, and beef in conjunction with unregulated free-market policies were several factors that led to the environmental devastation evident by the 1970s (Norsworthy, 1989).

The 43 year Somoza dictatorship, which ended in 1979, left behind a wake of environmental problems and severely depleted natural resources. Extensive deforestation resulted from timber concessions granted to transnational lumber companies. Norsworthy (1989) states that "approximately one-third of Nicaragua's tropical rain forests had been leveled by agricultural colonization and cattle-ranching schemes which constantly pushed forward the agricultural frontier." Widespread water pollution occurred in numerous streams and rivers. Lakes Managua and Nicaragua, which cover a large part of the country's south-central area, were severely contaminated by industrial pollution. An intensive agricultural industry based on the fragile soils of the country's western plains led to soil erosion, dust storms, mud slides, and flash floods (Norsworthy, 1989).

However, during the Sandinista period of the 1980s, this destruction was briefly stopped. As noted in Merrill (1993), "For a short time at least, the Contra war had the accidental effect of stopping the aggressive exploitation of Nicaragua's natural resources." This was partially because the opposition Contra forces did not hold territory in Nicaragua but rather were based across international borders in Honduras and Costa Rica (Merrill, 1993). Additionally, the Sandinistas moved 200,000 people away from combat areas, creating large pieces of land that were allowed to return from agricultural lands to their natural state.

The Sandinista movement was partially based on agrarian reform and espoused greater environmental protection. It was receptive to national and foreign-based non-governmental organizations working in the conservation field (Norsworthy, 1989). In 1979, almost immediately after the overthrow of the Somoza regime, the Sandinistas nationalized the

country's natural resources and forest lands in an attempt to end the exploitation of forest, mineral, and aquatic resources by foreign companies (Norsworthy, 1989). In 1980, the Nicaraguan Institute for Natural Resources and the Environment (Instituto de Recursos Naturales, IRENA) was established to direct natural resource conservation policies. Several large-scale nature reserves were created and management plans were devised for watersheds and rain forests. Merrill (1993) theorized that, "this combination of accidental and intentional environmental conservation in the early 1980s temporarily delayed the destruction of land associated with expanding export agriculture."

The environmental protection measures undertaken by the Sandinistas did not represent the end of environmental problems in Nicaragua, though. During the civil war period of the 1980s, Contra activity ended IRENA's work as many park managers were kidnapped, reforestation projects were burned, and nurseries were destroyed (Norsworthy, 1989). Additionally, the economic problems experienced by the country shed light on the Sandinista's "less than complete commitment to environmental protection" as they undertook major development projects and began to, once again, exploit the natural resources for export materials to sell for foreign currency (Norsworthy, 1989).

By the 1990s, Nicaragua's rain forests were disappearing at the rate of approximately 150,000 hectares annually, a rate ten times faster than in the Amazon. Forest cover decreased from 7.0 million hectares in 1950 to only 4.3 million by 1990 (Peace Corps, 1995). Merrill (1993) expresses concern in saying, "If that rate continues, the Nicaraguan rain forest will have disappeared by 2010."

As much of the hope for the recovery of Nicaragua's economy is based on continued exploitation of natural resources, sustainable use and development are key factors in wise use of the resources. Through the 1970s and 1980s, agricultural production expanded by converting forested lands to agricultural use. Moreover, natural resource exploitation occurred in a manner that treated renewable natural resources as non-renewable ones, "essentially 'mining' the resource base of the country" (Peace Corps, 1995). However, policy reform and environmental education can be important tools to foster appreciation for the environment and increase ecological awareness. They work to promote natural resource conservation that produces income while preserving the country's environmental integrity.

B. History of Environmental Education in Nicaragua

In 1993, the Plan de Accion Ambiental (PAA) or "Environmental Action Plan" was created by the Nicaraguan Ministry of Economy and Development (MEDE) and IRENA (now MARENA). The project was funded by the Swedish and Danish governments as well as the World Bank and served to address the increasing concern over natural resource depletion in Nicaragua (Peace Corps, 1995).

The PAA addressed three main objectives for environmental education in Nicaragua. The objectives were:

- 1) To identify the principal environmental problems affecting Nicaragua.
- 2) To create a framework for environmental policies to be incorporated into national development plans.
- 3) To define the priority interventions.

(Peace Corps, 1995)

In addition to the three major objectives, the plan included a strong component to encourage public participation on the local level. The process of identifying Nicaragua's principal environmental problems included representatives from 1,400 municipal level governmental and non-governmental organizations. Eighty-nine of the country's 143 municipalities worked together to compile a list of critical environmental problems that needed to be addressed (Peace Corps, 1995).

Deforestation, scarcity and contamination of water sources, and a lack of environmental education were determined to be the country's top three environmental problems. Additional issues included forest fires, soil erosion, lack of urban planning, and environmental pollution (Republica de Nicaragua, 1993).

Three priority interventions or actions were highlighted through the same process. These were determined to be:

- 1) Programs involving reforestation, environmental education, and environmental law.
- 2) Projects involving training and technical assistance, potable water, and institutional strengthening.
- 3) Promotion of municipal self-reliance, forest management for employment, soil conservation, environmental sanitation, watershed management, formation of civil brigades for environmental protection,

clarification of land tenure, relocation of market facilities, domestic sanitation (latrines), and waste treatment.

(Republica de Nicaragua, 1993)

According to the Peace Corps (1995), although the environmental problems identified by the municipalities are serious impediments to sustainable development, "it is the low level of awareness about environmentally sound alternatives that must be changed if other resource management efforts are to be successful." Additionally, "there is little conscience at the community-level that individuals have a responsibility to take actions to manage the natural resources or to restore them."

Several actions have been taken by the government, often working in conjunction with NGOs, to address these environmental concerns. IRENA (now MARENA) created an environmental education department in 1981 to provide support to MED and other organizations interested in environmental education. However, because environmental education was supposed to be an integral part of all of MARENA's programs and due to downsizing resulting from financial constraints, MARENA's environmental education department was closed in the mid 1980s (El Quehacer Nacional en Educacion Ambiental, n.d.). After extensive reorganization within MARENA, the environmental education department reopened in 1996 and now has five full-time employees dedicated to environmental education.

In 1992, environmental education was added to Nicaragua's national curriculum. In 1994 the Ministry of Education (MED) and Center for Democracy Studies defined a framework for environmental education within Nicaragua's primary and secondary school curricula. However, even with environmental education as a mandated part of the national curriculum, lack of teacher training, in conjunction with other factors, has prevented extensive environmental education in Nicaraguan schools (Peace Corps, 1995).

MED recognized significant obstacles to environmental education as the lack of training for primary school teachers, budget constraints, and centralization. MED worked with FUNCOD to develop more accessible curriculum and encourage incorporation of environmental education into elementary classrooms (Peace Corps, 1995). Unfortunately, as evidenced by Bynoe and Hale when working in the Caribbean, "education for the environment is treated as a peripheral issue [as it] is considered a long term investment that does not yield immediate results, so that politicians . . . are often not convinced of its importance." Because of its treatment as a

“peripheral issue,” funding for environmental education teacher training programs has been scarce and ample resources have not been allocated to environmental education in Nicaragua.

In 1996, the first National Conference on Environmental Education was held. Organized by the National Commission for Environmental Education (Comision Nacional de Educacion Ambiental, CNEA) and MARENA, it was intended to encourage open discussion between diverse groups and individuals involved with environmental education in Nicaragua.

Throughout the 1980s, interest in environmental education had been growing around the country but efforts and programs were disjointed, without any sharing of information and experiences between groups. One of the main objectives of the conference was to create a philosophical framework that detailed strategies, plans, programs and projects. It was felt that the lack of this framework had been a major impediment to the development of effective and pervasive environmental education in Nicaragua.

The objectives outlined at the conference were to:

- 1) Compile information on the politics and strategies of environmental education on the local and national level.
- 2) Share environmental education experiences that [will be/should be] carried out on the local and national level, by facilitating intergovernmental coordination as well as coordination among governmental and civil organizations.
- 3) Identify and develop methodologies that will be used in the implementation of environmental education programs.
- 4) Establish a network of people active in environmental education at the local and national levels.

The expected outcomes outlined were:

- 1) A national framework for environmental education.
- 2) Identification of the problems with and limitations to environmental education.
- 3) Standards and strategies for environmental education at the national and local levels.
- 4) Objectives for a short and medium term plan for the development of an environmental education program.
- 5) Systematized methodologies for successful environmental education.

- 6) Network of local and national people involved with environmental education.
- 7) Proceedings of local and national environmental education meetings.

(MARENA, 1996)

C. Environmental Education in the Carazo Department

Nicaragua's PAA encouraged local participation in the creation of a national plan for environmental education. In addition to including representatives from 89 municipalities in outlining the country's environmental education objectives, the government also recommended that each department should form its own commission to deal with environmental education policy and programming.

In July 1997, the first meeting of the Carazo Commission for Environmental Education was held. (The objective of this first meeting was to obtain a "diagnosis of the environmental situation" in Carazo. The general objective of the commission is to promote environmental education within the department and, to do this effectively, the commission felt it needed to obtain baseline data on the situation.) Carazo's four major municipalities, Jinotepe, Diriamba, San Marcos, and Santa Teresa, each have commission representatives who are appointed by their mayors. Also included are representatives from local government and non-governmental organizations (Appendix A).

Nicaragua has worked to increase the awareness of and interest in environmental education through governmental and non-governmental channels, on both national and departmental levels. However, to truly create a site-specific environmental education program and to develop an effective environmental education plan for Carazo in particular, it is necessary to have more detailed information on the state of environmental education in the department. A needs assessment study can provide information on environmental issues facing the department, programs currently underway, and resources available for environmental education in Carazo.

III. Needs Assessment in Environmental Education

A. Definition and Philosophy of Environmental Education Needs Assessment

Effective environmental education requires programming tailored to citizens' needs and environmental problems existing in a particular area. Needs assessment studies research communities' preferences, desires, and opportunities. They compile comprehensive data for the

creation and evaluation of environmental education programs. The environmental education needs assessment study presented in this paper looks at environmental education in Carazo. It presents baseline data on the environmental issues, programs, and resources currently in existence in the department, taking into account various national and local, government and non-governmental audiences.

According to Butler and Butler (1987), needs assessment has established itself as a promising international development tool that effectively includes large numbers and various levels of stakeholders in the evaluation process. They state,

Needs assessment can address several purposes concurrently: Building the capacity of local, national, and donor organizations to respond to the real problems . . . of local people; taking advantage of indigenous resources, human and physical; serving as a learning laboratory to strengthen people's knowledge and skills for participating in public decision-making processes; collecting accurate, reliable, and useful information; and developing mechanisms for responding to short-term objectives that are compatible with long-term goals.

Needs assessment is especially crucial in the early planning stages of program development, such as that which exists in Carazo with regard to the development of a strategic plan for environmental education. The project design stage offers great opportunities for needs assessment as "so much of the project's future rests on an accurate, early assessment of clientele needs" (Butler and Butler, 1987). An effectively designed environmental education program takes into account the following elements, each of which can be gleaned through a needs assessment study: identification of the problem, clientele needs, resources available, resources needed, project goals, and implementation strategies (Butler and Butler, 1987).

The quickly growing interest in and unique aspects of environmental education require the development of effective needs assessment techniques specifically for environmental education (Jacobson, 1995). Needs assessment studies provide a framework for identifying a region's environmental education needs and, stemming from the perceived needs, direct the creation of plans to address these needs. According to Jacobson (1995), "Effective assessment techniques offer a flexible, interactive process for making decisions about the content, focus and methods of environmental education programs based on available resources as well as spatial and temporal constraints."

The techniques used in environmental education needs assessment have been compiled from other field methods including systems models for program evaluation (Jacobson, 1991),

participatory rural development approaches (Odour-Noah et al., 1992), and ecological assessment techniques (Grossman, Iremonger, and Muchoney, 1992). Needs assessment studies use quantitative as well as qualitative methodology to gather detailed information from a variety of sources.

B. Participatory Rural Development Models

Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA) are needs assessment evaluation techniques used in natural resources management (soil and water conservation, forestry, fisheries, wildlife, village planning, and so on), agriculture, programs for the poor, health, and food security (Chambers, 1992). This family of approaches was developed to shift information gathering in developing countries away from extractive methods toward integrated methods, including local citizens in the decision-making process. PRA and RRA methods enable rural people to share, enhance, and analyze their knowledge of life and conditions, to plan and to act (World Wide Fund for Nature, 1997).

Beginning in the 1980s, RRA and PRA approaches evolved to solve the problem of finding cost-effective methods for outside researchers to learn about rural conditions and people, especially in developing countries (Chambers, n.d.). These techniques are based on the idea that local people provide the best information on the environmental situation in their community. Additionally, they are cost-effective, especially in situations where information gathering time is limited (Chambers, n.d.). RRA and PRA methods elicit a range and quality of information and insights inaccessible through more traditional methods, like questionnaires and surveys (Chambers, 1992).

RRA and PRA share common principles, although PRA builds on RRA to allow the researcher to become more closely integrated with the local community. As discussed by Chambers (1992), both methods focus the information gathering process on the local people and learn from the local physical, technical, and social knowledge. Both are committed to rapid and progressive learning and maintaining flexibility in the research design. Taking time to spend with the citizens and seeking out women and poorer community members allows PRA and RRA methods to develop a deeper understanding of the local situation. Finally, PRAs and RRAs encourage triangulation, meaning that they use a range of methods, types of information, investigators, and/or disciplines to cross-check the information gathered.

PRA goes beyond RRA in several ways. In PRA, the citizens facilitate the investigation and analysis processes themselves. Often the outside researcher begins the process and then

steps away to allow the local people to have ownership in the process and experience their own learning. PRA is also a self-critical process in which the researcher is constantly examining her/his own behavior and making changes to most effectively facilitate community learning. Additionally, the sharing of information, experiences and ideas between rural people and facilitators is heavily emphasized in PRA (Chambers, 1992).

Numerous and varied techniques are used in PRA and RRA to gather information from local people and communities. Chambers states that all of the methods are used in both PRA and RRA but some are more emphasized in one than the other. The methods include but are not limited to: review of secondary sources; semi-structured personal interviews; group interviews; focus groups; participatory mapping, modeling, and diagramming; trend analysis; simple questionnaires; stories, portraits, and case studies; and presentations and analysis (Chambers, 1992).

PRA and RRA methods are useful in environmental education needs assessment as they provide a wide range of information, systematically collected, using both qualitative and quantitative research methods. Often developing countries lack substantial educational, environmental, or socio-demographic information and PRA and RRA methods can help fill these gaps in an efficient and effective manner (Jacobson, 1995). Techniques such as interviews, questionnaires, case studies, focus groups, workshops, and document analysis generate the information quickly and can include individuals from a wide range of backgrounds in the needs assessment process (Jacobson, 1995).

C. Rapid Assessment Models for Needs Assessment

Using techniques from PRA and RRA methods, Jacobson (1997) devised a technique called Rapid Assessment for Conservation Education (RACE) to use in performing an environmental education needs assessment study in the Bay Islands of Honduras. The goals of RACE were to “provide a framework to identify immediate and long-term conservation education needs in a community or a region, to recommend subsequent actions, and to be useful to audiences ranging from international agency staff to community organization personnel” (Jacobson, 1997).

As in PRA and RRA methods, RACE relied heavily on the involvement of local organizations, agencies, and individuals to identify conservation problems and the design and planning of programs (Jacobson, 1997). The participants included a broad spectrum gleaned from both the formal and non-formal educational sectors. Formal educational sector

representatives included education agencies, school administrators, teachers, students, parents, and extrainstitutional organizations. The non-formal sector participants included resource management agencies, environmental and non-governmental organizations, municipal and business leaders, resource users, and local industries (Jacobson, 1997).

Methods used in the RACE study included qualitative and quantitative data gathering. Personal interviews compiled information on environmental education program planning, implementation, and outcome. Surveys of visitors to the Bay Islands identified the needs and knowledge levels of tourists. Observation, program content analysis, workshops, focus groups, public meetings and conferences provided additional information on environmental education needs in the Bay Islands (Jacobson, 1997).

Similar methodology was used in a local park interpretation needs assessment study in Tikal National Park, Guatemala. The objectives of the study were to identify and understand the target audience, determine constraints and resources, and delineate priority issues to interpret. The information was gathered using community workshops, oral surveys, interviews, and review of similar programs in other areas (Jacobson, 1995).

Jacobson's needs assessment techniques, combined with those of PRA and RRA, provide the basis for this study. Using a multi-method approach provided thorough, in-depth information within a short time frame. Inclusion of local citizens in the information gathering and decision making process allowed for greater ownership of the study results and provided encouragement for using the information in a locally-meaningful manner (Jacobson, 1995).

IV. Summary of Review of Related Literature

The field of environmental education has been quickly developing since the 1970s on local, national, and international levels. Although effective actions must begin and be carried out on community-based levels, it is also imperative that the internationality of environmental education is recognized. A global perspective is necessary to guide the world's citizens in a united effort to protect, preserve, and recover the natural environment.

With this global perspective in mind, each country, and each region within a country, must define its own role and goals within the framework. In Nicaragua, environmental education is a developing field supported by national and local government and non-governmental organizations. National environmental education organizations recognize the importance of community level work and encourage each department within the country to create its own plan that fits closely with the national program.

The environmental education commission of the Carazo department of Nicaragua includes representatives from various organizations, drawn together by their interest in preserving Carazo's environment. The commission is working to define the most critical environmental problems facing the department and to devise action strategies to deal with these issues. However, to successfully define the problems and generate a strategic plan for environmental education, it is necessary to perform a needs assessment study to determine the baseline data from which the plan will be developed.

Needs assessment studies for environmental education supply information on the current state of environmental education within a determined area. Combining participatory development and rapid assessment approaches allows the researcher to gather details from various organizations and individuals involved with environmental education. The information from different sources, such as interviews, surveys, literature reviews, and observation provides methodological triangulation providing a "check" on the verity of the information gathered. Using these combined methods in environmental education needs assessments assisted in painting a complete picture of environmental education in Carazo.

CHAPTER THREE: RESEARCH METHODS

The purpose of this study was to identify environmental education (EE) needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in the Carazo Department of Nicaragua. These four areas were specifically addressed by the researcher using a variety of data collection tools.

The majority of the data collection for this rapid needs assessment study took place from August 15 to September 8, 1997 and January 13 to 21, 1998. The principal researcher and a research assistant/translator gathered data during these periods from a variety of government and non-governmental sources involved in natural resource management within Nicaragua and Carazo.

The study methodology was based closely on the RACE methodology, which used a combination of data gathering techniques, many derived from Participatory Rural Appraisal (PRA) and ecological assessment methods. RACE methods include personal interviews, quantitative and qualitative surveys, focus groups, and materials evaluation (Jacobson, 1997). These multiple methods add to the validity of the information gathered, creating triangulation between information gathered and providing a check for the other. This chapter outlines each of the methods and data collection tools used in this needs assessment study in the following manner:

- I. Subjects Included in Study
 - A. National Level Officials
 - B. Departmental Level Officials
 - C. Municipal Level Officials
 - D. School Level Representatives

- II. Data Collection Methods Used
 - A. Personal Interviews
 - B. Teacher Surveys
 - C. Review of Written Materials
 - D. Focus Groups

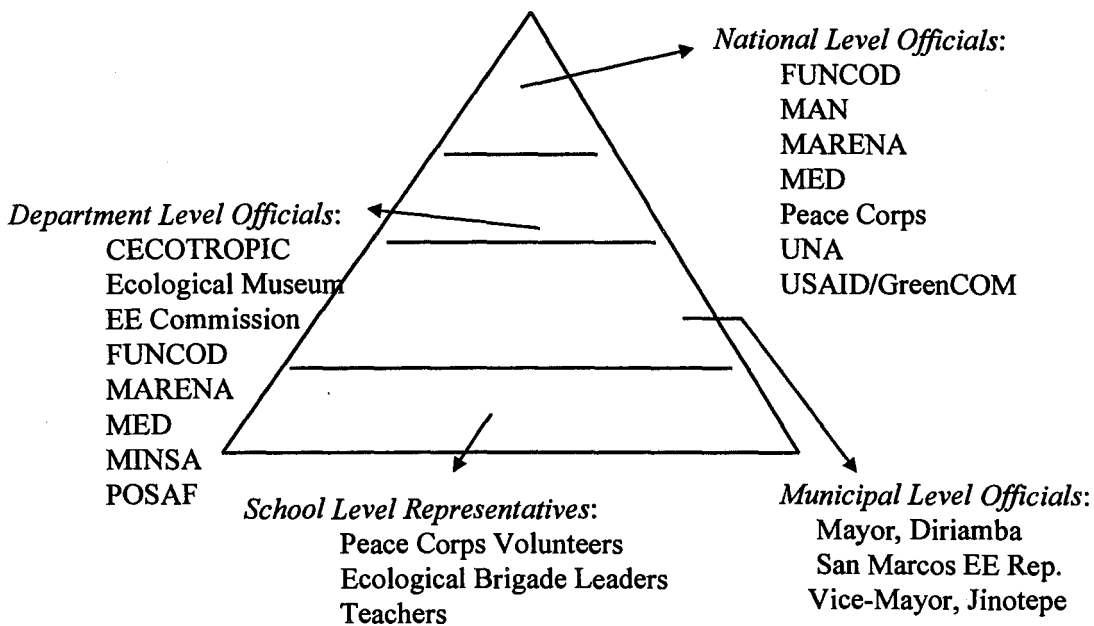
- III. Treatment of Data
 - A. Personal Interview Data Analysis
 - B. Teacher Survey Data Analysis

- C. Written Material Analysis
- D. Focus Group Information Analysis

I. Subjects Included in the Study

This study attempted to gather information regarding the state of environmental education in Carazo while putting it in a broader context of the state of environmental education in Nicaragua in general. Because of this, the subjects included in the study ranged from national level officials to department, municipal, and school level officials. (Figure 3-1.)

Figure 3-1: Individuals/Organizations Included in Study



A. National Level Officials

Interviews and meetings were held with national level personnel in government ministries and non-governmental organizations (NGOs) who deal with environmental education legislation or programming. The initial organizations and government ministries contacted were identified through discussions with Silvio Echaverry, Carazo's Ministry of Natural Resources and the Environment (MARENA) delegate; Vonda Brown, an environmental education Peace Corps volunteer who worked in Carazo from 1995 to 1998; Companeros Nicaragua-Wisconsin (CNW) personnel; and a review of Nicaraguan environmental education literature. As the interviews progressed, various other agencies, ministries, and organizations were suggested as possible contacts for further information on the state of environmental education in Nicaragua.

The organizations listed in this section are presented in the following order: Nicaraguan government agencies, non-Nicaraguan government agencies, Nicaraguan and non-Nicaraguan non-governmental organizations (NGOs). Within each category, the organizations are listed alphabetically.

1. Nicaraguan National Level Government Agencies/Organizations

a) MARENA

The Ministry of Natural Resources and the Environment (MARENA, or Ministerio del Ambiente y Recursos Naturales) is the ministry that administers laws and regulations dealing with the use of natural resources in Nicaragua (Echaverry, 1997). MARENA's environmental education group consists of seven people including a Canadian and Nicaraguan consultant who are assisting on a limited-term basis. The head environmental education specialist, Vicky Belli, was included as interview subject for this study. Also interviewed was the Territorial Director of MARENA, Miguel Reyes, as he functions as the human resources manager for the ministry and has knowledge of environmental education activities taking place in each of the departments.

b) MED

The Ministry of Education (Ministerio del Educacion, or MED) mandates which subjects are included in the public and private school curricula. MED also provide guidelines for teacher training requirements (both in-service and pre-service), student community service requirements, and teaching materials used in the classroom. The national level MED employee who specializes in environmental education, Maritza Granados, was interviewed for this study.

c) MINSAL

As health and environmental quality issues are inextricably linked, the Ministry of Health (MINSAL, or Ministerio de Salud) was included as a participant in this study. Especially in developing countries, such as Nicaragua, many health problems can be directly linked to environmental problems such as poor air quality, poor water quality, and improper waste management techniques (Sanchez, 1997). Unfortunately, the national level health education director, who also deals with environmental education issues, was not available to be interviewed.

c) UNA

The National Agrarian University (UNA, or Universidad Nacional Agraria) houses a department of Natural Resources and the Environment. Interviewed for this study was the vice-dean of this department, Domingo Rivas.

2. Non-Nicaraguan Government Agencies/Organizations

a) Peace Corps

Peace Corps is a program of the United States Government. Peace Corps volunteers in Nicaragua work in the areas of environmental education, health, and business. The environmental education sector of the Peace Corps in Nicaragua has only been in place since 1994 and has quickly grown to be its largest sector with the greatest number of volunteers working in this area. The associate coordinator of volunteers for the environmental program, Maria Antonio Mallona, was interviewed for this study.

b) US AID/GreenCOM

GreenCOM is a consulting firm that conducts field work and applied research at the request of the United States Agency for International Development (USAID) Missions and Bureaus. The organization focuses on environmental education and environmental communication projects in developing countries. A two year project dealing with protected areas management and training of national park interpreters was begun in 1996. The project director, Nina Chambers, and a University of Idaho researcher connected with the GreenCOM program, Rob Whipple, were interviewed.

3. Nicaraguan and Foreign Non-Governmental Organizations (NGOs)

a) FUNCOD

The Nicaraguan Foundation for Conservation and Development (FUNCOD or Fundacion Nicaraguense Para la Conservacion y el Desarrollo), an NGO, focuses on the protection of Nicaragua's natural resources and promotes sustainable development. It works with various social and business sectors to increase awareness of the importance of integrating a strong, healthy economy with sustainable management of natural resources and environmental

protection (FUNCOD Brochure, n.d.). Included in the interview process was a national level FUNCOD assistant director/consultant, Jorge Cisneros.

b) MAN

The Movimiento Ambientalista Nicaraguense (MAN), or the Nicaraguan Environmental Movement, is an NGO dedicated to environmental lobbying and education efforts (Fuentes, 1997). The national director of environmental education for MAN, Indiana Fuentes, was interviewed for this study.

B. Department Level Officials

Interviews and meetings were held with departmental level personnel in government ministries and non-governmental organizations (NGOs) who deal with environmental education in Carazo or are local representatives of organizations/agencies interviewed at the national level. The initial organizations and government ministries contacted were identified through discussions with Silvio Echaverry, Carazo's MARENA delegate, and Vonda Brown, an environmental education Peace Corps volunteer who worked in Carazo from 1995 to 1998. As the interviews progressed, various other agencies, ministries, and organizations were suggested as possible contacts for further information on the state of environmental education in Carazo.

The organizations listed in this section are presented in the following order: Nicaraguan government agencies, non-Nicaraguan government agencies, Nicaraguan and non-Nicaraguan non-governmental organizations (NGOs). Within each category, the organizations are listed alphabetically.

1. Nicaraguan Governmental Agencies/Organizations

a) MARENA

MARENA is the ministry that administers laws and regulations dealing with the use of natural resources in Nicaragua. Each department has a MARENA representative who oversees activities relating to natural resource management within the department. The Carazo MARENA office has a delegate (director) and four technicians who provide permits and enforce regulations for harvesting trees, and provide educational seminars on the use of pesticides and other resource management activities. The MARENA delegate of Carazo, Silvio Echaverry, was interviewed for this study.

b) MED

The Ministry of Education (MED) mandates which subjects are included in the public and private school curricula. They also provide guidelines for teacher training requirements (both in-service and pre-service), student community service requirements, and teaching materials used in the classroom. The department level delegate oversees public and private education on a regional level and the municipal MED representatives answer to her. The Carazo delegate, Fanny Vasquez, and assistant delegate, Dermen Zepea, were interviewed.

The Carazo MED office provided the researcher with a list of all of the schools in Carazo. The list included information on whether the school was public or private, single sex or co-educational, rural or urban, diurnal or nocturnal, elementary or secondary, and the number of students. (See Appendix C.)

c) MINSA

On a local level, the Ministerio de Salud, Ministry of Health (MINSA), is heavily involved with health and environmental education. An important issue being addressed on the local level is air and water pollution resulting from several large factories in Carazo. The director of the research and education program dealing with this issue, Reyna Sanchez, was interviewed.

2. Nicaraguan and Foreign Non-Governmental Organizations (NGOs)

a) Carazo Environmental Education Commission

The department of Carazo formed a Commission for Environmental Education after a meeting of the National Commission for Environmental Education in 1996. The National Commission recognized a need for each department to have its own commission to regulate and support environmental education on a regional level. The Carazo environmental education commission works to identify the environmental problems facing Carazo and develop plans to deal with these issues. The secretary of Carazo's environmental education commission, Humberto Campos, was interviewed as he holds all of the official and unofficial documents relating to environmental education in Carazo and has attended all meetings of the commission.

Other commission members who were interviewed included the Mayor of Diriamba, Plinio Silva; the Vice-Mayor of Jinotepe, Juan Navarez; and the representative from San Marcos,

Roberto Fernandez. Carazo's MARENA delegate, Silvio Echaverry, is also a member of the commission and was interviewed. (See description under section B-1-a.)

b) CECOTROPIC

The Center for Tropical Eco-Development Studies (El Centro de Estudios de Ecodesarrollo para el Tropico, or CECOTROPIC) is a private, nonprofit association that provides environmental and sustainable development training through scientific and technical seminars, workshops, and courses. CECOTROPIC also provides environmental and agricultural education through a weekly radio show broadcast from Managua. CECOTROPIC's assistant director was interviewed for this study. The assistant director, Humberto Campos, also acts as the secretary for the Carazo Environmental Education Commission. (See section B-2-a.)

c) Ecological Museum of Tropical Dry Forests

The Ecological Museum of Tropical Dry Forests is located in Diriamba. It is funded through the Carazo Association for Community Development (Asociacion para el Desarrollo Comunitario de Carazo, or ADECA). The exhibits in the museum focus on the flora and fauna of tropical dry forests, the original forest cover type in Carazo. The museum has a full-time paid director, a paid custodian, and several volunteer workers who assist with education programs. The director, Ivania Cardenas, was interviewed for this study.

d) FUNCOD

The Nicaraguan Foundation for Conservation and Development (Fundacion Nicaraguense para la Conservacion y el Desarrollo or FUNCOD), an NGO, focuses on the protection of Nicaragua's natural resources and promotes sustainable development. It works with various social and business sectors to make them aware of the importance of integrating a strong, healthy economy with sustainable management of natural resources and environmental protection (FUNCOD Brochure, n.d.). FUNCOD has volunteer representatives in each department of Nicaragua who work on local level projects. The Carazo FUNCOD representative, Isolda Coca, was interviewed.

e) POSAF

The Socio-Environmental and Forest Development Program (Programa Socioambiental y de Desarrollo Forestal or POSAF) is a national NGO that studies environmental problems facing Nicaragua as well as the socioeconomic effects of these problems, especially on the poor. POSAF has regional programs focused on specific problems in eight areas around the country. One of the pilot study sites is the Rio Grande watershed in Carazo. POSAF's Carazo representative, Fidel LaNuza, was interviewed for this study.

C. Municipal Level Officials

Interviews and meetings were held with municipal level personnel which focused on the Carazo Environmental Education Commission (see Appendix A) representatives from each of the four major towns, Jinotepe, Diriamba, San Marcos and Santa Teresa. The initial contacts were identified through Silvio Echaverry, Carazo's MARENA delegate, and Vonda Brown, an environmental education Peace Corps volunteer who worked in Carazo from 1995 to 1998. As the interviews progressed, various commission representatives were suggested as possible contacts for information on the state of environmental education in each of the municipalities. Within this section, organizations are arranged alphabetically by municipality.

1. Diriamba Environmental Education Commission Representative

The Carazo Environmental Education Commission is made up of representatives from the four major municipalities in the department. The committee representative from Diriamba is the mayor, Plinio Silva. He responded in writing to the interview questions.

2. Jinotepe Environmental Education Commission Representative

The representative from Jinotepe is the vice-mayor, Juan Navarez. He was interviewed for the study.

3. San Marcos Environmental Education Commission Representative

The mayor of San Marcos appointed a science teacher at the local high school, Juan XXIII, to be the environmental education commission representative from San Marcos. The representative then reports back to the mayor, vice-mayor, and city council on the outcome from

the commission meetings. The San Marcos representative, Roberto Fernandez, was interviewed for this study.

4. Santa Teresa Environmental Education Commission Representative

The mayor of Santa Teresa is the environmental education commission representative from the municipality. Unfortunately, he was not available to be interviewed.

D. School Level Representatives

Interviews and meetings were held with school level representatives. The initial individuals contacted were identified through discussions with Silvio Echaverry, Carazo's MARENA delegate, and Vonda Brown, an environmental education Peace Corps volunteer who worked in Carazo from 1995 to 1998. The schools surveyed were chosen using a stratified random sample method. As the interviews and surveys progressed, various other schools and individuals were suggested as possible contacts for further information on the state of environmental education in Carazo's schools. Within this section organizations/individuals are arranged alphabetically.

1. Ecological Brigade Leader (Formal School System)

Many schools in Nicaragua have student environmental clubs called "Ecological Brigades." These brigades are directed by a teacher and work on community projects and special events dealing with environmental education and environmental issues. One brigade leader within Carazo was consistently identified as being especially active. This brigade leader from Diriamba, Emelitina Perez Vado, was interviewed.

2. Peace Corps Volunteers

Peace Corps volunteers working in the schools and communities in Carazo were interviewed. Two of the volunteers, Laura Beasley and Jenn Blakeman, are working directly with teachers in schools. The other volunteer, Vonda Brown, worked at both the Diriamba mayor's office and the Carazo Department MARENA office. All three volunteers provided workshops and environmental demonstrations (such as how to construct and use solar cookers, how to properly dispose of waste water, and so on) to communities in the area.

3. Teachers

Teachers in 20 Carazo schools were asked to fill out an environmental education survey. The schools were selected using a stratified random sample. There are 191 schools in Carazo with approximately 1,000 teachers and an 8% sample of teachers was selected. (See Table 3-1.) The strata were divided as follows:

- a. urban, public, primary schools
- b. urban, private, primary schools
- c. urban, public, secondary schools
- d. urban, private, secondary schools
- e. rural, public, primary schools
- f. rural, public, secondary schools
- g. urban, private, primary and secondary schools
- h. rural, public, primary and secondary schools
- i. urban, public, primary and secondary schools
- j. rural, private, primary schools

Table 3-1: Schools Chosen for Teacher Survey by Stratified Random Sample

Code	School Type	% of Total Surveyed	# Schools Surveyed	# Teachers Surveyed	Name and Location of Schools Surveyed
A	urban, public, primary	13%	2	11	Juan Jose Rodriguez, Diriamba 19 de Julio, Diriamba
B	urban, private, primary	10%	2	9	La Palmera, Diriamba San Antonio, Jinotepe
C	urban, public, secondary	6%	1	5	Instituto El Pueblo, Jinotepe
D	urban, private, secondary	2%	1	5	Divino Pastor, Diriamba
E	rural, public, primary	60%	11	36	Rigoberto Lopez Perez, El Rosario Cruz de Guadeloupe, Jinotepe Ruben Dario, Jinotepe Republica de Cuba, San Marcos Cesar A. Calderon Flores, Santa Teresa El Encierro/Las Piedrecilas, La Conquista Mario Rioux, San Marcos La Boquita, Diriamba El Madrono, La Conquista Canas Blancas No. 2, El Rosario Luis A. Garcia, San Marcos
F	rural, public, secondary	2%	1	3	Instituto Jonathan Gonzales, La Paz
G	urban, private, primary and secondary	3%	1	6	Adventista, Jinotepe
H	rural, public, primary and secondary	3%	1	2	Pedro Joaquin Chamorro, Diriamba
I	urban, public, primary and secondary	1%	1	5	Arien Siu Bermudez, El Rosario
J	rural, private, primary	0.5%	1	3	Corazon de Maria, Santa Teresa

The information on the type (rural/urban, public/private, primary/secondary) was provided through the Carazo MED office. (See Appendix C.) The schools were then divided up according to the 10 strata. After percentages of each type were calculated, the correct number of schools of each type was calculated and individual schools were randomly selected.

Of the school types that represented less than 5% of the total (types D, F, G, H, I, and J), only one per type were surveyed. This is because these six types represent such a small percentage of the total population that the information gathered from them was deemed to be insignificant in comparison with other more common types.

Within each school, five was the maximum number of teachers surveyed. At schools in which there were a large number of teachers, the principal or head administrator was asked to select five who would be available to complete the survey. At schools in which there were less than five teachers (often there is only one or two teachers at the type E, rural/public/primary, schools), all teachers who were present were asked to fill out the survey. (See Table 3-1.)

There are approximately 1,000 teachers in the Carazo department. However, for several reasons, it was decided that the school should be the unit of focus, not the individual teacher. First of all, logistically it would have been extremely difficult to survey 100 teachers at 100 different schools. Transportation in Carazo is efficient within the cities but the majority of the schools in Carazo (60%) are in rural locations, many of which are several hours walk from the nearest accessible public transportation. Additionally, it was assumed that teachers at the same school work from the same mandated curricula, work under the same administrator, and have access to the same in-service training.

To obtain permission to survey teachers, it was necessary to meet with the MED representative, Fanny Vasquez, of the Carazo department to present a letter of introduction from Silvio Echaverry, Carazo's MARENA delegate, and explain the study. After receiving a letter of approval/introduction from the Carazo MED office, it was necessary to obtain a seal of approval from each of the municipal MED offices, Diriamba, Jinotepe, San Marcos, and Santa Teresa. (See Appendix D.) For details on the survey procedure, see section III-B.

II. Data Collection Methods Used in this Study

This study used triangulation in methodology, which means that numerous data collection methods were used to ensure greater validity. In gathering data using a variety of sampling strategies, the theories, assumptions, and, eventually, analysis of the information were

tested in more than one way (Leedy, 1993). Because of this combination of methods, each method will be discussed separately as will analysis of data resulting from each of the data collection techniques.

A. Personal Interviews

Personal interviews were conducted with each of the subjects discussed in Part I of this chapter, *Subjects Included in Study*, with the exception of the "Teacher" group (I-D-5). The teachers were surveyed using the methods outlined in Section II-B. Each individual interviewed was asked questions specifically tailored to her/his organization, position and prior knowledge of environmental education. Sample interview questions are provided in Appendix E.

1. Pre-interview Preparations by Researcher

In preparing questions for the personal interviews, the subproblems of the study were reviewed. The first subproblem was to identify environmental education needs within Carazo as indicated by individuals as well as local and national government and non-governmental organizations. Needs were studied in the context of which environmental problems and issues needed to be addressed through environmental education programs and strategic plans in Carazo. One of the first questions in the interviews addressed this subject specifically. Subjects were asked, "What do you perceive to be the most critical environmental problems facing Carazo that can be addressed through environmental education?"

The second subproblem was to compile information on the design and perceived success of environmental education programs currently underway in Carazo. The questions relating to this subproblem varied depending on the subject being interviewed. For example, individuals working for organizations known to be involved in environmental education were asked what kind of environmental education programs their organization/agency offered. If the individual being interviewed was directly involved with the program, s/he was asked how successful s/he thought the organization's programs were and how s/he thought they could be improved. Additionally, if the interview subject mentioned environmental education programs offered by other organizations, s/he was asked to comment on the perceived success of the mentioned program. This provided a cross-check between reported success by the parent organization and perceived success of outside sources.

Organizations/agencies without specifically identified environmental education programs were asked to identify organizations/agencies they thought were providing environmental education training and their perceived success of those programs. The subjects were also asked if their organization had provided environmental education training, programs, and resources. If so, they were asked to explain what resources were available. If no resources were available through their organization, they were asked whether any were currently under development.

The subjects were generally contacted at least two weeks prior to the interview date to arrange an appointment. They were provided with a letter (either by fax, mail, or e-mail) that described the interview procedure and a list of questions that would be asked during the interview. (See Appendix E.) The participants were asked to review the questions before the interview. They were advised that the order of the questions might vary and that some of the questions might be omitted depending upon time constraints or the thoroughness of previous answers. The subjects were informed that, if they had any questions or concerns regarding the purpose of the study, the researcher would be available to answer them before beginning the formal interview process. The time, date, and location of the interview appointments were reconfirmed one day in advance through telephone contact.

2. Methods of Conducting the Actual Interview

The researcher and translator worked together to perform the interviews which generally lasted from one to two hours (minimum 50 minutes, maximum four hours). For validity reasons, only the researcher, impartial translator (not a formal representative of any government or non-governmental organization), and interview subject were in the room at the time of the interview. It was feared that other individuals outside of these three might influence the answers of the subject.

The interviews were audio taped so that the researcher could focus all energy on the subject and answers without the distraction of taking notes during the interview. Afterward, the interviews were transcribed and, when necessary, translated.

The primary translator, Vonda Brown, was a Peace Corps volunteer who worked in Carazo from 1995 to 1998. Although her official position was as a Peace Corps volunteer, during her time as research assistant, she was just ending her position with the Peace Corps. Her initial language training was provided through the Peace Corps and she used Spanish

consistently during her three year stay in Nicaragua. The translations provided during the interviews were intended as cursory guides to allow the researcher to formulate additional questions or redirect answers. More formal translations of the interviews were done when the transcripts were typed. During this period, Brown was assisted by Clodaldo Coca, a Nicaraguan research assistant.

Before beginning the interview itself, the researcher explained the objectives of the study and the manner in which the results would be used. The researcher then asked the subject if s/he had any questions regarding the study or the type of information the research intended to gather.

During the interview, the questions previously provided to the interview subjects were used as guides although many of the questions were derivatives rather than the original ones. The specific questions were phrased naturally, often following the pattern of conversation. However, if the discussion strayed too far from the original intent of the interview, the questions given as guidelines were used to gently redirect the interview back toward the original research objectives.

Upon conclusion of the interview, the subject was asked whether s/he had any other comments s/he would like to add or if there were any topics on which s/he would like to speak about which the researcher had not specifically asked her/him. The researcher then explained that a transcription of the interview would be sent to the subject within the next two to three weeks. The subject was instructed to make any changes or additions to the transcripts and then sign them indicating that s/he gave her/his permission to the researcher to use the results from the interview in the final study. The researcher informed the subjects that, if the transcripts had not been returned to the researcher within three months, it would be assumed that the information contained therein was accurate and approved by the subject. Also explained was that the results from all of the interviews and surveys would be compiled in a publication of which a copy would be sent to each of the study participants upon completion of the study analysis.

3. Post-interview Methods

Immediately following the interviews, the cassette tape recordings of the interview sessions were transcribed. (See Appendix F for sample interview transcriptions.) For the interviews conducted in English, the researcher transcribed the interviews. For the interviews conducted in Spanish, the researcher typed the translations provided by the translator during the

interviews themselves. The Spanish transcriptions were typed by the translator/research assistant within the month following the interview, and these full transcriptions were eventually translated into English.

The transcriptions were either mailed, faxed, or e-mailed to the interview subjects. The cover letter explained that the transcriptions were not word-for-word but rather condensations of the information provided. Whenever possible, the exact words used by the interview subject were included in the transcription. The subject was asked to make any changes or additions to the notes in areas where the original information may have been unclear or misleading. After making changes, the subject was asked to sign the transcriptions to give the researcher permission to use the information in this study. (See Appendix F.)

The researcher provided the interview subjects with a self-addressed, stamped envelope to return the amended and signed transcriptions to the researcher. The interview subjects were also provided with contact information for the researcher in Nicaragua and in Wisconsin should any questions or concerns arise.

B. Teacher Surveys

There are approximately 1,000 teachers in 191 schools in Carazo. This large audience provided an indication that more accurate and reliable information could be gathered from teachers using a written survey method than by attempting to conduct personal surveys with a representative sample. Additionally, the amount of time available to teachers to participate in a one to two hour interview is quite limited. The salaries paid to Nicaraguan teachers are minimal and many of them have long commutes to school each way, often one to two hours each way by foot, bicycle, or horse. Taking these factors into account, it was decided that the best way to gauge teachers' attitudes toward and knowledge about environmental education was through a written survey.

1. Teacher Survey Development

The teacher survey was developed based directly on two and indirectly on one of the four subproblems of the research project. The two on which the survey specifically focused were the first and third subproblems. The first subproblem was to identify environmental education needs within Carazo as indicated by individuals as well as local and national government and non-governmental organizations. The third subproblem, compiling information on existing

resources for environmental education in Carazo, was also specifically addressed through the survey. Information on the second subproblem, what environmental education programs are currently underway in Carazo and what is their perceived success, was indirectly addressed through several questions. The information gathered from these three subproblems was combined to address the fourth which was to recommend environmental education actions for use in Carazo based on the findings regarding needs, programs, and available resources.

The survey was divided into and will be discussed in the following sections: Environmental Education, Teacher Education, Student and Classroom Resources Information. (See Appendix G.)

a) Environmental Education

The environmental education section of the teacher survey gathered information on the first three subproblems. Subproblem one, defining environmental education needs in Carazo, was addressed through questions such as, "The following list of environmental problems has been compiled by groups of teachers, students, NGOs, government agencies and environmental education specialists. Please choose the problem that you consider to be the most critical." The teachers were also asked to provide their definition of environmental education and indicate what kind of training they had received in the subject.

The second subproblem, which dealt with environmental education programs currently underway, was indirectly addressed through several questions. In question number three, information was gathered on whether the teachers were currently including teaching about the environment in their classes, and if so in what manner. This two-part question provided the researcher with an indication of environmental teaching currently underway through the formal school system. Question number three asked whether the teachers had ever received training specifically focused on environmental education. (This provided information on in-service or pre-service environmental education teacher training programs in Carazo.)

The third subproblem compiled information on environmental education resources available in Carazo. Within the teacher survey, the research looked at which resources the teacher was aware of that s/he had available. The question that specifically addressed this subproblem was, "Please mark the resources that you have available to you for teaching about the environment." The teacher was then provided with a list of 17 choices of types of environmental education resources.

b) Teacher Education

The teacher education section asked questions about training received to become a teacher, what levels of school had been completed. The survey asked the teacher to state whether or not s/he had received any in-service training during his/her teaching career. If so, s/he was asked to describe the subjects on which the in-service training had been focused and to include the name of the organization/agency that provided the training.

c) Information on Students and Classroom Resources

This section asked about the class sizes, amount of time students spend in class, if any assistants help the teacher, and what subject(s) were taught by the teacher. (Unfortunately, this part of the survey was only administered to the first half of the survey respondents because of technical difficulties with the facsimile machine that was used to send the surveys to the research assistant.)

2. Survey Validity

The first draft of the teacher survey, created by following the study subproblems one and three, was reviewed by a five-member validity panel consisting of environmental educators, evaluation experts, curriculum developers, survey designers, and educators with international experience. (See Appendix H for list of Teacher Survey Validity Panel members.) The reviewers received a letter providing information on the background, objectives, and expected outcomes of the study. (See Appendix I.) Each reviewer was then asked to make comments and suggestions as to how the survey could be improved with regard to measurement of the information sought through use of the instrument.

A pilot of the instrument was not performed because of temporal and logistical constraints. The majority of the research was conducted during a three week period in August of 1997. Because of the limited amount of time available to the researcher and the logistical difficulties in reaching many of the schools surveyed, a pilot of the instrument was not feasible. (Many of the schools are located several miles from the nearest town or the nearest mode of public transportation. As the researcher and assistant were reliant on public transportation, it was often difficult to reach the intended school site.) Because of this limitation, the suggestions made by the validity panel were carefully taken into consideration and the teacher survey

instrument was discussed with two individuals in Nicaragua, both of whom work in environmental education and one of whom has worked closely with teachers.

3. Instrument Revisions

In light of suggestions from several panel members, it was decided that as many of the answers as possible should be organized to allow for machine scoring. The necessity of translating each of the surveys before performing an analysis added a significant step above and beyond the initial difficulty and time-consuming nature of compiling survey results. Therefore, whenever possible, questions were phrased so that the respondent could choose one in a series of answers that could then be translated into a numeric code for analysis using a computerized statistical package.

Another suggestion incorporated into the survey was that as many answers as possible should be multiple choice, once again, for greater ease in analysis. Several of the reviewers expressed concern that ranked answers (For example, "Choose the top three environmental problems you think are the most critical in Nicaragua.") are very difficult to analyze. If each person only chooses her/his number one answer, the answers will naturally fall out by ranking and this simplifies the analysis process.

In the question regarding teachers' access to environmental education resources, it was suggested that the respondents be provided with a list of possible resources to which they may have access, as per Dixon (1998). Resource choices included a checklist of 18 items plus an "other" category to help remind teachers of available resources and aid the researcher in more efficient data analysis. Using this format, the researcher was able to point out to respondents that there might be resources available of which s/he wasn't aware.

One validity panel member expressed concern that the study didn't specifically address the attitudes of teachers regarding environmental education and their willingness to teach the subject. She suggested that a question be added such as, "Do you feel environmental education is important? Why or why not?" or "Are you willing to teach about the environment? Why or why not?" This suggestion was incorporated into the final survey but a "check" was also included as it was felt that all teachers, knowing that this was an environmental education survey sponsored by the Ministry of Education and Ministry of Natural Resources and the Environment, would initially answer that they felt it was important to teach about the environment. The balancing question asked was, "Do you feel it is important to teach about the environment? (Yes

or No.) Please explain why or why not.” The next question was, “Have you included teaching about the environment in your class? (Yes or No.) If you have included it, please describe in what manner.” (See Appendix J for draft survey. See Appendix G for final survey in English and Spanish.)

Another change made in the final draft of the survey was to place the demographic questions at the end and the environmental education-related questions at the beginning. The reason for this change was that the environmental education questions (or any type of question directly related to the study) immediately engage the interest of the survey respondent and help her/him understand what kind of information is being sought (Wilson, 1996).

4. Administering the Survey

The teacher survey was given to a group of Carazo teachers at schools chosen through a stratified random sampling method. (See Section I-D-5 in this chapter.) The total number of teachers to whom the survey was administered was 83 teachers in 22 different schools.

Permission was obtained from various levels of the Ministry of Education to administer the survey. First, the schools to be included in the sample were selected by stratified random sample. The listing of the schools along with the data to be used for stratification was obtained through the Carazo MED office. A copy of the survey was then taken to the Carazo MED representative for review and approval. A letter of support and introduction was provided by the Carazo MED delegate on which the representatives from each of the four major municipalities (Diriamba, Jinotepe, San Marcos, and Santa Teresa) placed an official stamp indicating their approval and support. (See Appendix D.)

When visiting each of the schools sampled, the researcher and assistant first met with the school's principal or director to explain the study, presented the letter of support from MED, and asked which teachers would be available to complete the survey. In the larger schools (with five or more teachers), only five teachers were asked to participate in the study. (Although, some places where the school only had six or seven teachers, all of the teachers present participated in the study.) In the smaller schools (with four or fewer teachers), as many teachers as were present were asked to complete the survey.

In a large group setting, the researcher (through the translator) explained to the participating teachers the purpose of the study. Although all four subproblems of the study were mentioned, the three subproblems focused on in the teacher survey were stressed and explained

in detail. These three subproblems included the determination of environmental education needs in the department, the environmental education programs currently underway in the department, and the resources currently available for teaching about the environment. Each teacher was asked to complete the survey while the researcher and assistant were there to answer questions. The surveys were collected immediately upon completion. In exchange for participating in the study, the teachers were provided with a gift as a token of appreciation. The gift consisted of a small notepad, pencil, and a few pieces of candy. The principal/director and teachers were told that they would receive a copy of the findings from the study in the fall of 1998.

During the August 1997 research period, the researcher and translator were able to administer surveys in 11 schools to 46 teachers. In December 1997, the translator, acting as a research assistant, and a Nicaraguan assistant administered the survey at 11 more schools to 37 teachers.

5. Translation of the Surveys

The teacher surveys were designed so that the majority of the answers could easily be given numerical codes to enter into a computerized statistical package for ease of analysis. However, there were seven questions in which teachers were asked to either define, describe, or provide further details on the item. In these instances, it was necessary to translate the Spanish answers to English for analysis.

In October 1997, a translator based out of Stevens Point, Wisconsin, but originally from El Salvador, assisted the researcher in translating the 48 surveys completed at that point. The translations were done orally using a tape recorder. Afterward, the researcher transcribed the translations, adjusting the English grammar to make the answers grammatically correct. Unfortunately, direct translation from Spanish to English is often not parallel as the grammar, vocabulary, and sentence structure are very different in the two languages. The second set of teacher surveys, numbers 47 through 83, were translated in August 1998 by a former Peace Corps volunteer who worked in Chile and a native Spanish speaker from Bolivia.

C. Review of Documents

Although interviews and surveys provide a great deal of current, detailed information from the specific subjects under study, information gathered from existing sources must not be overlooked as a valuable resource. These sources, either written, numerical, or electronic,

provide information on other research undertaken dealing with the same subject, the history of the topic, current programs underway, and more. The information gathered from existing sources can serve as a basis for research conclusions or as a supplement to information gathered by other means (Finnegan, 1996).

Documentary sources, including written data, provided background information for the study, and also functioned as a valuable part of putting the research in context and understanding the history of environmental education in Nicaragua. Both primary and secondary sources were used in this study. Primary sources refer to documents "written by the people directly involved and at a time contemporary or near contemporary with the period being investigated." Secondary documents are "those that discuss the period studied but are brought into being at some time after it or otherwise somewhat removed from the actual events," (Finnegan, 1996).

1. Documentary Sources Reviewed in the Study

Sources reviewed included information on a national, departmental, and municipal level. The documents to be reviewed were identified through talking with the MARENA representative from the Carazo Department, the Peace Corps volunteer functioning as a research assistant, the Peace Corps environmental projects director, and the secretary of the Carazo Environmental Education Commission.

The documents were provided by the Carazo Environmental Education Commission, the Movimiento Ambientalista Nicaraguense (MAN), MARENA's environmental education office, and the Peace Corps office located in Managua. The following sources were studied:

Table 3-2: Primary and Secondary Data Sources Reviewed (Arranged Alphabetically)

Publication/Paper Title (English Translation)	Author/Organization	Date Written (if known)
Approval of the General Environmental and Natural Resources Law	Hector Mairena, MAN Fundacion Arias Para la Paz y el Progreso Humano (Arias Foundation for Peace and Human Progress)	1997
Document on Environmental Education in the Municipality of Santa Teresa: Sub-Commission on Environmental Education	Comision del Medio Ambiente y Recursos Naturales (COMAREN) (Commission on the Environment and Natural Resources), Municipio de Santa Teresa, Carazo, Nicaragua	July 1997
Guide for Determining Methodologies for Environmental Action for the Ecological Service for Secondary Students	Jorge Luis Hernandez Direccion de Educacion Ambiental (DEA) MARENA	April 1997
National Environmental Education Meeting: Our Intergenerational Responsibility or a Way to Increase Awareness	Direccion de Educacion Ambiental (DEA) MARENA	December 1996
Draft Version: Environment Project	Peace Corps/Nicaragua	August 24, 1995
Workshop on the Municipality and the General Environmental and Natural Resources Law	Proyecto Fortalecimiento de la Autonomia Municipal (Project for Strengthening Municipal Autonomy) FAMU/INIFORM-GTZ	June 1997

2. Review of Documentary Sources

Documentary sources can be reviewed on several levels, with various types of information being sought. Factual information can be extracted from documentary sources; however, it is important to be cautious as the overt, or direct, message of the document may not be consistent with the indirect message or the reality of a situation (Finnegan, 1996).

In this study, documentary sources provided the researcher with a historical context for environmental education in Nicaragua. Additionally, the sources indicated what kind of environmental education programs were currently underway and with what level of success these programs were operating. The researcher read the resources, took notes on each of them, and then used these data as a source in and of themselves as well as a check for information received through interviews and teacher surveys.

D. Focus Groups

Focus groups are a technique used to extract information from a group that focuses on a particular issue or problem. Information gathered through the use of focus groups was used in this study, although the focus groups were conducted several months prior to the beginning of the research-gathering phase of the study.

The Carazo Environmental Education Commission conducted focus groups in the spring of 1997. They worked together to define the most critical environmental problems facing Carazo as well as causes and possible solutions to these issues. (See Appendix K.) This focus group information was utilized in the environmental education study.

III. Treatment of the Data

The data for this study were collected in August 1997, with administration of the teacher surveys continuing in December 1997. Data were gathered using a variety of methods such as interviews, surveys, analysis of written materials, and focus groups. These data were then analyzed, one type of information at a time, and synthesized into a report indicating the state of environmental education in Carazo. The data provided information on the subproblems of the study: What are the environmental education needs in Carazo? What programs are underway and what is their perceived success? What resources are currently available for environmental education in Carazo? How can these findings be compiled to provide suggestions for creating a comprehensive environmental education plan in Carazo?

A. Analysis of Data Gathered through Personal Interviews

Personal interviews provided an enormous amount of information to the researcher regarding environmental education in Nicaragua and Carazo, the environmental problems facing the country and region, programs underway, and resources available. To organize the information and to narrow down the relevant versus irrelevant information provided, it was necessary to, once again, clearly define the specific areas in which information was sought. To quote Wolcott (1990), "The major challenge we face in qualitative inquiry is not to get data, but to get rid of it!"

The personal interviews were used to address the first three subproblems of the research: (1) What are perceived to be the most critical environmental problems facing Carazo that can be addressed through environmental education? (2) What environmental education programs are

currently underway in Carazo and how successful are they perceived to be? (3) What resources for environmental education are available in Carazo?

1. Defining the Topics Under Each Subproblem through Coding

Under each of the three subproblems addressed, interview questions were asked to best draw out the relevant information from the individual being interviewed. The process differed slightly for each subject as the order and depth of the questions was determined based on information provided through the subjects' answers to previous interview questions.

To analyze and organize the large amounts of data gathered through the personal interviews, the following process was followed: The interviews were recorded on a Sony Walkman tape recorder. Transcripts and notes were taken from the interview tapes and translations from Spanish to English were made, where necessary. All interviews were numbered and these numbers were used from then on to identify each individual to provide relative anonymity to interview subjects in the final report. Each subject was also given a Roman numeral code from I through IX, to identify the subject's organization type. (See Table 3-3.) All interview transcripts were thoroughly read twice by the researcher. From these first two readings, general coding categories were developed.

Table 3-3: Description of Codes Used to Distinguish Organization Type of Interview Subjects

Code Number	Description of Organization	Organizations Included in Code
I	Government, National Level	MARENA, MED
II	Government, Department Level	MARENA, MED, MINSA
III	Government, Municipal Level	Mayors and Vice-Mayors of Municipalities
IV	National Non-governmental Organization	MAN, FUNCOD
V	Local Branch of National Non-governmental Organization	FUNCOD, POSAF, CECOTROPIC
VI	International Government Organization	Peace Corps, GreenCOM
VII	Academic Institution (K-12)	Ecological Brigade Leader
VIII	Academic Institution (University Level)	UNA
IX	Independent Institution	Ecological Museum

The researcher looked for certain words, phrases, patterns, ways of thinking, and events that were repeated by subjects or stood out as remarkable. Coding categories were chosen as words that represented these topics and patterns that became clear as the data were read and reviewed (Bogden and Biklen, 1982). During the first phase of category-generating, as many categories as possible were described and outlined. This allowed the researcher to see features of the data or references within the data that might have been overlooked through a more focused approach (Boulton and Hammersley, 1996). The goal of the initial stage was to give the researcher an idea of the general content and arrangement of the data to provide a clearer idea as to how the data could be arranged for clarity in analysis.

The codes were applied to naturally occurring pieces of data, such as sentences or paragraphs. Miles and Huberman (1984) stress the importance of clearly defining a unit of analysis because broader units complicate the process of applying a succinct and descriptive code. Letters, as opposed to numbers, were used as codes to facilitate immediate understanding of the concept being described by the code. For example, "DEF" was used to signify deforestation, a commonly mentioned environmental problem facing Carazo. Numbers were not used to represent these codes as they are more easily confused with page numbers and do not allow the researcher to quickly return to the original concept behind the code (Miles and Huberman, 1984). A code chart was developed to facilitate the understanding of codes used. The chart includes a brief description of each code as well as a number indicating to which subproblem to code applies. (See Appendix L.)

The first interview question for the majority of the subjects was, "What do you perceive to be the most critical environmental problems facing Carazo that can be addressed through environmental education?" This question specifically addressed subproblem one. Some of the codes developed to be placed under the general heading of "1: Carazo's most critical environmental problems to be addressed through environmental education" included: DEF (deforestation), SW (solid waste or trash), SENS (lack of environmental sensitivity), GRAY (gray waters or "aguas negras"), and SOIL (soil erosion). (See Figure 3-2.)

Each interview included questions that generally addressed subproblem two. If the subject was an employee of an organization that provided (or had the ability to provide) environmental education programming, the question asked was, "What environmental education programs are currently underway through your organization?" If the subject was not a representative of an environmental education provider, s/he was asked, "What environmental

programs are you aware of that are currently underway in Carazo?" Both groups were asked, "How successful do you perceive this/these program(s) to be?" Each program mentioned was coded under the general topic of "2: Environmental programs currently underway in Carazo."

Questions were also asked about the resources available for environmental education in Carazo. If the subject was an employee of an organization that provided (or had the ability to provide) environmental education programming, the question was, "What resources for teaching about the environment does your organization provide? Please include human resources as well as printed or audio visual materials." If the subject was not a representative of an environmental education provider, s/he was asked, "What environmental resources are you aware of that are currently available in Carazo? Please include human resources as well as printed or audio visual materials." The available resources mentioned were coded under one of two categories, "3: Environmental education resources available *to* the subject's organization" or "4: Environmental education resources available *from* the subject's organization."

Figure 3-2: Codes Assigned to Topics Identified in Personal Interviews (Arranged by Relation to Subproblems)

SUBPROBLEM ONE:
Perceived critical environmental problems facing Carazo that can be addressed through environmental education



1: Carazo's Most Critical Environmental Problems that Can Be Addressed through Environmental Education

- AIR Air Pollution
- BD Loss of Biodiversity
- CHEM Chemical Contamination
- DEF Deforestation
- ECON Country's Economic Situation
- EE Lack of EE Programs
- GRAY Gray Water (Agua Negras)
- H2O Water Contamination
- NAT Loss of Native Species
- OVERP Overpopulation
- PERS Lack of Understanding of Connection Between Personal Actions and Environmental Problems
- PEST Pesticide Poisoning
- SENS Lack of Environmental Sensitivity
- SLA Unsanitary Slaughterhouses
- SOIL Soil Erosion
- SW Solid Waste (Trash)
- TOX Toxic Waste Management

10: Greatest Barriers to Teaching Environmental Education in Carazo


- \$ Lack of Funding
- CNG Lack of Willingness to Make Big Change in Current Lifestyle
- COMM Lack of Total Community Involvement
- CONN Lack of Connection of Learning to "Real Life"
- COORD Lack of Coordination Between Formal/Non-formal Sector and Between Government Agencies
- INT Lack of Interest
- KNOW Lack of Knowledge
- ONE One-shot Efforts on the Part of Organizations or Trainers
- PRI Not a Priority at a National Level
- RES Lack of Resources
- RESP Putting Responsibility for Environmental Problems on Others
- SENS Lack of Environmental Sensitivity
- TIME Lack of Time
- TNG Teaching Style in which Educators are Trained at the Normale School
- VERT Vertical Chain-of-Command Structure

11: Factors That Would Best Help to Improve Level of Environmental Education in Formal Setting

- \$ More Funding

(End Suproblem One)

SUBPROBLEM TWO:
Environmental education programs
currently underway in Carazo and
their perceived success



COORD Coordination Between Different
Government Departments (such as
MARENA, MED, MINSA)
EE Person Specifically Focused on EE
NET More Networking Between Schools
PLAN Better Planning and Coordination
PRE Pre-service Teacher Training
TIME More Planning Time for Teachers
TNG In-service Teacher Training

**2: Environmental Education Programs
Currently Underway in Carazo**

BRIG Ecological Brigade
CAM Campaign
CBRIG Community Ecological Brigade
CMS Environmental Education Commission
COMP Composting Education
CONF National-level Conference
CURR Curriculum Guide
ECO 60 Mandated Hours of Ecological
Service (High School)
GINT Interpretive Guide
INST Institutional Strategy
INT Interpretive Training
K12 K-12 School Program
MUS Museum Education Program
NATL National Strategy
PAR Parade
PK Visit to National Park or Interpretive
Program at National Park or Natural
Area
RAD Radio Program
REC Recycling Education Program
REF Reforestation Program
SCH Clean-up/Improvement on School
Grounds
SOL Solar Oven Building/Training
STU Study
SW Solid Waste Management Education
Program
TEC Technical Assistance Program
TNG Interpretive Training in Parks
TRAS Trash Clean-up (Not on School
Grounds)
TREE Tree Nursery
TTNG Teacher Training
UNIV University-level Program
XC Extra-curricular Activities

**6: Problems with Environmental Education
Programs Currently Underway**

\$ Lack of Funding
CNG Project Demands Big Change from
Participants' Current Lifestyle
COMM Lack of Communication and
Coordination Between
Projects/Organizations

(Subproblem Two Continued)

CONN Lack of Connection of Learning to
"Real Life" or Community
COORD Lack of Internal Coordination (Within
Project)
COUN Lack of Appropriate Counterpart for
Foreign Project
EE Lack of One Person Specifically
Focused on EE
FOL Lack of Follow-up, Follow-through
after Program
FOR Foreigners Start or Work On Project
then Leave
INT Lack of Interest (Participants)
KNOW Lack of Knowledge on the Part of
Project Leaders
LINT Lack of Interest (Leaders)
LTIME Lack of Time (Leaders)
ONE One-shot Projects
PINT Program Itself Isn't Interesting/Locally
Applicable
PLAN Lack of Long-term Plan for Project
SCH Working *only* in School Grounds
TIME Lack of Time (Participants)
TNG Lack of Educator Training

**7: Successes with Environmental Education
Projects Currently Underway**

STU Students are Involved
LOC Local Community Members are
Involved
SCH Work Being Done in Schools (on
Grounds, in Building)
TEACH Successfully Involving Teachers in EE
Projects/Training
COM Work Being Done in the Community
WRK Community Organizing Workshops
\$ Providing Funding for EE

**8: Participants in Environmental Education
Projects Currently Underway**

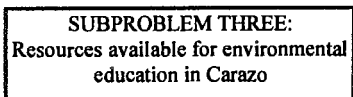
12 Junior High and High School Students
(7th through 12th Grade)
AG Agricultural Producers
COM Community Members
GOVT Government Employees and
Organizations
K Elementary School Students (Pre-K
through 6th Grade)
MD Media
NGO Non-governmental
Organizations/Employees
PK Parks and Protected Area Personnel
PRIV Private Sector
TEACH Teachers
UNIV University Professors and/or Students

**9: Methods of Delivering
Information/Programs**

WRK Workshop

(End Subproblem Two)

SUBPROBLEM THREE:
Resources available for environmental
education in Carazo



INS In-service Training of Teachers
PRE Pre-service Training of Teachers
DEM Demonstrations

12. Non-formal Avenues for Environmental Education

CH Church Groups
SCO Boy and Girl Scouts
WOM Women's Groups
NG Neighborhood Groups
4S Nicaraguan 4-H
BRIG Community Ecological Brigades

15: Environmental Education Programs in Planning for Future Implementation

(See Codes for 2: Environmental Education Programs Currently Underway in Carazo)

3: Environmental Education Resources Available to the Subject's Organization

4: Environmental Education Resources Available from the Subject's Organization

BIB Bibliography of Available Resources
COM Community Member with Expertise in Environmental Issues
CONF Conference Proceedings
CURR Curriculum Guide
EXP Environmental Expert
FILM Filmstrip
FOR School Forest
MOD Scientific Model
MUS Museum
NAT Natural Area
PAM Pamphlet
PARK Local Park
PICT Picture Book
POST Poster
TEXT Textbook
TNG Training Guide
UNIV University Specialist
VID Video

5: Funding/Sponsors of Environmental Education Projects

ADE ADECA
AID US AID
BID Bank of International Development (International Development Bank)
CAN Canadian Government or NGO
CEC CECOTROPIC
DAN Danish Government or NGO
EU European Union
FIN Finnish Government or NGO
FUN FUNCOD
GER German Government or NGO
IAB Inter-American Bank of Development
MAN MAN

MAR MARENA
MAY Mayor's Office
MED MED
MINSAs MINSAs
NAT Nature Conservancy
PC Peace Corps
POS POSAF
PROS PROSESUR
PV Private Organization
SWE Swedish Government or NGO
WB World Bank
WWF World Wildlife Fund

**14: Collaborating Institutions and Groups
(Currently Collaborating or Possible
Partners)**

CEC CECOTROPIC
FTF Farmer-to-Farmer
FUN FUNCOD
MAG Ministry of Agriculture
MAN MAN
MAR MARENA
MAY Mayor's Office
MD Media
MED MED
MINSAs MINSAs
NAAEE NAAEE
NAT Nature Conservancy
PC Peace Corps
POS POSAF
PRIV Private Sector
PROS PROSESUR
UNA UNA

(End Subproblem Three)

SUBPROBLEM FOUR:
Recommendations for improving
environmental education in Carazo



**12: Non-formal Avenues for Environmental
Education**

(See listing of codes under Subproblem Two.)

**13. Increasing Environmental Education
Non-formally**

FOR Public Forum
WK Community Workshop
ORG Method of Organizing Concerned
Citizens
TNG Training
EE Person Specifically Focused on EE in
Community

**(Note: Data gathered through the other three
subproblems were used to address
Subproblem Four.)**

2. Organizing Coded Data

After a comprehensive code chart was developed, the constant comparative method of Glaser and Strauss (1967) allowed the researcher to compare and contrast all the items of data assigned to the same coding category to identify new categories and sub-categories. This was undertaken through using the "Cut-Up-and-Put-in-Folders Approach" in which the transcripts were coded in the left hand margin by data unit (either sentences or paragraph). The traditional procedure requires making multiple copies of the transcripts, cutting the copies into strips, and placing them in folders marked with the coding categories. Once all of the transcripts are placed in coding folders, the content of each folder is carefully analyzed to find further subcategories and themes apparent in the data (Bogden and Biklen, 1982). In this study, the computer was used to do the cutting and pasting, eliminating the need to make multiple paper copies of the transcripts. The "cut" command of the computer was used as the scissors and the "paste" command allowed the data to be easily compiled into the coding categories.

B. Teacher Survey Data Analysis

The surveys used to gather information from Carazo teachers combined quantitative and qualitative data. (See Appendix G for copy of survey in English and Spanish.) In this research, these distinctions were made mainly because of the nature of the questions, whether they were closed or open-ended. Some questions provided teachers with a finite list of choices and asked them to choose one or two answers. Other questions were open-ended, allowing personalized responses that provided qualitative data.

1. Statistical Analysis of Quantitative Questions

Several closed questions were posed in a manner such that they could be easily coded into a number format for use in a computerized statistical program, Statistical Package for the Social Sciences (SPSS). These questions provided quantitative data in the form of descriptive statistics. For example, from a prefabricated list of seven issues, the teachers were asked to choose the one environmental problem that they considered to be the most important. (The list was determined based on information gathered through personal interviews and focus groups.) Each choice was given a letter code (A, B, C, D, and so on) so that it could be converted to a numerical value and quantitative data was easily derived from this information. For questions that produced quantitative data, descriptive statistics (including the mean, median, mode, and

range) for each question was computed. The computer program, SPSS, was used to calculate these statistics for the data gathered in the teacher survey.

2. Analysis of Open-Ended Questions

For open-ended answers, the responses were coded in the same manner as described in section II-A-2. The answers were given letter codes, divided up by categories that were developed after reviewing all of the data. Qualitative analysis of these responses provided the researcher with valuable information on teachers' use of and training in environmental education, as well as their access to environmental education resources. Additionally, statistical analysis of these answers was performed to determine the frequency, mean, median, and mode of open-ended answers.

C. Written Material Analysis

The primary and secondary documentary sources reviewed were used to provide contextual and historical perspective on the information gathered through the two main research methods, personal interviews and surveys. The data contained in the review of written materials provided a check on the information gathered through interviews and teacher surveys. Notes were taken on the documents reviewed and the data were cross-checked with other available information.

In reviewing the documentary sources, several items were considered. First, the researcher assessed the validity of the source being reviewed. Questions asked included: Who produced it? When? How? For whom? The researcher also considered how the information gathered from each source was relevant to the overall objective of the study. How does the information fit in with the research design? How does it support the methodological triangulation? In what other ways can this information be investigated? (For example, can this information gathered also be addressed through personal interviews or surveys?) After answering these questions, the information found in documentary sources was integrated into the study and used as a cross-check for data gathered through personal interviews and teacher surveys.

D. Focus Group Analysis

As the focus groups were conducted prior to the beginning of this study, the information gathered from them had already been organized into a chart listing critical environmental problems facing Carazo, perceived causes, and possible solutions. (See Appendix K.) The focus group information was used to assess the validity of answers received through the personal interviews and teacher surveys as these same issues were approached using those data collection methods. Results from the focus groups were considered in the analysis of interview and survey data as well as used in the development of suggested strategic plans under subproblem four of the study, to formulate ideas for a strategic environmental education plan based on research findings.

IV. Summary of Research Methods

This study used several data collection and analysis methods to provide triangulation and ensure greater validity. It is crucial to cross-check data, especially when the majority of them are gathered through subjective methods such as personal interviews and surveys. The perceptions of one interview subject may be completely different from the perceptions of a survey subject, which may also differ from what can be read in a departmental document or the outcomes of a focus group discussion.

Although four different research methods were used, the data gathered through personal interviews and teacher surveys provided the majority of the information specifically focusing on the state of environmental education in Carazo. Because of this, the data from those methods were analyzed carefully and thoroughly using statistical as well as qualitative techniques that follow along the lines of case-study research.

CHAPTER FOUR: RESULTS

The purpose of this study was to identify environmental education needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in the Carazo department of Nicaragua. These four areas were addressed using both quantitative and qualitative data gathering techniques.

Personal interviews and teacher surveys were conducted beginning in August 1997 and ending in January 1998. A review of materials and compilation of focus group results were accomplished also working from August 1997 to January 1998. The multiple methods used served to validate the data, creating triangulation between information gathered with each method providing a check for the other.

Personal Interview Data Used to Compile the Study Results

Personal interviews were conducted with representatives of organizations or agencies who are currently involved in or have the potential to be involved in environmental education activities in Carazo. Twenty-three subjects were interviewed using a framework that centered around the four subproblems of the study. Questions were modified for each subject to reflect the researcher's prior knowledge of the subject's organization or programs. While all parts of the 23 interviews were transcribed, coded, and summarized, only the findings that are directly related to this study's four subproblems are included in this analysis.

Throughout this chapter, when information from interviews is included, it is followed by a code. The codes provide the following information: The first Roman numeral represents the organizational type of the interview subject. (See Table 3-3 for full listing of Roman numeral codes and organization types.) In the following example, the subject's organization belongs to group I, the national-level government agencies. The next Arabic numeral is the unique interview number. To ensure anonymity, the interview subjects are identified only by their organization type and interview number. In the following example, the quote is from interview subject number five. The third number in the first set of parentheses identifies the page number from the transcription on which this quote can be found. The second set of parentheses indicates in which coding section this piece of information was placed. For example, this quote can be found in section number 1 ("Carazo's most critical environmental problems that can be

addressed through environmental education”) under the topic of deforestation, coded as “DEF.” The third set of parentheses contains information on the other sections in which this particular piece of information may be found. In addition to section 1 under deforestation, the following quote was also coded and placed in section number 1 (Most Critical Environmental Problems) under “H2O” or water contamination, and “EE” or a lack of environmental education. If the passage is included in only one section, the third set of parentheses will read (XX).

- We have a document which expresses which problems are the priority—including deforestation, water contamination and the lack of environmental education. The two main problems stated in that document are deforestation and environmental and water contamination. (I, 5, 2) (1.DEF) (1.H2O; 1.EE)

To provide a second example, in the following passage the interview subject is from an international government organization (VI), is subject number 12, and the statement can be found on page 3 of the transcription. This quote is taken from section 2, “Environmental education programs currently underway,” in the “TTNG” or teacher training category. It is also included in section 9, “Methods of Presenting Information,” in the workshop category and under section 8, Audience of Environmental Education Programs, in the teacher category.

- Then we’re going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade—so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas. (VI, 12, 3) (2.TTNG) (9.WRK; 8.TEACH)

Teacher Survey Data Used to Compile the Study Results

The teacher survey was targeted specifically for an audience of teachers in Carazo. Eighty-three teachers were surveyed, representing about eight percent of the total population of formal educators in the department. (The total number of teachers [including public and private schools] in the department is approximately 1,000.) Open-ended questions that required qualitative analysis were included in the teacher survey instrument. As with the information from the interviews, while all data segments were coded and analyzed, only the findings that were directly related to this study’s four subproblems were included in this analysis.

Qualitative information gathered through the teacher surveys was coded in a manner similar to that described in the “Personal Interview” section above. The following example illustrates the coding method used: The first set of parentheses contains information on the

subject number and type of school. To ensure anonymity, no school names have been used in coding the data from the teacher surveys; rather a unique number was assigned to each survey and is followed by a letter indicating the type of school in which the teacher who filled out that particular survey works. (For information on school type codes, see description in Chapter 3 under I-D-3, "Teachers.") In the following example, this passage comes from interview number 15 and is representative of school type D (urban, private, secondary). This quote was written in response to question 1, "In your own words, define environmental education." In this case, the passage was coded under the category of "P/C" or "preservation/conservation component." It can also be found under "TOT" or "Totalitarian view/encompasses everything."

- To teach to love everything that surrounds us—water, air, fields, rivers, flora and fauna—and conserve them. (15D) (1.P/C) (1.TOT)

Documentary Review Data Used to Compile the Study Results

A third method used to gather and verify information on the state of environmental education in Carazo was to review local and national environmental education publications and documents. Five key documents were reviewed and the data gathered from these documents were compared and contrasted with the information gathered through the personal interviews, teacher surveys, and the focus group outcomes. The information from each of these documents was arranged into a format that could be easily compared with data being gathered to address each of the four subproblems.

Focus Group Data Used to Compile the Study Results

The final data-gathering method used in this study was to analyze information from a focus group workshop that took place in Carazo in spring 1997. Originally the researcher had planned to conduct a focus group to determine which environmental problems Carazo's citizens most wanted to have addressed through environmental education programs in their department. However, this task had already been accomplished during one of the first meetings of Carazo's Environmental Education Commission. In September 1996, the Environmental Education Commission developed a list of problems, causes, effects, and alternatives to environmental problems being experienced in Carazo. The results from this focus group work were used to support and investigate the first and the fourth subproblems of this study. (Identifying key environmental problems and making recommendations for subsequent actions.)

This chapter will report on the findings of this study in the following manner:

- I. **Subproblem One: To identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations.**
 - A. **Personal Interview Results**
 1. Most Critical Environmental Problems Facing Carazo
 2. Greatest Barriers to Teaching Environmental Education in Carazo
 3. Factors That Would Improve Level of Environmental Education in Carazo
 4. Summary of Personal Interview Questions Relating to Subproblem One
 - B. **Teacher Survey Results**
 1. Definition of Environmental Education
 2. Most Critical Environmental Problems Facing Carazo
 3. Greatest Barriers to Environmental Education in the Formal Sector
 4. Factors That Would Help Improve Level of Environmental Education
 5. Summary of Teacher Survey Questions Relating to Subproblem One
 - C. **Results from Review of Written Material**
 1. Peace Corps' "Draft Environmental Action Plan"
 2. MAN's "Approval of the General Environmental and Natural Resource Law"
 3. Santa Teresa's "Document on Environmental Education in the Municipality of Santa Teresa: Subcommission on Environmental Education"
 4. MARENA's "Guide for Determining Methodologies for Environmental Action for the Ecological Service for Secondary Students"
 5. Summary of Review of Written Materials Relating to Subproblem One
 - D. **Results from Focus Group**
 - E. **Summary of Results Relating to Subproblem One**
- II. **Subproblem Two: To identify and describe the design and perceived success of environmental education programs currently underway in Carazo.**
 - A. **Data Gathering Sources**
 1. Personal Interview Results
 2. Teacher Survey Results
 3. Documentary Source Review Results
 4. Focus Group Results
 - B. **Environmental Education Programs Currently Underway—Topics, Participants, Funders, Strengths, and Weaknesses**
 1. **Formal Education Programs (K-12 and University)**
 - a) Ecological Brigades
 - b) Required 60 Hours of Ecological Service Work
 - c) Programs Working Directly with Students and Teachers in Schools
 - d) Teaching Currently Underway as Provided by Teachers in Formal Settings
 - e) Curriculum Guides
 - f) University-Level Programs
 2. **Teacher Training Programs**
 - a) Teacher Survey Responses Regarding Teacher Training in Environmental Education
 - b) Interview Responses Regarding Teacher Training in Environmental Education
 - c) Summary of Teacher Training Programs

3. Environmental Campaigns and Parades
 - a) Description of Environmental Campaigns and Parades
 - b) Successes of Environmental Campaigns and Parades
 - c) Problems with Environmental Campaigns and Parades
 - d) Summary of Environmental Campaigns and Parades
4. Government Sponsored Programs and Initiatives
 - a) Description of National Environmental Education Meetings
 - b) Description of National Strategic Plan for Environmental Education
 - c) Description of Departmental Environmental Education Commission
 - d) Summary of Government Sponsored Programs and Initiatives
5. Technical Assistance Programs
 - a) Description and Successes of Technical Assistance Programs
 - b) Problems with Technical Assistance Programs
 - c) Summary of Technical Assistance Programs
6. Issue Focused Technical Assistance Programs
 - a) Deforestation Issues Addressed through Technical Assistance Programs
 - b) Solid Waste Management Addressed through Technical Assistance Programs
7. Environmental Education and Interpretation Programs in Natural Areas of Carazo
 - a) Interpretive Programs Offered at Natural Areas
 - b) Interpretive Training in Natural Areas
- C. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 1. Successes of Environmental Education Programs Currently Underway in Carazo
 - a) Involvement of Students and Teachers in Programs
 - b) Involvement of Local Community Members in Programs
 - c) Involvement of Government Personnel in Programs
 - d) Summary of Successes of Programs Currently Underway in Carazo
 2. Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Lack of Knowledge, Time, and Interest of Program Leaders
 - b) Lack of Sustainability of Foreign or NGO-supported Programs
 - c) Lack of Funding and Resources for Environmental Education Programs
 - d) Lack of Planning and Coordination Among Organizations and Agencies Involved in Environmental Education
 - e) Lack of Government Commitment to Environmental Education
 - f) Lack of "Real Life" Relevancy in Environmental Education Programs
 - g) Lack of Follow-through and Evaluation of Environmental Education Programs
 - h) Summary of Problems with Environmental Education Programs Currently Underway in Carazo
- D. Summary of Results Relating to Subproblem Two: Environmental Education Programs Currently Underway in Carazo
 1. Description of Environmental Education Programs Currently Underway
 - a) Formal Education Programs (K-12 and University)
 - b) Teacher Training Programs
 - c) Campaigns and Parades
 - d) Government Sponsored Programs and Initiatives

- e) Technical Assistance Programs
 - f) Issue-focused Technical Assistance Programs
 - g) Environmental Education and Interpretation Programs in Natural Areas of Carazo
2. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Successes of Programs Currently Underway
 - b) Problems with Programs Currently Underway

III. Subproblem Three: To identify and describe existing resources (e.g. people, printed materials, protected areas, and so on) for environmental education in Carazo.

- A. Personal Interview Data
- B. Teacher Survey Data
- C. Personal Interview and Survey Results Regarding Environmental Education Resources Available in Carazo
 1. Printed and Audio-Visual Resources
 - a) Textbooks and Guides
 - b) Posters, Pamphlets, and Picture Books
 - c) Training Guides
 - d) Conference Proceedings
 - e) Bibliographies
 - f) Audio-Visual Materials
 2. Community Resources
 - a) Environmental Experts, University Specialists, and Natural Resource Professionals
 - b) Local Parks and Natural Areas
 - c) Centers of Learning
 3. Financial Resources and Collaborating Institutions
 - a) Nicaraguan National and Departmental Government Agencies
 - b) Municipal Level Government Offices
 - c) Nicaraguan Non-Governmental Organizations
 - d) Foreign Government Agencies and Organizations
 - e) Foreign Non-Governmental organizations
 - f) International Government Organizations
- D. Summary of Results Relating to Subproblem Three: Resources Available for Environmental Education in Carazo
 1. Printed and Audio-Visual Resources
 2. Community Resources
 3. Financial Resources and Collaborating Institutions

IV. Summary of Results from the First Three Subproblems of this Study

I. Subproblem One: To identify and describe environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations.

Effective environmental education programs must be based on local needs. Because of this, it was crucial to first determine what the environmental education needs of Carazo's

citizens were. The tactic used to investigate this subproblem was to determine which environmental problems the people living in and around Carazo perceive to be the most important ones to address. These problems will provide an indication as to the direction in which programs should be focusing their energies to address problems that are critical to the communities. The environmental education needs can be derived from the issues on which the local citizens believe environmental education programs should be focusing.

Also used as indicators of the environmental education needs of Carazo's citizens were questions about what suggestions interview subjects might have regarding how best to increase the level of environmental education in Carazo and what they perceived to be the biggest barriers to environmental education in Carazo. These questions provided information on what kinds of programs may currently be lacking in the department, and what kinds of programs would be the most useful to increase environmental education in the area.

The results from subproblem one will be presented in the following manner:

- A. Personal Interview Results
 - 1. Most Critical Environmental Problems Facing Carazo
 - 2. Greatest Barriers to Teaching Environmental Education in Carazo
 - 3. Factors That Would Improve Level of Environmental Education in Carazo
 - 4. Summary of Personal Interview Questions Relating to Subproblem One
- B. Teacher Survey Results
 - 1. Definition of Environmental Education
 - 2. Most Critical Environmental Problems Facing Carazo
 - 3. Greatest Barriers to Environmental Education in the Formal Sector
 - 4. Factors That Would Help Improve Level of Environmental Education
 - 5. Summary of Teacher Survey Questions Relating to Subproblem One
- C. Results from Review of Written Material
 - 1. Peace Corps' "Draft Environmental Action Plan"
 - 2. MAN's "Approval of the General Environmental and Natural Resource Law"
 - 3. Santa Teresa's "Document on Environmental Education in the Municipality of Santa Teresa: Subcommittee on Environmental Education"
 - 4. MARENA's "Guide for Determining Methodologies for Environmental Action for the Ecological Service for Secondary Students"
 - 5. Summary of Review of Written Materials Relating to Subproblem One
- D. Results from Focus Group
- E. Summary of Results Relating to Subproblem One

A. Personal Interview Results

The personal interviews looked at the three areas mentioned above: the most critical environmental problems facing Carazo that can be addressed through environmental education; the greatest barriers to formal environmental education in Carazo; and the factors that would best help to improve environmental education in Carazo.

1. Most Critical Environmental Problems Facing Carazo

The first subproblem was addressed directly in the personal interviews by asking the subjects about Carazo's critical environmental problems. All 23 interview subjects were asked, "What do you perceive to be the most critical environmental problem facing Carazo that can be addressed through environmental education?" The answers were coded into 18 categories. (See figure 3-2 for diagram of categories. See Appendix L for full listing of categories.) Although subjects were asked to identify what they perceived to be the one most critical environmental problem facing Carazo, most subjects elaborated upon several problems they felt were crucial and almost all subjects stated that it was difficult to choose just one problem. For this reason, the researcher coded all mentions of environmental problems that the subjects perceived to be critical, not only the first problem mentioned.

Out of the 142 mentions made of critical environmental problems, the majority of the mentions fell into the solid waste (24%) category. Following next were water contamination, mentioned 23 times (16%); deforestation mentioned 21 times (15%); and sewage or gray waters, mentioned 11 times (8%); and lack of environmental culture or sensitivity, mentioned 10 times (7%). The following table indicates the ranking of all 17 environmental problems mentioned by interview subjects.

**Table 4-1: Critical Environmental Problems as Mentioned in Personal Interviews
(Percentages calculated based on a total of 142 mentions by 23 interview subjects.)**

Environmental Problem	Number of Mentions	Percentage of Total	Ranking
Solid Waste	34	24%	1
Water Contamination	23	16%	2
Deforestation	21	15%	3
Sewage Waters or Gray Waters	11	8%	4
Lack of Environmental Culture or Sensitivity	10	7%	5
Pesticide Poisoning	8	6%	6
Economic Situation in Nicaragua	8	6%	6
Air Pollution	4	3%	7
Lack of Environmental Education Programs	4	3%	7
Lack of Understanding of the Connection Between Personal Actions and Environmental Problems	4	3%	7
Loss of Native Species	4	3%	7
Soil Erosion	3	2%	8
Chemical Contamination	2	1%	9
Loss of Biodiversity	1	.7%	10
Overpopulation	1	.7%	10
Toxic Waste Management	1	.7%	10
Unsanitary Slaughterhouse Conditions	1	.7%	10

As is evident in Table 4-1, the majority of concern falls into the first three categories, solid waste management, water contamination, and deforestation. The first major problem, solid waste, is a visible one and has an immediate impact on human health and well-being.

- I think that waste management is a very big problem; people throw garbage and all their waste and water and sewage or the rain water drainage system, which eventually will contaminate surface water sources (rivers, lakes). (II, 1, 7) (1.SW) (XX)
- We have a recently-formed environmental commission and the problems we've targeted begin with basura—trash. It is the biggest concern right now . . . not just because it doesn't look good but also we've had outbreaks of diarrhea and dengue and other mosquito/fly related illnesses. It's got a lot to do with the improper disposal of trash. Also the dirty water that people throw out of their patios. (VI, 4, 2) (1.SW) (1.GRAY)
- . . . That is the most critical issue—solid waste management or toxic waste management—all the leftovers—what you can see in Nicaragua. It's so obvious. (I, 11, 3) (1.SW) (1.TOX)

The second major problem, water contamination, has strong links not only with human health but also direct links with human actions. Deforestation is a major cause of water contamination as deforested areas have extensive soil run-off into water sources. Additionally, improper disposal of sewage waters (“aguas negras” or gray water) contaminates drinking water sources for many towns in Carazo. Ineffective or non-existent sewage systems cannot adequately handle the cooking, bathing, and other waste waters that are deposited in Carazo’s streets. A final, major cause of water contamination is the intentional poisoning of rivers to kill or stun fish for easier collection. This is usually accomplished by dumping large amounts of pesticides into the water, which causes the fish to float to the top. This fishing method is a huge concern to Carazo’s citizens and natural resource managers, and contributes substantially to the area’s water contamination problems.

- The same problems as in the rest of Nicaragua. (1) Deforestation which leads to the disappearance of rivers, flooding, problems with water quality. (2) Water pollution from discarded city waters due to badly designed aqueduct systems. (I, 8, 1) (1.H2O) (1.DEF)
- Another problem [I see] is the “aguas negras” [sewage waters]. [The municipality of San Marcos is] going to try to put in a septic system within the town here but [our] septic tanks are about 2 km. out of San Marcos and they do have a treatment plan made for the water but it comes out about 90 percent pure and that goes straight into the Laguna of Masaya and this will continue to contaminate the Laguna which already has a lot of contamination problems. [I believe] that this Laguna could be a solution to the water problem here if it was kept clean and pure because a lot of these other sources are drying up right now—and if they don’t change it will get worse. (III, 17, 1) (1.H2O) (XX)
- Pollution in the community of water and soils and in the garbage has been the cause for the top six important health issues. Different kinds of sicknesses including infectious diseases, diarrhea and things like that. (II, 22,1) (1.H2O) (1.SW, 1.SOIL)
- Pollution of rivers is a big problem here with the chemical used to get shrimp out of the rivers. The people need this kind of activity to survive but, at the same time, they don’t know about the problems that they’re causing by poisoning the rivers and, in this, you can use the EE to help them realize that using chemicals in the river in the end will hurt them. (II, 22, 1) (1.H2O) (1.PEST)

The third major problem mentioned, deforestation, is evident in more of a chain-of-events manner—deforestation leads to habitat loss and soil erosion, which leads to water contamination, which leads to health problems, microclimate changes, and so on. The cascading effect of deforestation has made it a critical problem in the eyes of the interview subjects.

- . . . actually there's no one problem, there are several problems but one of the problems [I] consider the most serious problem is the watershed of the Rio Grande—which actually is one-third of the area of the whole state of Carazo. There has been a whole lot of deforestation that has occurred there and of course the habitat of many species has been lost and of course the rivers have diminished their flow but of course right now some programs have been implemented in order to try to restore the ecosystem of the watershed. (VII, 10, 2) (1.DEF) (2.H20)
- The rate of growth, as always, depends on the amount of rain and quality of soils. Depleted soils of the watershed of the Rio Grande and the 60 to 70 percent rate of deforestation is the number one cause that POSAF is working on in Carazo. (II, 7, 1) (1.DEF) (XX)
- The [environmental] commission [of Carazo] is also interested in protecting/planting trees. The areas that have been losing trees are getting drier and hotter. I think they're really interested in preserving the beauty here and, more than that, preserving the climate. (VI, 4, 2) (1.DEF) (XX)

(The full document of compiled interview results from this first subproblem can be found in Appendix L.)

The personal interview results pointed toward two very visible problems as being the most critical to address through environmental education. This can be explained in a two ways. First, people tend to associate themselves with and have a stronger connection to visible environmental issues (Belden and Russonello, 1996). Solid waste and deforestation are environmental issues in which changes can be noticed and observed within a human lifetime.

Second, it is easier to encourage people to rally around efforts that are directly related to their daily lives. The question asked in the interviews was not only, "What do you perceive to be the most critical environmental problem facing Carazo (or Nicaragua in general)?" Rather, the question was tied to environmental education efforts by asking, "What do you consider to be the most critical environmental problem facing Carazo (or Nicaragua in general) *that can be addressed through environmental education?*" To address an issue through environmental education, it must be tangible, compelling, and have a strong tie to the citizens' daily lives. It would be extremely difficult, for example, to rally people around the idea of increasing environmental awareness and sensitivity as both are rather intangible issues. People tend to be motivated by environmental issues that hit close to home, and have immediate personal and visible effects.

2. Greatest Barriers to Teaching Environmental Education in Carazo

The next question that was analyzed in reference to subproblem one was, "What do you perceive to be the greatest barriers to teaching environmental education in Carazo?" Although this question was asked separately from the question describing current programs in environmental education, many of the answers overlapped as people naturally began referring to current programs' successes and failures as models for what was creating barriers to environmental education in the department. Because of that, a few of the answers included in this section are also coded under topic 6, "Problems with Environmental Education Programs Currently Underway." Some of the answers discussed in this section were coded under the "greatest barriers" question.

Fifteen different coding categories were used to analyze the responses to the "greatest barriers" question. (For a full listing of the categories from each of the questions, see Figure 3-2.) Out of the fifteen categories, the two "greatest barriers" that were most frequently mentioned were lack of funding and lack of time dedicated specifically to environmental education activities.

Within the topic of lack of funding, there were two veins. One was the minimal salary paid to Nicaraguan teachers. The second was the lack of available funding for environmental education programs themselves. Along the issue of the teachers' salaries, several interview subjects remarked that there was no financial incentive for teachers to go "above and beyond" to bring environmental education into the classroom.

- The barriers I first noticed when I got here were the teachers—I mean the teachers don't make much here. They really don't make enough money to support a family and a lot of them have second jobs, which means they're leaving the school right after school and going to a second job. (VI, 4, 5) (10.\$) (10.TIME)
- The resources are very scarce and [we] should try to do more things . . . but the salary [we] get is very little so the things we do—[we] don't do them because [we] want to get an economical reward but [we] do it because [we] want to have a more beautiful environment . . . (VII, 10, 4) (10.\$) (6.\$)
- It is lack of resources and, also, one that is indirect but important is the salary that [the teachers] make. Usually teachers are paid, on average, the equivalent of \$50/month and they work very hard. So, they don't have the incentive to get better. (VI, 13, 11) (10.\$) (XX)
- . . . unfortunately those teachers who are in charge of those 60 hours don't get paid any extra and, unless they get paid, they're not going to do any kind of programs of that sort, that would invest more time. It's easier for them to just have kids pick up garbage for those 60

hours. And the others that might be interested in it are involved in so many other things and don't have the time for it. (V, 23, 4) (6.\$) (6.TIME)

An additional barrier related to monetary issues is the lack of funding specifically for environmental education programs. This seemed to be a problem for start-up programs as well as programs already in existence, and was seen as a general barrier to any sort of environmental education.

- The departmental commission on environmental education is trying to work on some of these problems [soil erosion, deforestation, disappearance of native species, water pollution, pesticide poisoning, lack of environmental education programs] but they need help finding funding to promote projects. (II, 7, 1) (10.\$) (6.\$)
- . . . [I believe] it's a really good resource to do the teaching [at the normal school] with the teachers and the students but a lot of people don't feel that that's that important and, right at the moment, [CECOTROPIC and MED] don't have a lot of money to do these programs at the normal. (V, 23, 7) (6.\$) (2.TTNG)
- [An environmental study done by high school students in San Marcos] was applauded by a lot of organizations and groups but [we] wrote up a mini-project but [we] haven't gotten an answer as far as where their funds are coming from to do [the proposed project based on the study]. [We] are looking for materials to start the project around here Meanwhile, [we're] still waiting on getting some funding to start [our] projects. So, [I find] economic problems [to be one of the biggest barriers to environmental education in Carazo]. . . . (III, 17, 2) (6.\$) (XX)

The other most frequently mentioned barrier was time. This includes lack of time on the part of the project participants as well as the project leaders. Interview subjects expressed frustration with the way in which school time is used, implying that more time in school isn't what is needed; rather, what is needed is a reorganization of the time that is already allotted for programs and classes. It is also interesting to note that all of the interview subjects who mentioned time as a barrier to environmental education were non-Nicaraguans.

- Other restrictions are temporal. It's kind of crazy to say but, they just have a different idea totally of time down here. . . . Activities never start on time, and people don't utilize the time they have. The schools only run half a day and I can't get my ecological brigade to do anything other than during school time. It blows my mind that they have a half day of vacation every day, but the director told me that we can't schedule ecological brigade activities, because basically he doesn't think anybody would show up for them. (VI, 4, 6) (10.TIME) (XX)

- [Interviewer] So that might be another thing that could increase environmental education—more time in school? [Subject] Possibly, but the teachers can't teach what they don't know anything about or have the initiative to learn or plan for. More school time doesn't seem realistic at this point. (VI, 12, 10.TIME) (10.KNOW; 10.INT)
- So, the kids liked the idea of working on the weekends—they always participated then. But as Peace Corps, we need to work with other Nicaraguans—and I couldn't get the teachers to do it. Well, I got one teacher to do it maybe two or three Saturdays and that was all and he no longer wanted to do it. He resigned from being the Brigada leader. (VI, 3, 2) (6.LTIME) (XX)

Another environmental education barrier mentioned exclusively by non-Nicaraguans was the teaching methods encouraged at the normal (teacher training) schools. The methods taught at normal schools are very traditional and don't use active methodologies, which are popular and effective in environmental education. Along the lines of training barriers, several mentions were made of the lack of adequate environmental education training in the normal schools.

- I think a big problem in education is ineffective teaching methods (including “by example”—it's frustrating when the teacher throw trash in the street after school clean-ups). A teacher I worked with in La Paz was just copying lengthy paragraphs out of the book and said, “Okay kids, let's copy this.” It just didn't have any effect on the kids. Instead, he could give [talks] taking the trash, burying it, and digging it up two months later. They don't think about it. (VI, 4, 5) (10.TNG) (6.TNG)
- From the year 1983, we started incorporating environmental education into the curriculum from the Ministry of Education and even people from FUNCOD . . . were working with them but one of the weaknesses that was striking in those days was, like right now, that there was not a proper training for the teachers so that they could implement . . . whatever they have incorporated into the environmental education program and [I] still feel that there is a need to do that But again [I feel], and [I emphasize] the fact that more training should be done in order to capacitate the teachers so that they can pass on the knowledge that they acquire to the students. (I, 11, 3) (10.TNG) (XX)
- I think the way that people teach here—I know that there is a school called the “Normale” where all the teachers go and then they do a one or two year internship in different parts of Nicaragua. However, the training doesn't seem to help because many teachers just talk at the kids and the students don't pay attention. There's not enough hands-on activities or labs I don't think money is the big problem—I think it's just ideas and the way their teaching is here. Some teachers are great, however it seems that the majority of teachers use traditional teaching methods, and the kids don't learn to think for themselves or learn to solve problems or even analyze what the problem is. (VI, 12, 4) (10.TNG) (XX)

Other barriers that were mentioned, by Nicaraguans and non-Nicaraguans alike include the lack of coordination between organizations and agencies interested in environmental education and offering environmental education programs (including the formal sector, non-formal sector, and government agencies); and the fact that environmental education is not a priority at the national level.

3. Factors That Would Improve Level of Environmental Education in Carazo

As a complement to the question about what the interview subjects perceived to be the greatest barriers to environmental education was a question about what factors would best help to improve the level of environmental education in the formal setting. Although eight coding categories were used, the majority of responses fell into the categories dealing with teacher training—both in-service and pre-service. Also mentioned was training not only for formal but also for non-formal environmental educators working in the communities of Carazo.

- And those two weeks [dedicated to teacher training before the beginning of every school year] could really be taken advantage of by using them to give maybe a two day workshop on how to incorporate environmental topics in the different classroom issues and how to use their guidebook that they do have by MED and the environmental issues they're supposed to cover. (VI, 3, 4) (11.TNG) (XX)
- I think, in the [normal school] they should incorporate teaching about the environment. I think they're doing that right now—they're teaching teachers how to raise [tree nurseries], how to do composting—but I don't know if they're teaching about how to think, about how animals adapt or how to make up experiments or do investigations of any kind. But it would be a good idea to teach how to encourage students to think for themselves. I think labs should be required in primary and secondary schools and a science fair could be implemented into the program. (VI, 12, 5) (11.PRE) (2.TTNG, 8.TEACH)
- It would be nice to have someone here to orient [non-formal environmental educators] to EE so that [we're] not just wandering around blindly, experimenting with ways to educate about the environment. There's a lot of people that would probably like to work within this area but there hasn't been given a lot of priority to it or a place where [we] can exchange ideas or questions—a place where they could get together and work on what is EE. [I hope] that maybe [the interviewer] could support [us] in that—with the orientation and with this project—to get an objective so that [we're] not just wandering around. (V, 18, 2 & 3) (11.TNG) (11.NWK)

4. Summary of Personal Interview Questions Relating to Subproblem One: Identifying Environmental Education Needs in Carazo

Subproblem one of this study looked at environmental education needs in Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations. Representatives from each of these aforementioned groups (teachers and local and national government and non-governmental employees) were interviewed as part of the study. This subproblem was addressed through answers to questions on what the interview subjects perceived to be the most critical environmental problems facing Carazo, what they believed were the greatest barriers to environmental education in Carazo, and, finally, what factors they believed would best help to increase the level of environmental education in Carazo.

Overall, the environmental education problems deemed to be the most critical ones to be addressed through environmental education were deforestation and solid waste management—both problems with immediate and visible consequences. Deforestation is closely linked to numerous other environmental problems such as soil erosion, water contamination, habitat loss, climate change, and the loss of native species. Solid waste management is another keystone issue with links to human health and hygiene issues, as well as water and soil contamination among others.

The greatest barriers to formal environmental education, as expressed by interview subjects, were lack of time (in the sense of poor time management, not that more time should be allocated in school) and lack of funding (both for specific projects and in relation to the salaries paid to teachers). The factor that is believed to have the most potential to improve the level of formal environmental education is an increase in and different approaches to pre-service and in-service teacher training in environmental education and active methodologies.

To summarize, according to the 23 personal interview subjects, environmental education programs in Carazo should focus on the issues of solid waste management and deforestation. In-service and pre-service training programs are needed for formal educators. These training programs should focus on the use of active methodologies and making the best use of classroom time to address these and other critical environmental issues.

B. Teacher Survey Results

The teacher surveys looked at the same three areas discussed in the personal interview section: the most critical environmental problems facing Carazo that can be addressed through

environmental education, the greatest barriers to formal environmental education in Carazo, and the factors that would best help to improve environmental education in Carazo.

The teacher survey also addressed two additional questions about teachers' definition of environmental education and whether they thought it was important to teach about the environment in their classes. The answers to these questions worked toward developing a complete answer for subproblem one, dealing with Carazo's environmental education needs. This analysis will begin with looking at these two additional questions. It will then continue with looking at the three questions addressed under the personal interview analysis and mentioned in the previous paragraph.

1. Definition of Environmental Education

The first question on the teacher survey asked, "In your own words, define environmental education." The second question had two parts. Part one was a question to which the teachers answered "yes" or "no." The question read, "Do you think it is important to include teaching about the environment in your class?" Part two asked for a description of why s/he thought it was or was not important to include teaching about the environment in his/her class. This question read, "Please describe why or why not."

These questions were asked to determine the level of knowledge and understanding that teachers possessed regarding environmental education. The answers related to subproblem one, about the environmental education needs in Carazo, as they indicated the teachers' level of comprehension of environmental education and provided baseline data on which to build future environmental education training programs.

The answers to the first question, about the teachers' definition of environmental education, were organized and analyzed using 18 different codes. (See Appendix M for the listing of codes used to analyze this question.) Table 4-2 shows the results from the coding and analysis of the answers to teacher survey question number one.

Table 4-2: Teachers' Definitions of Environmental Education
(Percentages calculated based on a total of 172 mentions by 83 teachers.)

Defining Characteristic	Mentions	Percentage	Ranking
Preservation/Conservation Component	44	53%	1
Focus on Environmental Knowledge	16	19%	2
Utilitarian Attitude Toward the Environment	16	19%	2
Dealing with Natural Resources	15	18%	3
Totalitarian View/Encompasses Everything	13	16%	4
Awareness of and Sensitivity to Nature and the Environment	10	12%	5
Affects/Forms People's Attitudes/Values Toward the Environment	9	11%	6
Focused on Human Health Issues	8	10%	7
Focused on Certain Environmental Issues	8	10%	7
Focused on Cleanliness	7	8%	8
Focused on Interrelationships Between Humans and the Environment/Nature	6	7%	9
Focused on the Local Environment, Local Issues	5	6%	10
Preserves/Protects the Environment for Future Generations	3	4%	11
Action Component	3	4%	11
Focus on Human Hygiene	3	3%	12
Responsibility Component	2	2%	13
Legal Component	2	2%	13
Aesthetic Component	2	2%	13

As is clear in Table 4-2, the majority of teachers defined environmental education as having a preservation or conservation component. The percentages mentioning environmental knowledge, displaying a utilitarian focus, dealing with natural resources, and demonstrating a totalitarian viewpoint dropped sharply from the first ranked preservation/conservation category but still ranked considerably above the remaining 13 categories.

Fifty-three percent of the teachers indicated that environmental education includes a strong component of preservation or conservation of nature and the environment.

- It is to instruct about the necessity of protecting the animals, and ways to protect and conserve the environment. (2E) (1.P/C) (XX)
- Environmental education: it is the care, protection, and conservation of all the natural riches (treasures) that the environment possesses. (3C) (1.P/C) (1.NR)
- It is education that should be taught from infancy to prepare the individual because, through this knowledge, they learn the importance of caring about and protecting the environment and thus avoid [its] progressive deterioration and its grave consequences and learn to conserve resources. (42E) (1.P/C) (1.A/S, 1.KNOW, 1.NR)

The next most cited components of environmental education were environmental knowledge, and a utilitarian view of nature and the environment. The utilitarian view sometimes included a sustainable development tone, while other times it was centered on making the best of the natural resources while they last.

- It is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations: (18D) (1.UTIL) (1.RESP, 1.NR, 1.HYG, 1.HEA, 1.FUT)
- Environmental education is understood as the protection and wise use of nature, the environment in which we live. (76I) (1.UTIL) (1.P/C)
- Educate about the conservation of the natural or artificial resources in a way that they can last longer, and benefit humans while [the natural resources] last. (31E) (1.UTIL) (1.P/C, 1.NR)

Knowledge about the environment was believed to be an integral part of environmental education by one-fifth of the teachers. This knowledge was not necessarily issue-centered, but included a knowledge component focused on understanding the importance of nature and the environment to humans—once again, a utilitarian point of view.

- Our knowledge that we teach to maintain the environment, or what remains of the environment, and improve it for the well being of human beings. (22G) (1.KNOW) (1.UTIL)
- Teachings about the knowledge of our environment and the conservation and preservation of our natural resources, and its limited use and protection. (36B) (1.KNOW) (1.UTIL, 1.P/C, 1.NR)
- Environmental education is no more than the physical and biological preparation of every person and their surroundings. Also, I want to say that we should keep our homes, schools,

and all places where we are involved healthy. To transmit our knowledge about how to protect the environment. (73A) (1.KNOW) (1.LOC, 1.CLE, 1.HEA)

When comparing the answers given by these teachers with the internationally-accepted definition of environmental education, it can be seen that several of the most important aspects are not included in the majority of the teachers' perceptions of environmental education. The Tblisi Declaration (discussed in more detail in section I-B of Chapter Two and presented in Appendix B) defines environmental education as:

a process aimed at developing a world population that is aware of, and concerned about, the total environment and its associated problems, and which has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

(UNESCO, 1978)

The key characteristics of this definition are that it includes the five components of environmental education: awareness; knowledge; attitudes and values; citizen action skills; and citizen action participation. By this definition, only one of the 83 teachers surveyed provided a relatively comprehensive definition of environmental education.

- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.P/C) (1.A/V, 1.A/S, 1.ACT, 1.KNOW, 1.INTER)

2. Most Critical Environmental Problems Facing Carazo

The first subproblem was also addressed in the teacher surveys through a multiple choice question that included an option for writing in additional environmental problems not included in the original list of choices. The question read, "The following list of environmental problems was compiled by groups of educators, students, NGOs, governmental agencies, and environmental specialists. Please mark the **one problem** that you consider to be the most important." The answer choices included: trash, deforestation, lack of an environmental culture or sensitivity, soil erosion, sewage waters, water contamination, and pesticide poisoning. (See Appendix G to view the entire survey in English and Spanish.) The final choice was "Other:

please describe” to allow respondents to add their own choice for the “most important environmental problem,” if their choice was not originally included on the list.

The most common answer given by teachers when asked about the most important environmental problem was “lack of an environmental culture or sensitivity.” A total of 49 teachers chose this answer, 60% of the total. The next most frequent choice was “deforestation,” with 24 teachers choosing this answer, 29% of the total. The next four choices (trash, water contamination, other problems, and soil erosion) dropped steeply in frequency. The following table (4-3) lists the total number of mentions of each problem and ranks them by percentage out of the total number of responses.

Table 4-3: Critical Environmental Problems as Indicated on the Teacher Survey (Percentages based on 101 mentions by 83 teachers.)

Environmental Problem	Number of Mentions	Percentage	Ranking
Lack of Environmental Sensitivity	49	60%	1
Deforestation	24	29%	2
Trash (Solid Waste)	16	19.5%	3
Water Contamination	5	6%	4
Sewage Waters or Gray Waters	4	5%	5
Other*	2	2%	6
Soil Erosion	1	1%	7
Pesticide Poisoning	0	0%	8

* Other problems written in by survey respondents were: abuse of aerosols and waxes; poverty impedes respect of natural resources and their rational use.

Several teachers added comments to this portion of the survey. These included:

- I’ve chosen one but these are all problems that are very important. (60E)
- The lack of actual understanding about the environment. (34B)
- It must be considered that all of these problems face us in our communities. This is a big concern because each day we become more defenseless. (1E)

Generally, the results from the teacher survey that are relevant to the first subproblem indicated that educators recognize similar environmental problems as do the individuals interviewed. However, it is interesting that teachers name “lack of environmental sensitivity or

consciousness” as the number one problem, followed by solid waste and deforestation, the top two most frequently mentioned items in the personal interviews, the documentary review, and the focus group results. Teachers seem to be more conscious of the lack of environmental sensitivity in their students and in community members, perhaps because teachers may feel that sensitivity to and consciousness of the environment are prerequisites for learning about the environment. An interest in the subject and understanding of the urgency must first be present before the complicated issues, such as deforestation, solid waste, and water contamination, can be addressed.

3. Greatest Barriers to Environmental Education in the Formal Sector

The greatest barriers to environmental education in the formal sector were addressed through question number six on the teacher survey. The question read, “What is the greatest limitation to teaching about the environment in your classes? (Please check one.)” The answer options given were: lack of planning time; lack of teaching time; lack of environmental education training; lack of environmental education resources; and other (please describe). Although teachers were asked to choose one answer, many chose more than one. Because of this, percentages were calculated using the total number of answers indicated; therefore, the total number of answers is higher than the actual number of teachers who participated in the study. The answers to this question fell out in the manner described in Table 4-4.

Table 4-4: Greatest Barriers to Teaching about the Environment as Indicated on the Teacher Survey (Percentages calculated based on a total of 122 mentions by 83 subjects.)

Barrier	Number of Mentions	Percentage	Ranking
Lack of environmental education resources	48	58.5%	1
Lack of environmental education training	42	51%	2
Lack of planning time	12	15%	3
Lack of teaching time	10	12%	4
Other	10	12%	4

Some of the teachers provided additional comments on barriers to environmental education.

- There has to be completion of an educational program, but [environmental education] is not an area such that gives substantive completion [through formal degree programs]. (75I)
- I don't know of any environmental education instructors and, until this year, haven't advanced this education. (44E)
- The theme isn't specifically included as content in specific programs or classes. (42E)
- Little interest in teaching about conserving our environment. (12A)
- Little instruction on this topic and few resources on it. (29E)

According to the teachers surveyed, the greatest barriers to teaching about the environment in their classes were directly linked to the availability of training in and resources on the environment and environmental education. The other two barriers (lack of teaching time and planning time) were substantially less important.

4. Factors That Would Improve the Level of Environmental Education in Carazo

Factors that would help improve the level of environmental education were addressed through question number seven on the teacher survey. The question read, "What would most encourage you to teach about the environment in your class? (Please check the two that you consider the most appropriate.)" The answer options given were: more environmental education training; more planning time; time during the school day assigned specifically for teaching environmental education; more access to environmental education resources; more time for teaching the required subjects; an after-school program focused on environmental problems and activities; and other (please describe). Although teachers were asked to choose two answers, many chose more than two. Because of this, percentages were calculated using the total number of answers indicated. It is also important to note that the total number of answers is at least twice the number of teachers who participated in the study as each teacher chose at least two factors.

Table 4-5: Factors That Would Encourage More Teaching about the Environment (Percentages based on a total of 167 mentions by 83 subjects.)

Factor	Number of Mentions	Percentage	Ranking
More environmental education training	59	72%	1
More access to environmental education resources	44	54%	2
Time during the school day assigned specifically for teaching environmental education	28	34%	3
After-school program focusing on environmental problems and activities	24	29%	4
More Time for Teaching the Required Subjects	5	6%	5
Other	4	5%	6
More Planning Time	3	4%	7

Some of the other factors that were mentioned included:

- Eye-catching materials. (19G)
- Include it in the MED syllabus and it will be part of more classes, like as part of Spanish, math, social studies, etc. (30E)
- Tours of parks, forests. (31E)
- Films. (69A)

The teachers' overwhelming response was that they would like to receive more environmental education training, followed by more access to environmental education resources. These answers are in sync with the answers given to question number six (the greatest barriers to environmental education in Carazo). In that question teachers also stated that the greatest barriers to including education about the environment in their classes was lack of environmental education training and resources.

5. Summary of Teacher Survey Questions Relevant to Subproblem One: Identifying Environmental Education Needs in Carazo

When looking at the totality of data gathered through the teacher surveys with regard to identifying environmental education needs in Carazo, one particular need becomes startlingly clear: the need for teacher training. The results from the teachers' definitions of environmental education indicate that the majority of the teachers did not have a clear understanding of what environmental education was. They had an idea that environmental education is about preserving and conserving the environment. They believed that it should impart some sort of knowledge about the environment and how humans depend on it. They indicated that one of the most important aspects of environmental education is understanding all the benefits that humans gain from it and how we should protect it in order to continue reaping its benefits.

The teachers themselves recognized the lack of training in environmental education, a barrier that they believed to be significant. One hundred percent of the teachers surveyed said that, yes, they believe it is important to teach about the environment. They also indicated that the lack of training was the second greatest barrier to including more environmental education in their classrooms; and 38% of the teachers indicated that more environmental education would be an influential factor in including more environmental teaching in their classes.

A second important limitation noted by the teachers was the lack of environmental education resources. This was listed as the number one limitation to teaching about the environment and the number two factor that would increase the level of environmental education in their classrooms. This factor will be discussed in more detail under the compilation of data that addresses subproblem three—environmental education resources available in Carazo. (See section 4-III-B in this chapter.)

Finally, the environmental issues that teachers feel are the most important to address through environmental education are headed up by a lack of environmental sensitivity and consciousness. Following closely behind this problem are concerns about deforestation and solid waste, both indicated as critical issues to addressed by the personal interview subjects, focus group participants, and in the review of the related literature. The teachers are unique, however, in their heightened concern regarding the lack of environmental sensitivity in the population. This may derive from the fact that the teachers work one-on-one with students on a daily basis and understand that people must be predisposed to being interested in and caring about an issue before they are willing to learn more about it and, eventually, take action to work toward solving it.

C. Results from Review of Written Materials

In reviewing the documents produced regarding the environment and environmental education in Nicaragua in general, as well as Carazo specifically, the environmental issues discussed were similar to those mentioned in the personal interviews and teacher surveys. (For a comprehensive listing of documents reviewed to collect data for this portion of the study, see Table 3-2: Primary and Secondary Data Sources Reviewed.)

1. Peace Corps' "Draft Environmental Action Plan"

The Peace Corps conducted a survey to develop its draft action plan, before beginning environmental work in Nicaragua in 1995. To determine the most critical environmental problems that Nicaraguans wanted to see addressed through environmental education programs, the Peace Corps gathered information from people and organizations around the country. The participants in developing the Peace Corps' original action plan included more than 1,400 government and non-governmental groups at the local (municipal) level, with representatives from 89 of the 143 municipalities contributing ideas and suggestions.

The community-level representatives determined deforestation and water contamination to be the two most critical environmental problems that needed immediate attention. The other serious problems that were recognized included: lack of environmental education, forest fires, soil erosion, lack of urban planning, and environmental pollution.

Based on these identified problems, the Peace Corps then worked with community-level consultants to select the following priority actions to be addressed through work by Peace Corps volunteers:

1. **Programs** involving reforestation, environmental education, and environmental law.
2. **Projects** involving training and technical assistance, potable water, institutional strengthening.
3. **Promotion** of municipal self-reliance, forest management for employment, soil conservation, environmental sanitation, watershed management, formation of civil brigades for environmental protection, clarification of land tenure, relocation of market facilities, domestic sanitation (latrines), waste treatment.

(Peace Corps/Nicaragua, 1995)

In relation to subproblem one, the formative evaluation performed by the Peace Corps determined that environmental problems in Nicaragua, especially deforestation and water contamination, should be addressed through reforestation, environmental education, and environmental law programs. These programs should have a strong training focus and provide technical assistance. Additionally, the Peace Corps promotes self-reliance in the areas in which they work by developing programs that involve community stakeholders and local counterparts, and address critical local issues.

2. MAN's "Approval of the General Environmental and Natural Resources Law"

Before drafting the General Environmental Law, MAN conducted research to gather information on Nicaragua's most serious environmental problems. The three fundamental problems described through this research and focused on in their publication, "Approval of the General Environmental and Natural Resources Law" (1997), were:

- 1) Heightened level of deforestation that has reached a rate of 100,000 to 150,000 hectares annually.
- 2) Contamination of the country's main water sources.
- 3) Soil contamination by chemical residues left over from fertilizers and insecticides.

Another aspect stressed in MAN's document is the lack of legal controls and enforcement. MAN focuses on the importance of including numerous national government, non-governmental, and civil groups in the development of strong environmental regulations. The laws must also reflect Nicaragua's most critical environmental problems. "Sensitize the major national groups to the importance of environmental ideas. This includes the civil society, and the political and governmental sectors. Develop a proposal for the draft design of the environmental law, appropriately addressing the national necessities," (Mairena, 1997). Since the MAN guide was published, the General Environmental Law was developed and put into effect, with MAN being one of the groups in the forefront assuring that citizen input was gathered and utilized.

Echoing what was said in the Peace Corps document, MAN found the two most critical environmental issues to be deforestation and water contamination. MAN also promoted the idea that environmental law reform is needed and that enforcement is key to prevent the further destruction and deterioration of Nicaragua's natural resources.

3. Santa Teresa's "Document on Environmental Education in the Municipality of Santa Teresa: Sub-Commission on Environmental Education"

In the document developed by the municipality of Santa Teresa's environmental commission, several critical environmental problems facing Carazo, and Santa Teresa in particular, are detailed. The document divides the listing of concerns into environmental problems affecting the municipality's natural resources, and those that are termed, "Principal Environmental Problems of the Municipality of Santa Teresa."

The natural resources issues fall into the following two categories:

- 1) Many species of flora and fauna that live in Santa Teresa are endangered. [The main causes of this are] inappropriate development policies created and supported by the government authorities; and, economic problems of the peasants compound the environmental problems.
- 2) Soil erosion and loss of soil resources. [The main causes of these are] lack of environmental education in rural communities and the civil society as a whole; the critical economic situation of the country and the fact that much of the urban and rural poor lives in extreme poverty; and the lack of control and regulation of natural resources by the state.

(COMAREN, 1997)

The "Principal Environmental Problems of the Municipality of Santa Teresa" are divided into three categories: hygienic/sanitation problems, contamination, and health and hygiene problems. These categories are further broken down as follows:

- 1) Hygienic/Sanitation Problems: hidden trash dumps; no sewage/drainage system for residential sewage and rainwater run-off; lack of hygiene in homes; lack of potable water in poor homes; lack of wells and potable water.
- 2) Contamination: poisoning of rivers for fishing; contamination of freshwater springs from agricultural use (pesticides, fertilizers); soil erosion; deforestation; inappropriate agricultural practices.
- 3) Health and Hygiene Problems: lack of resources of MED and MINSAs; lack of hygiene in the home; contaminated water from agricultural use and sewage water; lack of resources to obtain food; non-existence of sanitary sewers; lack of education of the population; unsanitary slaughterhouses; and lack of facilities to deal with solid or toxic waste.

(COMAREN, 1997)

4. MARENA's "Methodological Guide for Determining Priorities for Environmental Action for the Ecological Service of Secondary Students"

In the document produced by MARENA to instruct schools and municipalities on developing programs to fulfill the "Ecological Service" requirement, several environmental problems are recognized as being universal throughout Nicaragua. These include: loss of native species of flora and fauna, soil erosion, and contamination of freshwater springs. MARENA also provides suggestions for action projects based on what is called "a general understanding of national level problems" and the two mentioned are reforestation and cleanliness. (MARENA, April 1997)

5. Summary of Review of Written Materials Relating to Subproblem One

From the review of local documentary sources, it can be surmised that, once again, deforestation, water contamination, and solid waste management are among the top concerns in Nicaragua. An interesting addition, when reviewing these documents, is the emphasis on the connection between the country's economic situation and natural resource use. Poverty, health, and natural resource depletion are inextricably linked and all must be taken into account when looking at the causes and effects of critical environmental issues in Carazo.

D. Results from Focus Group

A focus group conducted in spring 1997 by Carazo's Environmental Education Council set out to determine problems and alternatives to be worked on by environmental education in Carazo. (For a listing of focus group participants, see Appendix K.) Instead of choosing one specific problem, the focus group developed a list of eight issues they felt were especially critical to address. These problems were also matched with causes, effects, and alternatives described by the focus group participants. Table 4-6 summarizes information derived from the results of the focus group. Only information that directly relates to subproblem one (Critical Environmental Problems) is included in this summary of the focus group results. (For the full listing in Spanish of the "Problems and Alternatives to be Worked on through Environmental Education," see Appendix K.)

Table 4-6: Most Critical Environmental Problems, Causes, and Effects as Determined through the Carazo Environmental Education Commission's Focus Group (May 23, 1997)

Problems	Causes	Effects
Lack of Environmental Education for the Population	Poor educational habits; influence of propaganda; lack of understanding of the importance of the environment; the economic situation.	Trash dispersion; destruction of soil and plant resources; deforestation; contamination; poverty and poor health due to the deteriorating environment; inappropriate use of pesticides.
Ineffectiveness of the Territorial Environmental Committees	A lot of bureaucracy.	Lack of general education in the territory.
Lack of a national environmental education strategy.	The importance of making a change in the system of production is not understood.	The population doesn't understand what suitable and productive uses entail for an improved environment.
Lack of consciousness and understanding of natural resources and the environment.	Information is poorly steered toward the rural population. Lack of training.	Irrational use of natural resources. Loss of biodiversity. Erosion.
Lack of hygienic habits	Little family or social training.	Poor management of solid waste. Sickesses.
Inappropriate use of pesticides.	Lack of understanding of their use and management. Non-compliance with laws that don't allow the use of certain prohibited pesticides.	Environmental contamination. Intoxication. Phytotoxins.
Lack of coordination between different organizations that work for the environment.	Lack of communication.	Waste of human and financial resources.
Lack of mechanisms for identifying problems and solutions.	Absence of organizations that assume responsibility.	Poor use of soil. Deforestation.

Once again, the problems of solid waste, deforestation, and soil erosion emerge as environmental problems to be addressed through environmental education efforts. Interestingly, many of these environmental problems are couched in hygienic or health concerns.

In another vein, there are political and coordination concerns that arose from the focus group, which did not come up as strongly in the personal interviews and documentary reviews, and do not surface at all in the teacher surveys. The lack of environmental education programs, the lack of a national environmental education strategy, the lack of coordination of organizations

working on environmental issues, the ineffectiveness of territorial environmental commissions, and the lack of mechanisms for identifying environmental problems and solutions are major environmental problems, according to the focus group participants. (For a list of focus group participants and full description of focus group outcomes, see Appendix K.)

E. Summary of Results Relating to Subproblem One: Environmental Education Needs in Carazo

This study's first subproblem was to identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations.

The first step in identifying environmental education needs was to define and describe the environmental problems in Carazo, and to use these problems as a basis for determining what kinds of programs and projects should be underway to deal with them. Drawing from the results of the personal interviews, teacher surveys, documentary sources review, and the focus group outcome, the resounding environmental issues seem to be deforestation, water contamination, solid waste, and a lack of environmental sensitivity. Interestingly, these problems are all tied together and can be attributed to several root causes.

The teachers recognized the number one root environmental problem as being the lack of environmental sensitivity. This lack may lead to actions that may be strong contributing factors to the other environmental problems highlighted. A lack of environmental sensitivity also indicates a lack of understanding or interest in how the entire ecosystem is intricately tied together. Deforestation in and of itself has many severe consequences—not the least of which is water contamination. Extensive and excessive run-off from dry and deforested areas can lead to further solid waste management issues as the waste is easily transported from one area to another, by way of water swiftly running off of denuded forest land.

The second step in identifying environmental education needs in Carazo was to look at what people perceived to be the current barriers to environmental education in the department; and, on the other side of that same coin, what factors were thought to have the most potential for increasing environmental education in the department. Interestingly, the greatest barriers were not necessarily directly matched by the factors perceived to be those that would increase environmental education. The recurring themes of barriers to environmental education were lack of time; lack of funding; lack of coordination between organizations/agencies and environmental education programs; and lack of adequate teacher training. The most frequently mentioned

factors to increase the level of environmental education were to increase teacher training; increase communication and cooperation between government agencies; and, as mentioned by teachers, to set aside time during the school day specifically for teaching environmental education, as well as increased access to environmental education resources. (The lack of and poor distribution of environmental education resources is discussed in more detail under section III-C of this chapter discussing personal interview and survey results regarding environmental education resources available in Carazo.)

Teacher training was recognized as a critical need by teachers as well as representatives from government and non-governmental agencies on the national, departmental, and municipal levels. Non-Nicaraguan interview subjects indicated that they would like to see training on active methodologies and time management included as well as on specific environmentally-related topics. The teachers expressed interest in including more environmental education in their classrooms if they were given more training and were provided with a more comprehensive understanding of environmental education.

As it stands, the teachers' understanding of environmental education is quite limited. While most teachers verbalized a strong preservation/conservation component and environmental knowledge components, very few recognized the need for the other traditional "building blocks" of environmental education such as awareness, attitudes/values, citizen action skills, and citizen action participation. These additional aspects are all crucial and they must be included in teacher training programs developed for Carazo's teachers by environmental education agency and organization representatives.

In summary, while there are an endless number of programs and topics that could and eventually should be addressed through environmental education in Carazo, an important point that must be remembered is that, above all, the programs must be realistic, implementable, and based on the reality of the citizens' needs. The foremost needs as indicated by this study's participants, who ranged from national to local level representatives, from government agencies, NGOs, and individual schools, were to begin with increased teacher training. The topics these participants were most adamant about addressing were deforestation, water contamination, solid waste management, and the lack of environmental sensitivity and awareness.

II. Subproblem Two: To identify and describe the design and perceived success of environmental education programs currently underway in Carazo.

Before Carazo's environmental education commission can make effective decisions regarding a strategic environmental education plan for the department, the commission must be aware of programs that are currently underway as well as the successes and failures of those programs. To address the subproblem of environmental education programs currently underway in Carazo, as much information as possible was gathered on environmental education programs in Carazo, the organization(s) offering the programs, the focus of the programs, and their perceived success. This information was gathered by looking at information that directly addressed environmental education programs in operation in Carazo.

The results gathered from studying subproblem two, environmental education programs currently underway in Carazo and their perceived success, assisted in guiding recommendations made about future implementation of environmental education programs. The indicators of the current programs' strengths and weaknesses can also provide feedback for aspects that should or should not be incorporated into future programs. Finally, the information gathered through this subproblem can help to guide any changes in the direction, offering, or administration of programs currently underway.

Because of the nature of subproblem two, the data collection methods are described separately. The results are then presented in aggregate, with information from all data collection sources being combined under the description of each type of program. Finally, the general categories of "Problems with Environmental Education Programs Currently Underway," "Successes of Environmental Education Programs Currently Underway," "Barriers to Environmental Education in Carazo," and "Factors to Increase the Level of Environmental Education in Carazo" are discussed in this section as well.

The data related to subproblem two is presented in the following manner:

- A. Data Gathering Sources
 - 1. Personal Interview Results
 - 2. Teacher Survey Results
 - 3. Documentary Source Review Results
 - 4. Focus Group Results
- B. Environmental Education Programs Currently Underway—Topics, Participants, Funders, Strengths, and Weaknesses
 - 1. Formal Education Programs (K-12 and University)
 - a) Ecological Brigades
 - b) Required 60 Hours of Ecological Service Work
 - c) Programs Working Directly with Students and Teachers in Schools

- d) Teaching Currently Underway as Provided by Teachers in Formal Settings
- e) Curriculum Guides
- f) University-Level Programs
- 2. Teacher Training Programs
 - a) Teacher Survey Responses Regarding Teacher Training in Environmental Education
 - b) Interview Responses Regarding Teacher Training in Environmental Education
 - c) Summary of Teacher Training Programs
- 3. Environmental Campaigns and Parades
 - a) Description of Environmental Campaigns and Parades
 - b) Successes of Environmental Campaigns and Parades
 - c) Problems with Environmental Campaigns and Parades
 - d) Summary of Environmental Campaigns and Parades
- 4. Government Sponsored Programs and Initiatives
 - a) Description of National Environmental Education Meetings
 - b) Description of National Strategic Plan for Environmental Education
 - c) Description of Departmental Environmental Education Commission
 - d) Summary of Government Sponsored Programs and Initiatives
- 5. Technical Assistance Programs
 - a) Description and Successes of Technical Assistance Programs
 - b) Problems with Technical Assistance Programs
 - c) Summary of Technical Assistance Programs
- 6. Issue Focused Technical Assistance Programs
 - a) Deforestation Issues Addressed through Technical Assistance Programs
 - b) Solid Waste Management Addressed through Technical Assistance Programs
- 7. Environmental Education and Interpretation Programs in Natural Areas of Carazo
 - a) Interpretive Programs Offered at Natural Areas
 - b) Interpretive Training in Natural Areas
- C. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 - 1. Successes of Environmental Education Programs Currently Underway in Carazo
 - a) Involvement of Students and Teachers in Programs
 - b) Involvement of Local Community Members in Programs
 - c) Involvement of Government Personnel in Programs
 - d) Summary of Successes of Programs Currently Underway in Carazo
 - 2. Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Lack of Knowledge, Time, and Interest of Program Leaders
 - b) Lack of Sustainability of Foreign or NGO-supported Programs
 - c) Lack of Funding and Resources for Environmental Education Programs
 - d) Lack of Planning and Coordination Among Organizations and Agencies Involved in Environmental Education
 - e) Lack of Government Commitment to Environmental Education
 - f) Lack of "Real Life" Relevancy in Environmental Education Programs
 - g) Lack of Follow-through and Evaluation of Environmental Education Programs
 - h) Summary of Problems with Environmental Education Programs Currently Underway in Carazo
- D. Summary of Results Relating to Subproblem Two: Environmental Education Programs Currently Underway in Carazo
 - 1. Description of Environmental Education Programs Currently Underway
 - a) Formal Education Programs (K-12 and University)

- b) Teacher Training Programs
 - c) Campaigns and Parades
 - d) Government Sponsored Programs and Initiatives
 - e) Technical Assistance Programs
 - f) Issue-focused Technical Assistance Programs
 - g) Environmental Education and Interpretation Programs in Natural Areas of Carazo
2. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Successes of Programs Currently Underway
 - b) Problems with Programs Currently Underway

A. Data Gathering Sources

The results in this section are presented in the following manner:

- A. Data Gathering Sources
 1. Personal Interview Results
 2. Teacher Survey Results
 3. Documentary Source Review Results
 4. Focus Group Results

1. Personal Interview Results

Subproblem two was addressed in the personal interviews by asking the subjects if their organization or agency had any environmental education projects currently underway in Carazo. Subproblem two was also addressed by asking the interview subjects if they had knowledge of any other organizations or agencies offering environmental education programs in Carazo. The perceived success of these programs was determined through asking the interview subjects if they believed that the programs currently underway were successful or not. Some interview participants were asked about what they believed the specific strengths or weaknesses of the programs were. Also noted was the specific audience of the program, such as K-12 students, university students, teachers, community members, and so on.

2. Teacher Survey Results

In the teacher surveys, subproblem two was addressed through asking about training received in the area of environmental education. Questions on environmental education training helped determine whether environmental education training programs for pre-service and in-service teachers existed, whether the programs were widely publicized, what kind of organizations and agencies provided and supported training programs, and how many teachers had actually attended environmental education training programs. Additionally, results from the

teacher surveys were used to determine to what extent and in what manner teaching about the environment was being included in classroom teaching in Carazo.

3. Results from Review of Written Materials

Through reviewing documentary sources available specifically focusing on Carazo, as well as those that discussed environmental education in Nicaragua more broadly, programs currently underway were highlighted. The documentary sources provided indications about which programs were going on, what the original intention behind these programs was, the participants and funding organizations/agencies of the programs, and the perceived success of the programs.

4. Focus Group Results

The focus group did not specifically address programs currently underway in Carazo so information from the focus group was not used in relation to this subproblem.

B. Environmental Education Programs Currently Underway in Carazo—Topics, Participants, Funders, Strengths, and Weaknesses

The data in this section will be presented in the following manner:

1. Formal Education Programs (K-12 and University)
 - a) Ecological Brigades
 - b) Required 60 Hours of Ecological Service Work
 - c) Programs Working Directly with Students and Teachers in Schools
 - d) Teaching Currently Underway as Provided by Teachers in Formal Settings
 - e) Curriculum Guides
 - f) University-Level Programs
2. Teacher Training Programs
 - a) Teacher Survey Responses Regarding Teacher Training in Environmental Education
 - b) Interview Responses Regarding Teacher Training in Environmental Education
 - c) Summary of Teacher Training Programs
3. Environmental Campaigns and Parades
 - a) Description of Environmental Campaigns and Parades
 - b) Successes of Environmental Campaigns and Parades
 - c) Problems with Environmental Campaigns and Parades
 - d) Summary of Environmental Campaigns and Parades
4. Government Sponsored Programs and Initiatives
 - a) Description of National Environmental Education Meetings
 - b) Description of National Strategic Plan for Environmental Education
 - c) Description of Departmental Environmental Education Commission
 - d) Summary of Government Sponsored Programs and Initiatives
5. Technical Assistance Programs

- a) Description and Successes of Technical Assistance Programs
- b) Problems with Technical Assistance Programs
- c) Summary of Technical Assistance Programs
- 6. Issue Focused Technical Assistance Programs
 - a) Deforestation Issues Addressed through Technical Assistance Programs
 - b) Solid Waste Management Addressed through Technical Assistance Programs
- 7. Environmental Education and Interpretation Programs in Natural Areas of Carazo
 - a) Interpretive Programs Offered at Natural Areas
 - b) Interpretive Training in Natural Areas

From this study, it is clear that numerous environmental education programs are currently underway in Carazo. These programs range from national-scale, government sponsored programs (like the required 60 hours of ecological service in high schools) to local, grassroots level programs such as community environmental brigades. Multiple aspects of these programs (such as topics, participants, funders, strengths, and weaknesses) are explored together as each aspect has an influence on the other. In this section, the topic, participants, and funders of the programs currently underway are discussed, as well as the strengths and weaknesses of these programs.

Table 4-7: Frequently Mentioned Environmental Programs Currently Underway in Carazo*

(Arranged alphabetically by program name.) *This is not intended to be an exhaustive list of all environmental education programs underway in Carazo; rather, it provides an overview of programs frequently mentioned by the study participants.

Name and Type of Organization	Key Audience of Program	Organization Implementing Program	Funding Source	Strengths	Weaknesses
60 Hours of Ecological Service (Described in section II-B-1-b of this chapter.)	High school seniors	MED, High Schools	High Schools, MED, sometimes local environmental education commission	Ensures that every high school senior will become involved with an ecological service project; Demonstrates a governmental commitment to environmental education	Projects not student-directed/usually assigned by teachers; Lack support of local environmental education commission in development of projects; Not always true environmental education projects
Campaigns and Parades (Described in section II-B-3 of this chapter.)	General public (participants are usually school-aged children)	Ecological brigades; high school seniors performing 60 hours of ecological service	MED, MARENA, schools, students hold fund raisers	Raise public awareness of environmental issues; fit in well with Nicaraguan social structure and festival events; get students interested in and excited about environmental issues	Usually one-shot efforts without carry-over into “real life”; topics are not usually chosen by students so learning is teacher-directed
Ecological Brigades (Described in section II-B-1-a of this chapter.)	Usually high school students; sometimes elementary school students or community members	High Schools; Brigade leaders are usually science teachers	Schools (sometimes with additional MED or MARENA funding)		Projects usually chosen by teachers; Lack of time and interest on the part of student participants and leaders; Not always true environmental education projects

Interpretive and School Programs in Natural Areas (Described in section II-B-7 in this chapter.)	School children, community members	MARENA, GreenCOM	MARENA	Teach about the environment <i>in</i> the environment; expose visitors to the natural areas of their area/country; instill a sense of wonder, awe, and appreciation for natural areas	Majority of school groups cannot afford to visit these natural areas because of transportation costs and time constraints; programs are usually one-shot efforts with no pre-visit or post-visit information
Programs working directly with students and teachers in schools on environmental education (Described in section II-B-1-c of this chapter.)	K-12 students and teachers	Peace Corps, FUNCOD	Peace Corps, FUNCOD, MARENA, MED, MAN	Programs usually staffed by paid, full time personnel; program providers have access to resources; instigate the multiplier effect	Not usually sustainable after the foreign or NGO worker has left the area; no counterparts for projects; no follow-through
Teaching about the environment included in formal classroom subjects (Described in section II-B-1-d in this chapter.)	K-12 teachers	N/A	N/A	Teachers have access to students for an extensive number of years so school is a constant place to provide environmental education	Teachers are not trained in environmental education; minimal access to environmental education resources; little time devoted to environmental topics
Technical Assistance Programs and Issue-Focused Technical Assistance Programs (Described in section II-B-5 and 6 in this chapter.)	Community members, farmers, natural resource workers	POSAF, PROSESUR, Farmer to Farmer, MARENA	MARENA, World Bank, Inter-American Development Bank	Reach a non-traditional audience; spread environmental issues information to agricultural producers and natural resource users	Don't formally include an environmental education component although much of the work being done in this arena <i>is</i> environmental education

1. Formal Education Programs

The most frequently mentioned environmental education programs underway in Carazo fall under the coding category of “K12” or K-12 formal education programs. (In addition to K-12 programs, university-level programs are also included in this formal education discussion section.) Within the K-12 formal education category, three types of programs were mentioned consistently. These were ecological brigades, the 60 required hours of ecological work on the high school level, and classroom programs/training provided by national and foreign NGOs working directly with students and teachers in schools. Other formal education programs mentioned in this section include programs offered by teachers in formal education settings, university-level programs, and curriculum guide development.

a) Ecological Brigades

i) Description of Ecological Brigades

The ecological brigades were mentioned by many interview subjects. Ecological brigades are high school environmental clubs that work on projects in the local communities. The idea is also spreading to elementary schools and community groups. Ecological brigades are voluntary groups that usually perform their service work after school or on weekends and are often led by the school’s science teacher(s).

- Within [MARENA], we have had a variety of programs with the youth of Nicaragua in what is called “Brigadas Ecologicas Municipales” (BEM)—Municipal Ecological Brigades. BEM are very popular and have had many good results. (I, 8, 1) (2.BRIG) (8.12)
- . . . one of the most important things [MED is] involved with as far as the environmental education theme or issue is the organization of the ecological brigades at the primary level. (I, 11, 2) (2.BRIG) (2.ECO; 8.K; 8.12)
- So, I tried to find some people that wanted to do things in the community and that’s when we formed the municipal brigade, which is some kids in high school but most are either in their last year or they’re in the university. And they list the problems and they think up the solutions. (VI, 3, 2) (2.CBRIG) (XX)
- One of the results from these talks [given by the Jinotepe mayor’s office] is that after the talks [we] have formed ecological brigades and [we] keep working in the environmental sector, incorporating new students and strengthening all the time so [we] see that as a good possibility for EE. (III, 21, 2) (2.BRIG) (XX)

ii) Successes of Ecological Brigades

Ecological brigades work on various environmental topics and community issues that vary from school to school and brigade leader to brigade leader. One of the mentioned successes of these programs is that they often work on spreading important environmental information to the community.

- The way it stands right now on the itinerary, the ecological brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash [collection] is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (2.BRIG) (2.COMP; 2.TRAS; 8.12; 8.COMM; 14.ALC)
- In 1990, [I] organized two brigades formed by 80 students and it was started because [I] felt the need to do something to make people conscious of environmental problems. (VII, 10, 1) (2.BRIG) (XX)

Another success mentioned was that the ecological brigade projects have the potential for getting students seriously involved in environmental issues in the community and can provide a deeper understanding of topics than can be addressed in the classroom.

- But, with the brigades, I've noticed that the kids are changing a lot of their ideas. When we first took them out to plant trees, they were carrying their trees upside down because they weren't *their* trees, they were *my* trees because they were out of my [tree nursery]. But now their attitude has changed a lot—once they started doing more stuff, they had more pride—a lot more pride in their community. (VI, 4, 4) (6.INT) (6.CONN)
- Just the fact that [the ecological brigade members] go out on parades with bands and display signs with things that citizens should do like the importance of managing solid waste properly and not to pollute the streets, don't throw things on the streets, the importance of environmental education—that has the effect of making some people conscious of the problem. (VII, 10, 3) (2.PAR) (XX)
- For example, during Easter week, young people [in the ecological brigade] work on the heavily visited beach areas educating vacationers and residents to keep the waters and beach itself clear of garbage. (I, 8, 1) (2.CAM) (2.TRAS)
- [The ecological brigade members] are working on what's called the Plan Playa, which is the type of project that takes place during the summer vacations and the brigades go to the different beach resorts around the area, around here on the coast, and they try to train the tourists to help manage the waste—not to throw it on the beaches. The activities that they develop—picking up the waste and all that—they also give talks to the different people that are there—telling them about the negative effects of throwing the waste on beaches. (VII, 10, 2) (2.CAM) (2.TRAS)

iii) Problems with Ecological Brigades

Although ecological brigades are present at many high schools, and although the idea behind them is to get students seriously involved with local environmental problems, many interview subjects mentioned various problems with ecological brigade programs. These weaknesses included a lack of student direction and interest in the projects pursued by the brigade; a lack of commitment on the part of the brigade leader; a lack of funding for projects; and a lack of understanding of projects that include all aspects of environmental education such as environmental awareness, knowledge, attitudes and values, citizen action skills, and citizen action participation.

- Like, if MARENA were having an activity, the teacher would call the kids on the list and tell them they were having this activity. Or, they might do one little project in the school but, rarely ever did they have meetings where the whole brigade would get together and discuss what problems there were and what they would do about them or would they have projects. (VI, 3, 2) (6.INT) (XX)
- So, the kids liked the idea of working on the weekends—they always participated then. But as Peace Corps, we need to work with other Nicaraguans—and I couldn't get the teachers to do it. Well, I got one teacher to do it maybe two or three Saturdays and that was all and he no longer wanted to do it. He resigned from being the Brigada leader. And so then I was not going to end up like I did with the Mayor's office—doing all of the work and not having any support. (VI, 3, 2) (6.COUN) (XX)
- [I am] mentioning again how scarce the resources are and how [the ecological brigades] should try to do more things [but] the salary that [teachers] get is very little so the things [teachers] do—they don't do it because they want to get an economical reward but . . . because they want to have a more beautiful environment. (VII, 10, 4) (6.\$) (10.\$)

Another problem noted with brigade activities is that they often center around a single campaign or parade event, without any preliminary student preparation or follow-up.

- [The ecological brigade] was more or less like something on paper—or something the kids, like when there was a parade, they would participate in the parade as the ecological brigade. (VI, 3, 2) (2.PAR) (XX)
- [Ecological brigade members] also participate in several parades that they have organized. They have parades in the street where they display ecological activities and promote ecological actions for the citizens to do and that's about it. (VII, 10, 3) (2.PAR) (XX)

iv) Summary of Ecological Brigade Programs

In summary, ecological brigades are commonly found in high schools around Nicaragua and Carazo. The programs successfully involve high school students in the sense that they personally choose to be involved in the efforts of the brigade. However, many of the projects undertaken by the brigades are chosen by the teachers and administrators, lack a connection to “real life” outside of the school grounds, and do not contain multiple components of environmental education; rather they focus on a simple schoolyard clean-up effort, or one-shot parade or campaign programs.

b) Required 60 Hours of Ecological Service Work

i) Description of the 60 Hours of Ecological Service Work Program

Developing out of concerns voiced in the 1992 “General Environmental and Natural Resources Law” and put into effect by MED in 1996, there is a national requirement that all high school seniors must complete 60 hours of ecological service work before graduating. This work requirement was mentioned by many of the interview participants as it is widely understood and respected throughout the country. Data were also gathered from a document produced by MARENA that provides guidelines for schools in developing the projects on which students will complete their 60 hours of ecological work.

ii) Successes of the 60 Hours of Ecological Service Work Program

The program has successes that center around the idea that every student must become involved in some sort of environmental community work. This requirement exposes students to environmental ideas and helps promote environmental projects in the community that can be continued year after year. Additionally, the requirement demonstrates governmental support, affirming that environmental education is an important enough subject to be required as part of the education of each Nicaraguan student.

- One of the good things is that the government passed a law that high school students, in order to graduate, they have to donate 60 hours of their time to ecological social service. [They] must get involved with ecological activities and must get the permission of the Ministry of Health and Ministry of Education and approval of the institution. (II, 1, 8) (2.ECO) (XX)

- Right now [MED] is requiring 60 hours of community ecological high school work in order for students to graduate so [Peace Corps] volunteers are supporting the teachers to do environmental work in the community—using the high school. (VI, 13, 4) (2.ECO) (XX)
- And, as far as the students are concerned, they have the 60 hours of environmental work, which I believe could really be taken advantage of by the community. (VI, 3, 4) (2.ECO) (XX)

If implemented properly, the requirement can take advantage of valuable community resources and involve students in the decision-making process. The students, in conjunction with the teacher, the principal, and the local environmental education commission, can research environmental problems being faced by their department or municipality and develop action plans to address these problems.

Each school will define an area of action within their community. This area can be located around the school or can be a special area, one whose environmental conditions require special attention. (The local authorities can provide direction to the schools in the selection of these areas.)

The work that each school defines depends on three principal elements:

- a) Impact of the activities on the betterment of the environment in the assigned area, directing actions by attacking the problems not the symptoms.
- b) Feasibility of the implementation of the activities, in light of the material resources, human resources, time factors, control, and follow-up. (Here the support of the local non-governmental institutions and organizations must be considered.)
- c) Compatibility of the activities with the reality of the socio-economic and cultural situation of the area.

Each group of students should do a brief analysis of the environmental problems, finally determining the priorities and planning solutions to them. It is important to understand that the work is not predetermined, so it can originate based on the problems of the local community.

(MARENA, May 1997)

iii) Problems with the 60 Hours of Ecological Service Work Program

Problems that have arisen with the requirement of 60 hours of ecological work are similar to those mentioned with the ecological brigades. Often the projects are dictated by the teachers and not student driven, nor are they necessarily based on the needs or wants of the community.

- “We had to go clean up trash.” But that’s not environmental education. They’re not getting any consciousness of what’s going on, they’re not learning anything about the environment or what its needs are and what their place in taking care of it is. They’re just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don’t even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 8) (2.ECO) (XX)
- And a lot of people don’t have the knowledge what it’s for. They think it’s just to get these 60 hours out of the way, work the kids in the school or work them around the school. And one teacher is responsible for thinking up what they’re going to do. (VI, 3, 4) (6.KNOW) (XX)
- Another problem is that with the 60 hours of ecological work a lot of people are left to the mayor’s office and they’re doing street clean up and stuff like that because the teachers don’t know what to make them do. (IV, 20, 5) (6.INT) (6.KNOW)

iv) Summary of the 60 Hours of Ecological Service Work Program

Overall, the 60 hour requirement by MED shows a government commitment to including environmental education in the formal education system. However, although the ministry has tried to lay out specific guidelines that would direct these ecological projects, often the projects do not seem to address the true community needs and do not engage students in learning that can be carried on outside of the school setting.

c) Programs Working Directly with Students and Teachers in Schools

i) Description and Success of Programs Working Directly with Students and Teachers in Schools

Several NGOs are consistently working in schools in Carazo to provide more environmental education training for the teachers and to provide environmental education experiences to the students. The programs are successful in the sense that the programs are usually provided by individuals who are paid specifically to work on environmental education in a formal setting. The providers are often very dedicated and have more access to resources (printed materials, human and financial resources) than do the schools when working through governmental agencies such as MED and MARENA.

- FUNCOD has campaigns in schools such as seminars, presentations, as well as being a pioneer in the organization of ecology clubs since the 1980s, whose goals are to better the environment through reforestation. Example: the campaign to plant the national tree, which

is on its way to extinction, and through this a project has been developed called "Protection and Conservation of National Species," of which 12 [native tree species] are affected. (IV, 15, 2) (2.K12) (2.BRI, 2.REF)

- [Peace Corps volunteers] started working with three schools—one volunteer works with three schools—we work from fourth through sixth grade—that way we cover the grades not covered by MED with the transformation in the curriculum so basically what the volunteers do is support the teachers to incorporate what's in the curriculum into the classroom in a more active, using active methodology, using local knowledge from the students, and incorporating whatever environmental problems are happening and trying to find solutions where students can be involved. (VI, 13, 4) (2.K12) (2.TTNG; 8.K; 8.TEACH)
- Working with schools through an agreement with the Minister of Education (MED), we are working on supporting primary school teachers, mainly in rural communities, to incorporate environmental education which is in the curriculum but is not always implemented. We are doing that in different regions, covering almost all populated Nicaraguan regions. There is a curriculum transformation right now from first to third grade so they are doing/promoting active education and local knowledge and we are working from first through sixth grade so not only including the first three grades who are working with MED but also the upper three grades. (VI, 13, 3) (2.K12) (14.MED; 8.K)
- We're trying to get together themes like garbage, deforestation, overpopulation, an introduction to environmental science, ecosystems, animals, different appreciations for environmental problems—and coming up with different projects—mostly outside of the classroom—going for walks, thinking about the adaptations of different animals and plants. (VI, 12, 3) (2.K12) (8.K)

Another successful aspect of programs working directly in the schools is that the multiplier effect can occur, spreading enthusiasm for and information about environmental education throughout a school. Many of these programs are more than a year in duration, so a relationship with the teachers is established. The agency or organization workers can help the teachers to develop their own active teaching styles and help them to further comprehend the importance of environmental education within the formal school system.

- [Two of the Peace Corps volunteers working in Carazo] can be effective because they're working one on one with the teachers and that's why a lot of [Peace Corps volunteers] now are moving away from forestation projects and moving away from working with MARENA and the mayor's offices and are working straight with the schools in the formal sector. Because they have the network set up and they have somebody that supposedly is responsible for it so like when you work with a teacher for two years teaching them how to incorporate environmental education into their work plan, then they have their work plan written up probably they're going to continue using that work plan with the next year's block. They're going to see, they're going to have worked out the games, they're going to have worked up the activities, they're going to see it's easier for them with this all planned

out, and that they can complete what MED has signed up for them. So I believe that those kind of people are going to be effective in their work in Peace Corps—the ones who are working directly with teachers because that's the one that has a counterpart or a real person that that's the teachers responsibility—they have to get that done and they're interested in doing it or partially interested in doing it. (VI, 3, 9) (7.STU) (2.K12; 7.SCH)

- For example, four months ago I visited a volunteer and we were talking in the common area of a rural community—300 km. from Managua. A second year high school student was serving us food and I asked “What would you like to study?” and it was not intentional at all. What I really was wondering was if she was thinking of continuing her education. She said, “What I really like is working with the environment and working with the trees—learning about the trees and what to do with the trees,” and I said “Botany?” and she said, “Yes.” I know this is because she has received some of the dynamics from the volunteer because I'm sure if I had asked that question two years ago, she wouldn't have said that—probably that she wanted to study but not something about the environment. (VI, 13, 7) (7.STU) (XX)
- I work with two rural schools. They're barrios or small communities right outside of Jinotepe. I work with fourth through sixth grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. The people whom I work with are very active and interested in their community. (VI, 12, 2) (7.LOC) (2.K12; 8.K; 8.TEACH)

ii) Problems with Programs Working Directly with Students and Teachers in Schools

Programs provided by NGOs and international organizations are not necessarily sustainable or effective in the long term. One of the drawbacks of having organization or government agency employees work in classrooms and with teachers is that the process does not necessarily empower the classroom educators, nor is any sort of follow-through ensured. Several Peace Corps volunteers who were interviewed voiced frustration regarding the lack of counterparts for them to work with in the local communities. These volunteers were concerned that the programs on which they worked would not be continued once they left the area.

- A lot of stuff that I do kind of ends up at a dead end and I have to skirt my way around it. It took about three months for me to find teachers to work with because I was just driving myself crazy because I was working with the wrong teachers and they didn't have any interest in the program. I was trying to explain to them “This isn't my program. I'm not going to live here for the next 20 years and do this in your school.” I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just third and fourth graders and just picking out the really good teachers. (VI, 4, 8) (6.FOR) (6.LINT; 6.COUN)
- So I find mostly it's the volunteers that work in the area, and it tends to be the foreign volunteers because they're paid a certain amount of money because that's their job and so they seem to be effective. The problem is that they're not from here so they only stay so

long and then they go home and even though all of the organizations I've seen have good intentions and they want you to work with someone else, the people you're working with either in MARENA or MED or they have other things to do, there's nobody set up for just this problem or just to concentrate on it. So, they seem to be more effective. (VI, 3, 6) (6.FOR) (XX)

- It's really hard—you literally have to sit here and tell people how to do things. I've tried to get the teacher to do some of the activities on her own. I tell her I get these pieces of paper and they say do this activity and I read it and I say I'm going to do this activity and then do it—and she thinks I'm some kind of magic person because somehow I can. And they're all in Spanish. I give it to her and ask if she wants to introduce the activity and she looks at it and acts as if it's a foreign language. I'm not sure what it is—I guess they just kind of feel they have to have some kind of special training to do it. I did go to an in-service training with the teachers and it was pretty interesting how much time we wasted not really doing much. (VI, 4, 6) (6.TNG) (9.INS)

iii) Summary of Programs Working Directly with Students and Teachers in Schools

Programs in the formal school system that are run by outside organizations or agencies are successful at bringing the environmental education experience into the classroom. However, these programs are not necessarily sustainable as the workers are often not able to find counterparts in the local community to continue with leading and working on the programs once the original NGO worker has left.

d) Environmental Teaching Currently Underway as Provided by Teachers in Formal Settings

Although the teacher survey did not ask about environmental education programs in the community or about general knowledge of environmental education programs underway in Carazo, the survey did address the issue of programs currently underway through polling how many teachers were including or had included teaching about the environment in their classrooms. The teachers who said that they included teaching about the environment in their classrooms represent a segment of the formal education population that is providing in-school, formal environmental education programs to students in Carazo.

This section will review results from a two-part question in the survey. The first part of the question asked the teachers whether they had included teaching about the environment in their class(es) and allowed for a simple "yes" or "no" answer. The second part asked, "If you have [taught about the environment in your class], please describe in what manner."

The results from the first part of the question indicated that 95% of the teachers had included teaching about the environment in their class(es). It is interesting to note that 100% of

the teachers who answered question number two, about whether they believed it was important to teach about the environment, answered “yes.” (Note: This percentage may be artificially inflated as the teachers knew that the study was being administered in conjunction with MARENA, which is a known supporter of environmental education throughout the department and country.)

Out of the 95% who said that they had included teaching about the environment in their class(es), 93% (or 77 teachers) provided a description of the manner in which they included the topic.

Table 4-8: Manner in which Teaching about the Environment Was Included in Classroom Teaching According to the Teacher Survey (n=77 teachers)

Manner of Inclusion	Number of Mentions	Percent (n=77 teachers)	Ranking
Inclusion of environmental issues in general (For break down of this by issue topic, see Table 4-9.)	59	77%	1
Inclusion of environmental topics in formal subjects (For break down of this by topic, see Table 4-10.)	54	70%	2
Action components (For break down of this by topic of action, see Table 4-11.)	18	23%	3
Presented in a workshop or speech to the class	9	12%	4
Field studies of the local environment	7	9%	5
Class discussions on environmental topics	4	5%	6
Included as a topic of writing assignments	3	4%	7

* For the full document listing teachers’ responses to this question, see Appendix M, “Teacher Surveys Codes and Results.”

i) Discussion of Specific Environmental Issues with Students in Class(es)

Of the 77 teachers who answered the question regarding in what manner they had included teaching about the environment in their class(es), 59 mentions were made of discussing specific environmental issues with students. Out of those 59 mentions, the greatest percentage of the mentions (24%) reportedly focused on preservation/conservation issues, followed by deforestation (13.5%), cleanliness (12%), and solid waste (10%).

Table 4-9: Environmental Issues Addressed in Carazo Classrooms According to the Teacher Survey (n=59 mentions)

Issue Included	Number of Mentions	Percentage (n=59 mentions)	Ranking
Preservation/conservation issues	14	24%	1
Deforestation issues	8	13.5%	2
Cleanliness issues	7	12%	3
Solid waste issues	6	10%	4
Reforestation issues	5	8%	5
Hygiene issues	4	7%	6
Awareness/sensitivity issues	3	5%	7
General environmental issues	2	3%	8
Ozone depletion issues	2	3%	8
Futures thinking-related issues	2	3%	8
Toxic waste issues or issues pertaining to toxics in the environment	2	3%	8
Animal issues	1	2%	9
Water quality or contamination issues	1	2%	9
Climate change issues	1	2%	9
Air quality issues	1	2%	9

Preservation/conservation issues were overwhelmingly the most common forum in which the teachers reported discussing environmental topics and problems. This follows logically the strong preservation/conservation component the teachers reported when defining environmental education in their own words. (For more about components included in teachers' definition of environmental education, see Table 4-2.) The following are some of the statements teachers offered regarding specific environmental issues that they had included in their class(es).

- Yes, when we approach topics like ecology and evolution, we have a variety of content and activities that include the preservation of the environment, to avoid the destruction and deterioration. (16D) (3.ISS-PC) (3.SCI)
- In a sensible way, concrete to the children, in the first grade we teach them rules of hygiene referring to the garbage, and to love and enjoy nature. We talk about the danger of not taking care of it. (29E) (3.ISS-P/C) (3.ISS-HYG, 3.ISS-SW, 3.ISS-A/S)
- Environmental education is included, orientating children toward the preservation of animals and plants and the danger of extinction. (40E) (3.ISS-P/C) (XX)
- In my case, I give Spanish class lectures about the care and protection of the environment, explaining ways to protect the environment. (76I) (3.ISS-P/C) (3.SPA)

- Teaching the children to care for and protect the plants and the animals—that they should water the plants and not destroy the forests, that if they cut down a tree they should plant three more. (80J) (3.ISS-P/C) (3.ISS-DEF, 3.ISS-REF)

There is overlap, obviously, between the issues about which the teachers reported teaching and the manner in which they presented them. Many of the aforementioned issues were included as teaching about the environment within the context of traditional formal education subjects. The following section describes the use of traditional subjects to include the environmental topics discussed above.

ii) Inclusion of Environmental Education within Traditional Subjects

Of the 77 teachers who answered the question regarding in what manner they had included teaching about the environment in their class(es), 54 mentions were made of including environmental topics within traditional subjects. Out of those 54 mentions, the greatest percentage of the mentions reportedly included teaching about the environment in science classes (44%), followed by civics or social studies classes (15%), and Spanish classes (11%).

Table 4-10: Inclusion of Teaching about the Environment within Traditional Subjects According to the Teacher Survey (n=54 mentions)

Subject	Number of Mentions	Percent (n=54 mentions)	Ranking
Included in science classes	24	44%	1
Included in civics or social studies classes	8	15%	2
Included in Spanish classes	6	11%	3
Infusion or integration into all subjects	5	9%	4
Included in art classes	3	5.5%	5
Included in geography classes	2	4%	6
Included in morals classes	2	4%	6
Included in orientacion laborale*	2	4%	6
Included in math classes	1	2%	7
Included in health classes	1	2%	7

*Orientacion Laborale is a class offered in Nicaraguan primary and secondary schools. Depending on the school, it can include a variety of activities and topics. These range from cleaning of the classrooms and school grounds, physical education type activities, and sometimes environmental education. (One of the Peace Corps volunteers who worked with primary school students said that the time that was given to her to teach environmental education was during the "Orientacion Laborale" class.)

The most popular subject, by far, into which teachers reported integrating teaching about the environment was science. Environmental issues are also quite clearly social issues and the inclusion of them into social studies and civics classes is the next highest mentioned manner of inclusion. The following are some of the statements relating to classes in which environmental topics were included that were offered by the teachers when asked in which manner they had included teaching about the environment in their classes. (For the full document listing teachers' responses to this question, see Appendix M, "Teacher Survey Codes and Results.")

- Yes, when we approach topics like ecology and evolution, we have a variety of content and activities that includes the preservation of the environment, to avoid the destruction and deterioration. (16D) (3.SCI) (3.ISS-P/C)
- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest. At the same time, in the civics, we teach children to take care of and make good use of the community. (20G) (3.SCI) (3.CIV, 3.ISS-AIR, 3.SW, 3.DEF, 3.REF)
- In [the natural sciences], there are certain topics that we cover in fifth and sixth grade that it is necessary that we talk about the preservation of the environment. (30E) (3.SCI) (3.ISS-P/C)
- In the natural science class we emphasize the content that reflects on the care of our environment—besides the problems, activities like the reforestation of trees and plants around the school, visits to the Tropical Museum of Dry Tropical Forests, etc. to gain interest in the environment for the students, compositions dedicated to the conservation of the environment. (36B) (3.SCI) (3.FIE, 3.WRI, 3.ACT-REF)
- Yes. I am a biology teacher and the programs include a lot of teaching about the environment. (51F) (3.SCI) (XX)
- The topic of ecosystems and elements appears and is elaborated on in the natural science classes. Guidelines and a consciousness for protection of the environment are included in it. (73A) (3.SCI) (3.P/C)
- Only in the subject of natural science. (82B) (3.SCI) (XX)
- Yes. For example, doing experiments with both live and dead plants to take note of what the differences are and, many times, handling and observing deteriorating places. (83B) (3.SCI) (3.FIE)

iii) Action Components Included in Teaching about the Environment According to the Teacher Survey

Of the 77 teachers who answered the question regarding in what manner they had included teaching about the environment in their class(es), 18 mentions were made of undertaking action projects with students. Out of those 18 mentions, the top two actions taken were reforestation projects and school or community clean-ups, each taken by 44% of the 18 mentions of action components included.

Table 4-11: Action Components Included in Teaching about the Environment According to the Teacher Survey (n=18 mentions)

Type of Action Project	Mentions	Percent (n=18 mentions)	Ranking
Reforestation project	8	44%	1
Cleaning of school or community	8	44%	1
Solid waste management project	1	5.5%	2
Planting a class garden	1	5.5%	2

Although the number of teachers mentioning that they included an environmental action component in their class(es) was not high, the number was significant enough to warrant attention. The following are some of the statements relating to an action component that were offered by the teachers when asked in which manner they had included teaching about the environment in their classes. (For the full document listing teachers' responses to this question, see Appendix M, "Teacher Survey Codes and Results.")

- Through the study of natural science or orientation laborale, we plant trees, take care of them, and clean some of the dirty places. (12A) (3.ACT-REF) (3.SCI, 3.LAB, 3.ACT-CLE)
- Orientation about the cleaning of the classroom every day; Value the importance of plants and the care and respect that they deserve; Respect and maintain the gardens and the trees; Reforest and water the plants; Pick up the garbage in their homes and school and put it in its place. (35B) (3.ACT-CLE) (3.ISS-CLE; 3.ACT-REF)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.ACT-CLE) (3.ISS-CLE, 3.HYG; 3.SPE; 3.ACT-REF)

iv) Summary of Programs Currently Underway Offered by Teachers in Formal Education Settings

Some sort of teaching about the environment reportedly has been included in classroom teaching by 95% of the teachers surveyed. Of the total of 83 teachers surveyed, 93% of the teachers provided a description of the manner in which they had included teaching about the environment in their class(es). Three strong themes emerged for ways in which teaching about the environment has been incorporated into Carazo's classrooms. The first theme was teaching about environmental issues, especially environmental preservation/ conservation issues, deforestation, and cleanliness issues. Much of this issue-related teaching is incorporated into the teaching of traditional subjects, especially science and social studies. The second theme was integrating teaching about the environment into other traditional subjects such as science and social studies. Finally, the third theme arose from a smaller but still significant portion of teachers who reported involving their students in some sort of environmental action component such as reforestation projects or clean-up campaigns, both in the school and in the community.

e) Curriculum Guides

i) Description of Curriculum Guides

Several interview subjects mentioned environmental education curriculum guides that had been developed for use in Nicaragua and which could be specifically tailored to Carazo and other departments. Through the survey, 74% of the teachers reported having access to textbooks, a category that included curriculum guides.

- [The Peace Corps volunteers] started using this book that was developed by Peace Corps volunteers and the MED in Guatemala and everything is active education. They use 10 different general topics usable in almost any community. For example, awareness of the environment, animals, trees, garbage, water, soil, protected areas, populations and sustainability, sustainable development and environmental ethics. Everything is with games and dynamics. (VI, 13, 9) (4.CURR) (XX)
- I have a committee in Panama that is also working with Peace Corps in environmental education but they started working in curriculum development with the MED so they created for each grade a manual. This is the second grade—it has all the different courses: Spanish, math, natural science, and each one has objectives, a topic and a dynamic. We started using this with the Nicaragua curriculum and came up with this guide created by a Peace Corps volunteer and the MED in the community. What she did was use this to incorporate

environmental education into the Nicaragua curriculum. Now it says for each course from first to third grade what to do. (VI, 13, 9) (4.CURR) (14.MED)

- Right now [the environmental education direction of MARENA is] trying to carry out or design an environmental education program for Granada [one of the departments] that is specifically for the municipality so that's why I'm very interested in your design—because I'm doing the same effort and we might share documents and efforts. We have two girls and a Canadian consultant doing this program. We are doing it as a pilot project. (I, 5, 2-3) (15.CURR) (XX)

ii) Successes with Curriculum Guides

The curriculum guides put out by MED and local as well as international NGOs correlate with MED's environmental education, primary, and secondary curricula. Additionally, it appears that there are various environmental education curriculum guides available currently, with an influx of materials arriving six months to a year after the NAAEE Training and Environmental Education Materials (TEEM) training, held in June 1998. (This was a training program conducted for Latin American environmental educators and communicators, of which one of the main objectives is to provide more Spanish language environmental education materials to Latin American countries.)

- NAAEE is going to bring book packages for environmental education already translated into Spanish. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (3.CURR) (3.TEXT)
- There are seven chapters in [MAN's environmental education curriculum guide] and it's more or less to give teachers an idea of how to incorporate EE into the classroom. [We] have ideas like examples but [we] leave a lot of it up to the individual teachers as to how they teach it. For example, in Masaya [the teachers] developed more of their EE on water because that's what they're the most worried about and they developed their own songs, social dramas and poems specific to the area of Masaya. They used the book as a guide but then they did their own work. It also helps the teachers not to have such a rote learning system which a lot of the teachers have. They also instruct people on things you can do in the house to help the environment. (IV, 20, 5) (4.CURR) (2.CURR)
- An important thing to mention is that the labeling that is in [the Peace Corps'] environmental guide books is indispensable—this is a book done with MED in Nicaragua. It actually lists all the activities and at what point they apply directly to the curriculum so the teacher can go through her book and mark what areas she has activities for. [Interviewer] Most of the teachers don't have copies of this book, right? [Subject] [None of the] teachers have copies. [Interviewer] This is the one that the Peace Corps is trying to raise money to distribute? [Subject] This is the one that Peace Corps made. There are two of them—first through third and fourth through sixth [grade students]. (VI, 4, 8) (4.CURR) (4.TNG; 6.\$)

iii) Problems with Curriculum Guides

Problems arising with curriculum guides in Carazo do not center around the lack of curriculum materials; rather, they focus on the lack of funding to disseminate these resources. (For more information on resources available and the funding and dissemination issues associated with environmental education resources in Carazo, see section III-C in this chapter.)

- The unit in [MARENA's curriculum guide] isn't really specific, it just kind of says "Be nice to the environment. Don't throw things in the street," and stuff like that. (VI, 4, 5) (3.CURR) (6.EE)
- There are few resources. In written materials [MED has] only those which MARENA gives us or natural science texts, making use of the ecological museum. (II, 16, 2) (4.CURR) (4.MUS, 4.TEXT)
- At the Ministry of Education level, [ecological brigade leaders] get some support as far as literature and illustrations and things of that sort and bibliographies—and there's some of it but [I think] it's not enough and . . . that there's a lot of need to improve that. (I, 11, 4) (4.CURR) (4.BIB)
- I don't think it's very effective to say "We have these Nicaraguan resources," which [the Peace Corps does]—we have a book created with activities for Nicaragua, but we don't have the funds to get them printed. (VI, 4, 7) (4.CURR) (6.\$)
- And at certain localities, like in Chinandega and some other places, some organizations like the Peace Corps, they have elaborated some kind of material that they are using but [I think] that that material should be duplicated and should be sent to other communities so that they can use it so what's being done right now as far as providing those resources is not enough . . . (I, 11, 4) (4.CURR) (XX)

Another problem with curriculum guides already developed or under development is lack of institutional support. As the curriculum in Nicaragua is centralized, all of the changes must come through the main MED office in Managua. Without the support of MED, any changes in curriculum or implementation of new guides is nearly impossible.

- [MED] has supported the idea [of developing an environmental education curriculum guide] but they haven't supported the guidebook. At first [MAN] had problems with the central MED here in Managua. [I believe] that they were a little bit jealous because [MAN was] developing the guidebook. [MAN] started working in the Masaya area and the local offices of MED were giving [us] a lot of support and they were talking to the central offices and telling them that this was a really good guide book and that they really liked it. So, [I'm] hoping that [MED's] central office will like it and that [we'll] get more support. (IV, 20, 2) (4.CURR) (XX)

f) University-Level Programs

None of the data-gathering sources used in this study indicated the existence of any university-level programs specifically focusing on environmental education. While there is a department of natural resources and the environment at the National Agrarian University (UNA), there is not an environmental education course of study or degree offered. Additionally, one university (the UNAN, or National Nicaraguan University) offers a biology teaching degree that touches on environmental issues but does not focus specifically on environmental education.

- [Interviewer] Within Nicaragua, are there any universities that have environmental education as a degree or major? [Subject] No, but you find that in courses like “National Parks and Protected Areas,” we use a lot of techniques from interpretation so in those there is an EE component but not like a course and seeing the different aspects—formal, non-formal, informal education, etc. (VI, 13, 8) (2.UNIV) (8.UNIV)
- [Interviewer] Which university would you say focuses the most on environmental education? If there were someone interested in environmental education, would they major in education and take science classes or would they major in science and take education classes? [Subject] I’ll take something back, the UNAN, the national university which is the public one, they have a bachelor’s degree focusing on biology for teaching so they receive the more formal education and a lot of them are working as teachers. They focus more on education than on regular sciences. (VI, 13, 8) (2.UNIV) (8.UNIV)
- So far, the idea is to improve the college [of natural resources at UNA] and create new majors within this faculty—as of now we’re very limited. We have agronomists with more knowledge about soil management and irrigation and not focusing on environmental problems. So, I think we need to train professional technicians on the faculty relating to environmental problems. At least we want to change this to a school—we have the school of forestry and the school of soil and water. The proposal is that, within three years, we would like to have a department of natural resources management and the other one in environmental protection. With these two departments, I think we will develop more things about the environment. (VIII, 19, 1) (2.UNIV) (XX)
- [UNA wants] to develop and first we want to have a post-graduate program about the Natural Resources Management. So far I cannot tell you exactly what the program we will have but this is the program we want to develop. At the moment, we only have agronomists and agricultural engineers—these are the two areas we have. But training in environmental education, we don’t have. This is a very big area missing in the university in general. (VIII, 19, 1) (2.UNIV) (XX)

2. Teacher Training Programs

Teacher training programs in Carazo include pre-service and in-service training. Pre-service training is provided through the normal or teacher training school, while in-service training is supported by MED and takes place during the week preceding the start of school each

year. Teacher training programs were explored through the personal interviews and also through the teacher survey questions.

a) Teacher Survey Responses Regarding Teacher Training

i. Past Teacher Training in Environmental Education

In the teacher surveys, the subjects were asked whether they had received training in environmental education, according to their personal definition of environmental education. Thirty-five percent of the teachers said that they had received training specifically in environmental education. However, when asked about what they thought were the greatest barriers to teaching about the environment, 51% of the teachers marked, "Lack of training in environmental education."

Another component of the teacher survey explored whether the teachers had received in-service training (52% of the teachers answered "yes") and in which subjects. Only 6% of the teachers said they had received in-service training in environmental topics. These topics included a course in community environmental problems and a course in environmental education (linked with a biology degree-seeking program). Related subjects also had low percentages of teachers who had received training in these areas. The related subjects included: science (8.5%), social studies (2%), and geography (2%).

ii. Providers of Teacher Training

As for the current providers of training in general, the organizations mentioned by the teachers were: MED (6%), universities (4%), UNICEF (2%), UNESCO (2%), and mayors' offices (2%). Although the survey asked the teachers to specify which organization provided the in-service training they received, most survey respondents did not answer this question completely. Additionally, 51% of the teachers reported attending the normal school, which makes these institutions, by far, the largest providers of teacher training.

iii. Discrepancies in Environmental Education Training Descriptions Provided by Teachers

Discrepancies are evident in the teacher training data gathered through the surveys. While 35% of the teachers said they had received training specifically in environmental education, only 6% mentioned receiving in-service training in environmental education or related subjects. Also 51% of the teachers indicated that more training in environmental

education would encourage them to include more teaching about the environment in their classes. These discrepancies could indicate several issues. First, many teachers may have answered that they had received training in environmental education because they were aware that this survey was a survey being administered by MARENA with cooperation from MED. This may have influenced the teachers to believe that they *should* indicate that they had received environmental education training. Another possibility is that many of the teachers may have received environmental education training as pre-service training at the normal schools as many of the normal schools are starting to promote more of a focus on environmental topics.

b) Interview Responses Regarding Teacher Training Programs

Several interview subjects mentioned teacher training programs when asked about environmental education programs currently underway in Carazo. These teacher training programs were offered either by the interview subject's organization or by other organizations with which the subject was familiar.

i. Environmental Education Teacher Training Provided by Organizations and Agencies

Organizations that reported providing teacher training had approached the subject gradually, building trust between the teachers and the outside trainer. Ideally, the teachers would end up passing on their knowledge of and excitement about environmental education to other teachers, rather than always requiring an outsider, either foreign or Nicaraguan, from an NGO to design and implement the environmental education in-service training programs.

- [MAN has] had eight [environmental education training] workshops and [we] know that isn't very many but [we] had some basic goals before [we] went into the workshops. [We] wanted to have them in areas where MAN was already present and also [we] wanted to make sure that the professors and school district had interest in the project. [I] wanted to make sure that all the professors were volunteers because . . . they don't get paid very much so [I] didn't want to make it requisite that they participate in those things so that they're all volunteers. [I want] to make sure that they have a lot of interest and that they like it. (IV, 20, 3) (2.TTNG) (9.WRK; 7.TEACH)
- Last year, [I] was working mainly in the schools—[I] worked in the normal school, which is the teacher training school, and [CECOTROPIC works] there because the teachers are going to be trained and they want them to . . . the multiplier effect. [We] worked with tree nurseries, [we] worked in deforestation, [we] worked a little bit in natural fertilizers and some in gardening. [I] worked with them in about six months and it was mainly done in the form of talks with teachers, and this is another thing that CECOTROPIC is doing. (V, 23, 7) (2.TTNG) (XX)

- The way we are approaching it is to explain to the teachers that [Peace Corps] volunteers are here to support them— not to give more work but to help them by doing a more active class, by giving them a more active class is less work for them and in the long term students have a better long term understanding and better results, even in grades, because they remember longer. Because teachers feel that you have to prepare a lot to do these things with your class, the volunteer has to explain it's just thinking about what to do and using local materials like the same pens and papers they have and more imagination. Also, we work with the teachers that want to work with the volunteers. The ones that are not that enthusiastic, we just leave them alone and we'll come back to them later. This is also adult education, teaching to the teachers, and we know that we don't learn just by receiving information—we have to do it. After seven months of watching the volunteers and seeing the results, the teachers realize that the students remember more what the volunteer is teaching and doing than what the teacher is doing so that's when we've convinced them— just by seeing it in the classroom. (VI, 13, 12) (2.TTNG) (8.TEACH; 9.DEM)
- After seven months, when the teacher is aware that the dynamics are good—when they realize that the students remember better what they do rather than what they memorize and that they are using their creativity and local knowledge—they agree to start working with the [Peace Corps] volunteer in a planning process using the Nicaraguan curriculum, how to incorporate dynamics in those topics. The second year of the volunteer service, the teacher will do the dynamics—at least once every week and the volunteers will support the teachers and help them. Teachers will lose or gain confidence in using dynamics in some activities and other classroom activities—using their curriculum because they don't want to spend time using other topics that are not covered by the curriculum. (VI, 13, 4) (2.TTNG) (8.TEACH)
- Then [the teachers and the Peace Corps volunteer are] going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade—so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas. (VI, 12, 3) (2.TTNG) (9.WRK; 8.TEACH)

Some of the teacher training programs currently underway try to make use of the time set aside at the beginning of the year for in-service training, in addition to time spent in the classrooms during the school year.

- [MED has] a time every year where the teachers participate in workshops and talks. Sometimes the NGOs give talks or the MED or other ministries. (II, 16, 2) (2.TTNG) (XX)
- So what the teachers do right now, the [Peace Corps] volunteer explains to the teachers using paper on the wall summarizing the dynamic, they do it and they write it down with notes— what grades, how to do it, etc. We start doing that with two hours using MED training at the beginning of each year in February, for example. (VI, 13, 10) (2.TTNG) (9.INS; 8.TEACH)
- So, [the local schools] have the structure in formal education to have a good environmental education project, with the set aside time at the beginning of each year, I believe they also have it at the beginning of each semester for teacher training. (VI, 3, 4) (2.TTNG) (XX)

ii. Problems with Environmental Education Teacher Training Provided by Organizations and Agencies

Problems arose with the use of time in the in-service training workshops, as well as funding for these in-service environmental education workshops. Also, the lack of incentives for teachers to participate in training programs and to incorporate environmental education into their classes poses problems to programs currently underway.

- So, before each school year and what I've heard that [the schools have] done is a lot of . . . they don't have anything really well planned. [The teachers] just kind of meet . . . they get together and they talk. And those two weeks could really be taken advantage of by using them to give maybe a two day workshop on how to incorporate environmental topics in the different classroom issues and how to use their guidebook that they do have by MED and the environmental issues they're supposed to cover. (VI, 3, 4) (2.TTNG) (XX)
- I'll tell you what the teachers really like. They really like the teacher in-service trainings where an outside organization gives them and pays for it. They got into a big fight with MED because when they had the one in July, they said they were supposed to get more money to cover transportation and food . . . (VI, 4, 7) (2.TTNG) (9.INS; 11.TNG)
- [Interviewer] So the teachers get money from MED to cover [transportation and food]? [Subject] Yes, and [the teachers] were up in arms about it because it wasn't variable. They were coming from all different areas but they all got paid the same and most of them ended up trying to race home for an hour to eat lunch because they didn't want to pay to eat a meal there. That seems to be more effective if an in-service training like that were kind of like you'd present the materials to them and say "This is how you do it" and it won't be 100% effective—that's kind of one of the frustrations of working here. (VI, 4, 8) (2.TTNG) (6.\$)

Many of the interview subjects mentioned a lack of educator training to be a problem with various environmental programs that were underway.

- Like [the teachers are] supposed to show the kids how to make a tree nursery, how to collect seeds and a lot of them don't because a lot of these things, they don't know how to do so they just have this book and they just pass over that or they check it off and say, "We've done it" and they've really done a half-[expletive] job, they just kind of halfway did it or they had each kid plant a watermelon seed and that was their forest project or whatever. (VI, 3, 4) (6.TNG) (XX)
- The problem is that the teachers don't know what environmental work is. The principals don't—they think it's painting the stadium or making a place look pretty. They don't understand that it's something to better the environment, that it doesn't necessarily mean that you have to pick up trash, that you could do a community education project and you can get the kids involved in it. (VI, 3, 4) (6.TNG) (XX)

- I think a big problem in education is ineffective teaching methods (including “by example”—it’s frustrating when the teachers throw trash in the street after school clean-ups). A teacher I worked with in La Paz was copying lengthy paragraphs out of the book and said “Okay kids, let’s copy this.” It just didn’t have any effect on the kids. Instead, he could give [talks], taking the trash, burying it, and digging it up two months later. [The teachers] don’t think about it. (VI, 4, 5) (6.TNG) (10.TNG)

Lack of training in the use of active methodologies and in environmental education topics was frequently mentioned as a barrier to environmental education in Carazo.

- From the year 1983 [MED] started incorporating environmental education in the curriculum from the Ministry of Education and even people from FUNCOD like Carmin Olatta was working with them but one of the weaknesses that was striking in those days was, like right now, that there was not a proper training for the teachers so that they could implement the . . . whatever they have incorporated in the environmental education program and [I] still [feel] like there’s a need to do that. And from the year 1988 up to now it looks like people are becoming more aware of the need and it looks like some efforts are being done on that subject. But again [I feel], and [I emphasize] the fact that more training should be done in order to capacitate the teachers so that they can pass on the knowledge they acquire to the students. (I, 11, 3) (10.TNG) (XX)
- I think the way that people teach here—I know that there is a school called the “Normale” where all the teachers go and then they do a one or two year internship in different parts of Nicaragua. However, the training doesn’t seem to help because many teachers just talk *at* the kids and the students don’t pay attention. There’s not enough hands on activities or labs. I don’t think you need a lot of resources to think of a lab or experiment. You may need a few materials but it’s not very expensive and you can find things within the community to do activities. I don’t think money is the big problem—I think it’s just ideas and the way their teaching is here. Some teachers are great, however it seems that the majority of teachers use traditional teaching methods, and the kids don’t learn to think for themselves or learn to solve problems or even analyze what the problem is. (VI, 12, 4) (10.TNG) (XX)

c) Summary of Teacher Training Programs

Through teacher surveys and personal interviews, it was determined that improved and increased teacher training is a critical need in Carazo. Teachers identified more training in environmental education as the most important factor that would increase their level of teaching about the environment in the classroom. (This factor was chosen by 72% of the teachers surveyed.) Interestingly, when the teachers were asked what barriers most kept them from teaching about the environment in their classes, they selected “lack of environmental education training” (51%) second behind “lack of environmental education resources” (58%). When looking at the answers to these two questions, it is obvious that more environmental education

training for teachers would undoubtedly have a significant impact on the level of environmental education in the formal sector.

The personal interview subjects also mentioned the importance of teacher training programs in increasing teachers' confidence in teaching environmental education and teachers' knowledge about environmental issues. Interview subjects expressed concern over the current design of in-service teacher training programs and felt that the time and funding spent on these programs could be more effectively used if the training workshops were designed to include training on more active environmental education projects. The interview subjects also stressed the fact that the teachers would not teach about subjects with which they were not comfortable, and that more teacher training could be the key to making teachers more comfortable with the topic of the environment.

3. Environmental Campaigns and Parades

a) Description of Environmental Campaigns and Parades

Many environmental education programs currently underway in Carazo focus on campaigns and parades as methods of spreading information regarding environmental issues. These efforts are usually one day events, although some of the campaigns in Carazo last several days, depending on the topic, the time of year, the program's funding, and the number of participants. Some campaigns are organized through schools or through ecological brigades while others are community events. Funding and support for the campaigns comes from diverse sources including MARENA, MED, and MINSA.

- [The ecological brigade members are] working on what's called the Plan Playa, which is the type of project that takes place during the summer vacations and the brigades go to the different beach resorts around the area, around here on the coast, and they try to train the tourists to help manage the waste—not to throw it on the beaches. The activities that they develop—picking up the waste and all that. They also give talks to the different people that are there—telling them about the negative effects of throwing the waste on beaches. (VII, 10, 2) (2.CAM) (2.TRAS)
- For example, during Easter week, young people [in the ecological brigades] work on the heavily visited beach areas educating vacationers and residents to keep the waters and beach itself clear of garbage. (I, 8, 1) (2.CAM) (2.TRAS)

b) Successes of Environmental Campaigns and Parades

Environmental campaigns and parades are successful in the sense that they build on the fun-loving Nicaraguan culture and fit in well with many of the religious or political festivals that take place in the country throughout the year. Additionally, students are more easily organized around a single, exciting, culminating event as there is a goal established and certain concrete actions are taken to achieve that goal. Community members are supportive of campaigns and environmental parades because they provide a visual, festive forum for spreading information about environmental issues to diverse segments of the community.

- Just the fact that [the ecological brigade members] go out on parades with bands and display signs with things that citizens should do like the importance of managing solid waste properly and not to pollute the streets, don't throw things on the streets, the importance of environmental education—that has the effect of making some people conscious of the problem. (VII, 10, 3) (2.PAR) (XX)
- [Parades and campaigns are] very popular because they usually include big posters, big noise, T-shirts, stickers, fun stuff, a party kind of situation going on And then it's over with like, it's a lot of energy and a lot of fun and it really fits into the culture here as far as getting people's attention. (VI, 3, 7) (2.CAM) (XX)
- And the fact that they do that, [I have] a lot of requests from most of the students to participate in the brigade and to work with it because they organize tours of the beaches, Plan Playa thing and [we] go some other places on tours related to biodiversity and forests and parks and since [I do] all kinds of activities, a lot of students try to get involved with the brigade to work with [me], participate in all those activities. (VII, 10, 3) (2.CAM) (XX)

c) Problems with Environmental Campaigns and Parades

Some of the successes of environmental campaigns and parades can also be seen as drawbacks of the events. They are usually one day events that do not have a lasting effect. The lack of follow-through on this kind of one-shot project is evident in the lack of connection to everyday life of the messages espoused through environmental campaigns and parades. The ease with which people rally around an exciting, social event can sometimes trivialize critical environmental messages that are meant to be the focus of the events. Additionally, environmental campaigns and parades can be expensive, especially if the campaigns are designed for a national-level audience. The campaigns and parades usually include posters, T-shirts, publicity, prizes, and so on, which means that a reliable source of funding must be secured to support these events.

- [Environmental educators and community members] want a big parade, a big campaign, they want a one-time blurb, and that's what they also see as environmental education. You know, Plan Playa is that clean-up, the Easter weekend clean-up. And it goes great, people yell at each other for throwing their garbage on the ground at the beach, and they say, "See, haven't you listened to the kids?" It's this big campaign, but it's only a week and then everybody goes back home and throws it in their backyard or on the streets. And for a short time it's a success. (VI, 3, 7) (2.PAR) (XX)
- But [MED's departmental environmental education director] wants like these big campaigns so everybody sees so everybody says, "MED is doing something." Everybody's interested in getting all this credit and that's why everybody likes campaigns because they're these big, wonderful things that are flashy and bring in all this attention, bring in all this press attention, get your picture in the paper, like "I'm doing something" and nothing gets done. That's why I don't see any of these organizations as really being effective. (VI, 3, 8) (2.CAM) (XX)
- [MARENA is] trying to design a campaign. Three things we're working on: a strategy, the pilot program and a campaign that we are trying to design for the next four months but we don't have enough money so I don't know if we'll be able to do the campaign that we're trying to do. (I, 5, 3) (2.CAM) (2.NATL; 6.\$)
- EE in the line of increasing awareness because here in Nicaragua we haven't done big campaigns to sensitize the population so all the time the money that the government or MARENA has is not enough—EE is not as important as it should be in the eyes of the people who are at the head of the ministry. (I, 5, 3) (2.CAM) (1.SENS)
- Schools, different organizations and political groups have a kind of systematic EE. It comes and goes—it's a one time thing—they have a big campaign. It's kind of like the festivals of the patron saint. They come once a year and go past but there's no education that continues. (III, 17, 1) (6.FOL) (2.CAM)

d) Summary of Environmental Campaigns and Parades

In summary, environmental campaigns and parades are popular as they are well-received by the Nicaraguan public as well as teachers and students. The events fit in well with the Nicaraguan culture and are a fun, exciting way to spread information about environmental messages. Problems arise, however, in the lack of true community and student involvement in the environmental messages of this type of event. There is usually no follow-through and personal connections to the environmental issues being targeted in the campaigns and parades are not made clear. Additionally, although these programs may be one of the most effective ways to reach diverse sectors of the population, they are often difficult to fund as they can be expensive, one-shot efforts.

4. Government Sponsored Programs and Initiatives

Nicaragua's national level environmental education movement has developed programs and initiatives that have national as well as local level impacts. These programs include national level strategic plan development, national level conferences, and the mandate that every department must form an environmental education commission.

a) Description of National Environmental Education Meetings

The first national level environmental education meetings were held in 1996 and 1997. These were mentioned by interview subjects and the proceedings from the conferences were included as part of the documentary source review. The national meetings gathered people from around the country to create a common basis for environmental education interests and programs as well as to develop a cohesive environmental education strategy to be followed throughout the country.

- MARENA is the one that is promoting the organization of these commissions. In [December 1996], we had a conference at the national level (December 11 to 13) on EE. From there we made several suggestions on things that could be done on EE. We're trying to establish a network on the national level to exchange experiences; to establish whatever actions we think are necessary to attack the problem, and to use our human resources in the best ways. (II, 1, 4) (2.CONF) (XX)
- We had the great opportunity to put together 250 people and had the opportunity to make the departments or local committees and for almost the first time, it was an opportunity to talk about the conceptualization of EE, to the methodologies that the people are taking—political lines and strategic lines. (I, 5, 6) (2.CONF) (XX)
- So, we had two topics we focused on at the second meeting [held in November 1997]. The strategy—their suggestions around the document—and the second topic was the planning, the action. The people decide what are the objectives for the third meeting—and they designed that, where the third meeting will happen, and the mechanism to communicate all the comments on the thing. In the proceedings you will find the objectives for the third meeting. [Interviewer] And that will be taking place in July [1998]? [Subject] In July—the third meeting, in Granada, near Carazo. (I, 6, 4) (2.CONF) (XX)

b) Description of National Strategic Plan for Environmental Education

From the national meetings, it was determined that development of a national strategic plan for environmental education was a critical element of strengthening environmental education in Nicaragua. The development of a national environmental education strategic plan was pursued from 1996 through 1998. In January 1998, a draft version of the strategic plan was

circulated to key environmental education leaders in the country for comment. The 1998 national environmental education meeting intended to focus on reevaluating this proposed, draft strategic plan.

- Three things [MARENA is] working on: a strategy, the pilot program, and a campaign that we are trying to design for the next four months but we don't have enough money so I don't know if we'll be able to do the campaign that we're trying to do. (I, 5, 3) (2.NATL) (2.CAM; 6.\$)
- [Interviewer] This [national environmental education] strategic plan you mentioned [that MARENA is developing], is that for all of Nicaragua? [Subject] Yes, it is a reference. It is a framework for the nation, for everybody, but it is just a reference because we think that each department should make their own EE strategy based on their own problems using this reference or framework. (I, 5, 3) (2.NATL) (XX)
- . . . so far we are not happy with the [strategic planning] document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. [Interviewer] And the parts of the strategic plan, they're addressing which areas of environmental education? [Subject] Formal education, non-formal education, and informal education—to teach the strategy that tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (2.NATL) (8.K; 8.12; 8.COMM; 8.UNIV; 8.MD)
- [MED is] going to work on a central, national strategy—there's not going to be a regional thing. It's going to be flexible, so you could adapt it to local conditions, to get at the local people as far as local needs are concerned, local resources are concerned to get this environmental education as an in-service training according to the circumstances and conditions of each community, of each locality and getting people that are interested and love environmental education, getting them involved in the environmental education strategies that are going to be implemented on the local levels, using of course the central design as a guideline but not as a rigid framework but in a flexible way. (I, 11, 3) (15.NATL) (9.INS)

c) Description of Departmental Environmental Education Commission

From the national environmental education meetings, the second strategy that was laid out as being very important, in addition to the development of a national environmental education strategic plan, was to create departmental level environmental education commissions. Carazo successfully identified and gathered a group of departmental environmental education leaders to be members of this environmental education commission. An important function of this commission is to promote coordination, cooperation, and communication between the groups and programs focusing on environmental education in Carazo.

- We are organizing EE commissions at the state level—already have one, forming one at city level who then is forming one at a rural level (the idea is to have a whole net of EE commissions at rural, county, and state levels); [We are] in the process of organizing them—almost all of them are organized; all eight counties [in Carazo] already have EE commissions at the county level. We're asking many people to be involved at an organizational level and then volunteer on a personal level. The Ministry of Education and local NGOs are also involved. Last Friday, there was a commission meeting for one county, 60 people attended, local NGOs, governmental representatives. (II, 1, 3) (2.CMS) (XX)
- This [departmental] commission with the proper mechanisms will prevent [overlap between programs and lack of communication] from happening. Whoever comes into the [department] and wants to do something having to do with the environment, they must go through the [departmental] commission so that the commission knows what they are going to do and not duplicate the efforts. (II, 1, 10) (2.CMS) (XX)
- The [departmental] commission is sort of coordinated by MARENA, but not only MARENA. Two other people are working with us—one person from UNA and one representative from CECOTROPIC, which is another NGO. He's the secretary of the commission, he's a newspaper man, he's the one who is doing the publicity and extends the invitations, since he has access to the media and communication—Humberto Campos. (II, 1, 10) (2.CMS) (XX)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but [we] do have about seven coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (2.CMS) (14.MAR; 14.CEC; 14.FUN; 14.POS; 5.GER)

At the national environmental education conferences, the delegates from each department met to lay out strategies to present to the rest of the conference participants regarding what actions would be undertaken in their department over the next year. The first year (1996), 13 delegates from Carazo attended the meeting. Organizations and agencies represented included MARENA-Carazo; the mayor's offices of Santa Teresa, San Marcos, and Jinotepe; UNA; CECOTROPIC; and others. The strategies developed by Carazo's delegates were:

STRENGTHEN:

- Follow the example of the commission of Santa Teresa in developing a departmental environmental education strategy.
- Continue with organization of the departmental environmental education commission (organized by Peace Corps and MARENA-Carazo).

PURPOSE OF THE NETWORK:

- Continue carrying out the acts of the commission.
- Promote inter-institutional coordination.
- Work systematically on joint plans to deal with problems.

ACTIONS:

- Develop a strategic plan (supported by the Mayor's office[s]).
- Departmental diagnosis.
- Spread to more institutions.
- Form municipal networks.

SUGGESTIONS:

- Work with the authorities.
- Coordinate with the national network.
- Communicate smoothly with [other national and departmental organizations involved with environmental education].

(CENEA and MARENA, 1996)

The second national meeting was held in 1997. In attendance at this meeting were only four delegates from Carazo so they worked in conjunction with representatives from other departments located in the same geographic area (Chinandega, Managua, Raas, and Leon) to determine strategies for the coming year. These strategies are listed in Table 4-12.

Table 4-12: Objectives, Goals, and Activities for Environmental Education in Carazo as Determined at the 1997 National Environmental Education Meeting

Objectives	Goals and Dates	Activities	Responsible Parties
Adapt the strategic environmental education plan to the local realities.	Two meetings, between Jan. 5 and 30, 1998	Meetings to discuss the conceptual environmental education documents.	Environmental educators
Strengthen the municipal environmental education commissions.	One meeting, between Feb. 1 and 10, 1998	Present the rough draft of the national environmental action strategy to the municipal council.	Municipal environmental education delegation, network coordinator
Shape/adapt the environmental education network to a departmental and municipal level.	Municipal and departmental forums, between Feb. 15 and 28, 1998	Restructure the municipal and departmental networks.	Municipal environmental education commissions, network coordinator
Facilitate the diffusion, documentation, and interchange of experiences.	Environmental education information banks, April 1998	Create local information banks.	Municipal environmental education commission, network coordinator

Carazo's delegates to the two national environmental education meetings developed far-reaching, positive objectives and plans. Unfortunately, as the department had not yet created a firm and binding environmental education strategy, most of these plans were not implemented as hoped. A third national environmental education meeting took place during the summer of 1998. (The proceedings and outcomes from the third national environmental education meeting were not yet available at the time of the completion of this study.)

d) Summary of Government Sponsored Programs and Initiatives

Government sponsored environmental education programs that were mentioned in the personal interviews and documents reviewed focused on the national environmental education meetings, the national environmental education strategy, and the creation of the departmental environmental education commissions. All of these programs were seen as having a local effect on environmental education in Carazo. They also demonstrate governmental-level support for and interest in environmental education programs.

5. Technical Assistance Programs

a) Description and Successes of Technical Assistance Programs

Many programs cited by interview subjects and in the documentary sources as being environmental education provided technical assistance to farmers, natural resource users, and community members. Although not traditionally thought of as environmental education programs in northern, developed countries, the reality in countries such as Nicaragua is that technical assistance programs provide much needed education to the individuals whose actions are often at the core of the environmental problems being faced by the country.

- To say which organizations are doing environmental education, it really depends on your definition of EE. Many organizations are doing what [North Americans] would call extension kind of work such as working with campesinos on soil conservation, tree planting, farming techniques, organic agriculture. (VI, 2, 8) (2.TEC) (XX)
- Usual activities [of MARENA technicians] include giving permission to cut down trees for commercial, domestic, energy uses. There is now a new law now that says that in order to get permission to cut trees, a management plan must be presented to plant trees in areas affected by cutting and [the person or organization cutting the trees] must establish management activities to promote natural re-growth of trees. (II, 1, 2) (2.TEC) (XX)
- POSAF finances organizations to work with groups of producers within the following areas: Agroforestry, in which we only finance organic farming—nothing with chemicals. In silvopastoral, we give financing to better pasture land but not to buy more cattle. POSAF provides a 30 to 60 percent incentive to the producer, depending on their case. (II, 7, 1) (2.TEC) (5.POSAF)
- [Peace Corps] also [works] in non-formal education through the agricultural producers. That component of our program is a lot smaller than EE—the only reason for that is that it is very difficult to find organized groups of farmers where we can target and work very efficiently with them so at the beginning of this program (two years old) we started with half of the volunteers working in formal and half in non-formal. (VI, 13, 5) (2.TEC) (8.AG; 6.COORD)

One of the successful technical assistance programs in Managua and in Carazo uses a strategy that could be an effective one for more direct types of environmental education, in conjunction with technical assistance and agricultural education. CECOTROPIC sponsors a weekly radio show out of Managua that focuses on agricultural issues, with an environmental slant.

- [The radio show] is an agricultural show so [we] do a lot of what is conservation of soil and water and natural fertilizers—things that are going to help the producers. Agroforestry—[we] get some information on economics on how much things cost—to help the producers

know these facts before they go to the markets so that they're not losing money or being lied to. [We] also do environmental education, which is really amplified—[we] invite organizations that are working in environmental projects to talk about their projects or [we] invite MARENA to talk about what they're doing. [We] talk about fisheries . . . all kinds of topics are covered as well as environmental education. It's more of a motivator and informer than used for training. (V, 23, 10) (2.RAD) (XX)

- It's mostly for producers but [I've] personally been trying to put more of environmental education issues into the program so they try to focus at least 10 to 15 minutes weekly on environmental issues, which are also picked up by the TV stations and general population. (V, 23, 10) (2.RAD) (XX)

b) Problems with Technical Assistance Programs

Technical assistance programs are often funded and supported by NGOs and lack local support. This was also mentioned as a problem with environmental education programs in the schools as both types of programs depend heavily on national and international NGOs for staffing and funding.

- Unfortunately, I see mostly either volunteers or cooperantes, which are from other countries, being effective, like in technical assistance, mainly because they're getting, they have their job as mainly [working on a specific environmental problem]. (VI, 3, 6) (2.TEC) (XX)

c) Summary of Technical Assistance Programs

Technical assistance programs are widespread in Carazo. Although these technical assistance programs might not be what are traditionally thought of as environmental education, they provide important environmental information through non-formal channels to audiences other than teachers and students.

6. Issue-Focused Technical Assistance Programs

Following on the heels of traditional technical assistance programs are those that focus on specific topics such as solid waste management, deforestation/reforestation, and alternative energy strategies.

a) Deforestation Issues Addressed through Technical Assistance Programs

i. Reforestation Projects

In reforestation projects (which address the critical environmental issue of deforestation), many technical assistance programs are promoting tree nurseries both on the school and community levels.

- [Peace Corps is] basically promoting school nurseries using fruit trees and fuel trees and we are promoting a lot of fruit trees, trying to show the students that, if they would like to have fruits, they can grow them. They bring the seeds from their houses like mangoes or whatever is available and they have one or two plants and they use local resources and there are milk bags we use instead of buying plastic bags. In other places, we just have the nurseries without having bags so they will learn how to have the trees and how to grow them. (VI, 13, 4) (2.TREE) (8.K)
- POSAF-Carazo focuses on the management and recovery of natural resources, which includes projects in agroforestry, silvopastoral, and reforestation. At this moment, POSAF is working in cooperation with the different mayors' offices in reforestation projects. (II, 7, 1) (2.REF) (XX)
- And also [the ecological brigade has] some kind of projects on planting trees in different areas of the city, around the school, like some type of landscape work and establish some gardens in several places like the entrance to Diriamba and the exit of Diriamba to the south and they try to plant trees on the road and various places so they're doing like an urban type of reforestation. (VII, 10, 2) (2.REF) (XX)
- Some of the seniors who are just getting ready to graduate from high school, they have put a fence around the trees around the area and they have planted about 2,000 trees. (VII, 10, 2) (2.REF) (2.TREE; 2.SCH; 6.SCH)
- FUNCOD has campaigns in schools such as seminars, presentations, as well as being a pioneer in the organization of ecology clubs since the 1980s, whose goals are to better the environment through reforestation. Example: the campaign to plant the national tree, which is on its way to extinction, and through this a project has been developed called "Protection and Conservation of National Species," of which 12 [native tree species] are affected. (IV, 15, 2) (2.REF) (2.BRI, 2.K12)

ii. Alternative Energy Issues Addressed through Solar Oven Projects

A consequence of deforestation that surfaced in programs offered in Carazo was teaching about alternative energy sources. The use of solar ovens was promoted by a Peace Corps volunteer and a Finnish development agency employee who worked in Carazo for more than three years each.

- We started with Peace Corps (with Vonda) and the Finland development organization promoting the use of the cocina solar (solar oven) which is a type of kitchen that uses firewood more efficiently; had a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives; at that seminar, we actually built those cocinas and solar ovens. (II, 1, 7) (2.SOL) (XX)
- I started this solar ovens project—kind of as a secondary project—something to keep me busy and people had an interest in learning about it. (VI, 3, 2) (2.SOL) (XX)
- Yes, the first year I worked with the guy from Finland on [the solar oven project] and we contacted a few people, like a few communities Like we had a few demonstrations for the press and they took pictures for the newspaper and stuff and a few people that were at these demonstrations with the press said that their neighborhoods would be interested so we went and gave free demonstrations in the neighborhoods and we took lists of people that would like to go to a workshop. And then we held workshops. And then the second year, we were full with people calling us and asking us to come and give a workshop to a group of people that they had organized. (VI, 3, 3) (2.SOL) (XX)

iii. Problems with Reforestation and Solar Oven Projects

Once again, the problems that surfaced with reforestation, tree nursery programs, and solar oven projects were similar to those mentioned in conjunction with other programs promoted by expatriates or NGOs. The lack of adequate community-level counterparts as well as financial resources were strikingly obvious and mentioned by several interview subjects.

- The mayor's office was to take [the tree nursery] over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone have anyone who had any idea what was going on with the tree nursery. (VI, 3, 1) (2.TREE) (XX)
- You have to start really small and build up—a lot of it is trying to improve upon the existing structures that are here. Like, people drove me crazy because they wanted to have [tree nurseries] in the school and they asked "Okay, who's going to buy the seeds?" and I said, "Nobody's going to buy the seeds, we're going to collect seeds like they used to do in the days of the Indians—we're just going to pull them off of the tree when they have seeds." "Well, who's going to buy this, who's going to buy that, who's going to buy the land?" "Nobody is going to buy the land—we're going to find people who are going to donate it." The best programs are the ones that make people find their own resources and the time. (VI, 4, 11) (2.TREE) (XX)
- Actually, we've never done any study on who has carried through using [the solar ovens]. I suspect the number is pretty low because it is a big change. And when I first started the project, a lot of people asked me, "This project, you know, I think it would be better to put your energies to something that people would use." But I figured that if people are interested in learning about it and it's some kind of knowledge that I know, and they're interested enough to organize themselves, I'll teach it to them and then if they're going to use it

tomorrow or maybe use it three years down the road, at least they'll have the knowledge and they have an alternative. It's going to be their decision what they do, if they're going to want to use it as an alternative to firewood. So, I don't know, it would be interesting to see how many have used the ovens but I don't know of any right now, to be honest. I know of many that have built them and many organizations that have them and are promoting it further but I don't know of any individuals that are using them. (VI, 3, 3) (2.SOL) (XX)

b) Solid Waste Management Addressed through Technical Assistance Programs

i. Description of Solid Waste Management Technical Assistance Programs

Another popular type of issue-focused technical assistance programs centers on the other often-cited critical environmental problem facing Carazo, solid waste management. Solid waste programs include trash clean-up in the communities and schools, recycling programs, and composting programs.

- In the trash charlas [the students] have games between different groups, classifying trash and stuff. We try to put it into practice in the schools. Like in Arlen Siu, for our trash program, we're going to dig two big holes basically, and we're going to deposit organic trash in one and inorganic in the other. (VI, 4, 4) (2.SCH) (2.TRAS; 8.K)
- [I'm] responsible of a certain area of the ecological activities of the school and so [I] had the support of some other teachers in the school and [we] have like a special kind of banner and [we] give an award to the school room that is cleaner so [we] promote the activities to clean the school and once a month [we] give the special banner, the "banner ecologica," so [we] have been promoting that. (VII, 10, 3) (2.SCH) (6.SCH)
- The way it stands right now on the itinerary, the ecological brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash recollection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (2.COMP) (2.BRIG; 2.TRAS; 8.12; 8.COMM; 14.ALC)

ii. Problems with Solid Waste Management Technical Assistance Programs

Problems cited with solid waste programs is that they focus on the symptoms rather than addressing the root causes of the issue. Instead of educating people about the hazards of poor solid waste management (health issues, environmental effects, effects on local wildlife, ground water contamination, and so on), the solid waste management programs often only teach people to pick up trash and put it "away." There is no deeper message provided about the long term

effects of a “throw-away society” or about the related problems that come from solid waste management issues.

- So if [the ecological brigade] did activities, it was just within the school like putting up posters to clean up the school or cleaning up the school themselves or maybe planting some trees, but within the school grounds and within school hours. (VI, 3, 2) (2.SCH) (XX)

In the focus group document, the participants discussed the root causes, effects, and proposed solutions to solid waste management issues. Interestingly, solid waste management issues were seen as effects of *other* problems, rather than problems in and of themselves.

For example, in the problem listed as “lack of environmental education for the general public,” the causes given are poor educational and social habits, the influence of propaganda, lack of understanding of the importance of the environment, the economic and unemployment situation, and internal and external economic interests. The first effect listed following this problem and these causes is “trash dispersion.” Suggested solutions/alternatives include: training of the fathers and heads-of-family; introduction of programs of study at all levels related to ecology, environmental impacts, and so on; providing energy and technological alternatives; creating agroforestry systems; providing economic incentives to improve the environment; strengthening of the civil society; enforcing the environmental law; and so on.

Another root cause of solid waste issues was “lack of hygienic habits,” which came from poor social and familial training. Proposed solutions for this included: increased family education; the formation of community committees; having the mayor’s office assume responsibility for trash collection; and disposing of trash in appropriate places.

7. Environmental Education and Interpretation Programs in Natural Areas in Carazo

Although Carazo is fairly densely populated because of its proximity to Managua, the department still encompasses several natural and wilderness areas that are accessible to its citizens. Additionally, there are several more natural areas that are just outside of Carazo but are still located relatively close to the larger towns of Carazo.

a) Interpretive Programs Offered at Natural Areas

There is an extensive national park system in Nicaragua, which is administered through MARENA. One of the most developed national parks in the country, Volcan Masaya, is located just outside of Carazo. This park offers ranger-led programs that cater to school groups. Visitor

studies are currently being conducted by GreenCOM in conjunction with the University of Idaho to look at ways to improve the interpretive and environmental education services offered at Volcan Masaya National Park.

- At Volcan Masaya, [the park rangers] see schools almost every day. Usual visitation rate per day is about 300 students although some days it is as high as 800. Some trips are pre-planned while others just show up—the cost is a bit higher for schools who show up when they're not on the schedule. [They] have a big schedule so it is rather well planned out which schools are coming on what days. [Everything is] pretty well set in the way they deal with school groups—the kids arrive and sit down for a 15 minute talk from a ranger about volcano ecology and the park. They then receive a guided tour through the visitors center with the ranger explaining a bit about each exhibit—quality varies with the ranger. Some are very good and know a lot about the park. If requested, [the students are] shown a 20 minute slide show about the park—pretty well done. Then [the students] go walk around the crater area or have a guided tour through the lava caves. (VI, 2, 6) (2.PK) (8.K; 8.12)
- Another one of our major components is a visitors' study at Volcan Masaya National Park. [GreenCOM and MARENA are] implementing a visitor services survey in order to define visitor characteristics of Volcan Masaya National Park. [GreenCOM] created a survey which will be administered by a local-hire assistant over the next 9 months. Describing where the visitors are from, length of stay in the park, how many times they have been to the park, what kind of information and interpretation they received, and their satisfaction with the experience. Once the results are back and tabulated, [we're] hoping to use them to improve the quality of visit to Volcan Masaya. Will work to design interpretive programs and services according to the visitor needs. (VI, 2, 5) (2.STU) (8.COM)

The Chacocente National Wildlife Refuge is located along the ocean on the southwestern edge of Carazo. This area encompasses a turtle nesting beach on the Pacific coast. Chacocente also includes an intact tropical dry forest of which there aren't many left on Nicaragua's heavily populated west coast. As the park remains rustic with very few roads leading into it, it is difficult for school groups to visit Chacocente. Because of this, rangers offer programs within the schools to teach the students about their local environment. GreenCOM and MARENA are conducting several studies in the Chacocente area to determine better ways to involve the local communities in developing education programs for Chacocente National Wildlife Refuge.

- However, [the interpretive programs offered at Volcan Masaya are] not typical. For example, in the Chacocente protected area, visits to the protected area are only from local schools because there isn't much capacity for school groups—[there's] no real visitors center or formal school programs at most other parks/protected areas besides Volcan Masaya. (VI, 2, 6) (2.PK) (2.K12; 8.K; 8.12)

- [GreenCOM and MARENA are] also doing social research in the Chacocente region. Chacocente Wildlife Refuge is a protected area located in Carazo. We're working with the local protected area staff to assess behaviors regarding the turtle beaches—why people are taking eggs, what the belief system is behind it, what the attitudes are and then working with park personnel to create an education campaign to specifically address (and possibly change) these behaviors—using personal interviews and a quantitative survey. Educational materials will be evaluated three months after implementation. Research design created by GreenCOM with involvement by local people and protected area personnel but research itself being conducted by an independent local contractor. (VI, 2, 5) (2.STU) (8.COM)

b) Interpretive Training in Natural Areas

Several organizations are working on providing environmental education training to interpreters in national parks and other natural areas in Carazo and around the country. The supporters of these programs include MARENA, GreenCOM, and Peace Corps volunteers working in certain areas of Nicaragua.

- Each protected area [GreenCOM works] with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period in which they put these ideas into practice, for example, for the next *ten weeks* they are writing interpretive plans for each protected area and identifying *one* project in the plan to produce. The same participants, in teams, come back for a second week-long workshop to learn about design techniques and to create a mock-up of the materials they want to produce. (VI, 2, 2) (2.TNG) (XX)
- [I] took part in a special training that was given to 500 people who were going to act as tour guides at Volcan Masaya National Park. (VII, 10, 1) (2.TNG) (XX)

8. Health Education Programs Linked to Environmental Issues

Although representative of only a few programs uncovered through this study, the avenue of combining health education and environmental education in a country such as Nicaragua is a crucial one. The Ministry of Health (MINSa) provides various health education programs that teach Carazo's citizens about environmentally-related health problems including pesticide poisoning, solid waste management, and water contamination.

- In the past it was thought that MINSa was not responsible for this kind of education but now that [we] have been seeing that both types—as in education about public health and education about the environment—have a connection on the health of the people nearby. It was thought before to be the problem of MARENA but the vision has changed now and with

this acknowledgment of the connection [we] are able to see that such things as contaminated rivers and garbage problems are the leading factors to [Carazo's citizens] health problems. (II, 22, 1) (2.HEA) (14.MINSA; 14.MARENA)

- With health education, in every area SILAS [the pesticide education program of MINSA] works within the communities—with talks within the communities—with speaker systems [we] have on the top of trucks, posters, announcements—in some communities it's more effective than in others. That's mainly because in some communities there's more emphasis or more health problems so they emphasize more in some communities than in other communities. (II, 22, 1) (2.HEA) (2.CAM; 14.MINSA)
- Environmental factors permit that mosquitoes can reproduce in higher quantities so these diseases are spread through environmental problems. One of [our] programs is a community clean-up program where [we] try to emphasize in different departments, in different places that the people keep clean their houses, their yards, their community area to not have this problem with malaria and dengue. (II, 22, 2) (2.HEA) (XX)
- The second problem that [we're] working on is a hygienic problem—keeping the community schools' food and everything adequately clean. This incorporates garbage problems, sources of contamination, problems with “agua negras” [sewage waters], places where mosquito larvae would grow. Then [we] have the malaria project which focuses on risk areas, giving adequate information on how to prevent the excess growth of mosquitoes. (II, 22, 2) (2.HEA) (XX)

Future partnerships between MINSA and MARENA could provide a significant increase in reach and funding for their respective, closely-linked programs. Additionally, there are numerous NGOs who work in what could be considered environmental education through the health education sector, such as UNICEF, Project HOPE, Save the Children, and others.

C. Successes of and Problems with Environmental Education Programs Currently Underway

The results in this section are presented in the following manner:

1. Successes of Environmental Education Programs Currently Underway in Carazo
 - a) Involvement of Students and Teachers in Programs
 - b) Involvement of Local Community Members in Programs
 - c) Involvement of Government Personnel in Programs
 - d) Summary of Successes of Programs Currently Underway in Carazo
2. Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Lack of Knowledge, Time, and Interest of Program Leaders
 - b) Lack of Sustainability of Foreign or NGO-supported Programs
 - c) Lack of Funding and Resources for Environmental Education Programs
 - d) Lack of Planning and Coordination Among Organizations and Agencies Involved in Environmental Education
 - e) Lack of Government Commitment to Environmental Education

- f) Lack of “Real Life” Relevancy in Environmental Education Programs
- g) Lack of Follow-through and Evaluation of Environmental Education Programs
- h) Summary of Problems with Environmental Education Programs Currently Underway in Carazo

Through personal interviews, factors were identified that were considered to represent successes of and problems with environmental education programs currently underway in Carazo. (Information gathered through the teacher surveys did not directly address this issue as the survey instrument focused solely on whether or not teachers were including education about the environment in their classes and not how successful they perceived the inclusion of the topic to be. Information gathered through the documentary sources was not found to adequately address this issue as specific programs and their successes and problems were not discussed in the sources reviewed. Additionally, the focus group did not directly address the issue of the successes of or problems with environmental education programs currently underway in Carazo; rather, the focus group looked at specific environmental problems in the department and proposed solutions to the identified problems.)

1. Successes of Programs Currently Underway in Carazo

Throughout the personal interviews, certain characteristics of successful environmental programs emerged. These characteristics will be discussed in groupings of topics rather than specific programs, although several of them were also highlighted under the program section of this chapter, 4-2-B.

a) Involvement of Students and Teachers in Environmental Education Programs

Successful involvement of students and teachers in environmental education programs included self-selection to participate in programs as well as taking advantage of self-directed learning situations. For teachers, it included a willingness to work with representatives from outside organizations or agencies to increase the level of environmental education taught within their classroom or school.

- As it turned out, I worked with some kids on the [tree nursery/ADECA] project. They were really into it—volunteers They were in high school—volunteers between the ages of 13 and 23. They worked on it, on the tree nursery, helping me out until the trees got to be about a month old. (VI, 3, 2) (7.STU) (XX)

- I work with two rural schools. They're barrios or small communities right outside of Jinotepe. I work with fourth through sixth grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. The people whom I work with are very active and interested in their community. (VI, 12, 2) (7.LOC) (2.K12; 8.K; 8.TEACH)
- We made a mark for ourselves with the [ecological museum] exhibit that allows the students to get to know the objectives of the museum. The students participate voluntarily. [It] explains the reasons why the museum stayed in this municipality. It asks the students to identify which are the principal environmental problems and where they come from and explains to them what the solutions can be and ultimately they learn to differentiate the different types of forests and their animal and plant species. (IX, 14, 2) (7.STU) (2.K12)
- I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just third and fourth graders and just picking out the really good teachers. Like the teacher I'm working with now, she was named the best [teacher] of the semester so I was pretty excited about that and thought I must be on the right track. It seems to work because, ever since I've been working with her, she's got her friend who is another third grade teacher and says, "I want you to do the same things in my class because we do everything together." and then I had the first grade teachers come up to me and say "We've been watching the third grade class and we want our students to have love of the environment." I just hope everybody doesn't jump on the bandwagon because I'm only one person. (VI, 4, 8) (7.TEACH) (XX)
- So, I'd say that's the best way to get programs to work—to ask for volunteers or to target teachers that the school identifies as being willing to take on the extra work. Like, my teacher stays after hours and stays after class. They stay at the school all day Friday until 5:30 and plan. (VI, 4, 8) (7.TEACH) (XX)

b) Involvement of Local Community Members in Environmental Education Programs

Although formal education through the K-12 school system is often the first environmental education avenue that comes to mind, another important audience of environmental education is the non-formal, community member audience. Programs that involve these important stakeholders help improve the general level of education in the community and often help to address environmental issues at their roots, such as agricultural run-off, improper pesticide use, improper disposal of sewage waters, and so on.

- But I figured that if people are interested in learning about [solar ovens] and it's some kind of knowledge that I know, and they're interested enough to organize themselves, I'll teach it to them and then if they're going to use it tomorrow or maybe use it three years down the road, at least they'll have the knowledge and they have an alternative. (VI, 3, 3) (7.COM) (XX)

- With the pila septica—the holes for the [sewage] water—we've already given the [talks] to the brigade and the brigade is going to teach the people how to do it in small groups. They're going to pick small groups of people that need them and then they're going to work together and build one in one patio and then go the next patio and build one. You have to get the people involved. It's kind of missing the point if you don't have them involved. If you tell them the [mayor's office] has donated materials and this organization has donated this and this organization has donated that so we're going through these holes in the ground for you—please throw your dirty water in it. It just doesn't mean as much as them going out there and actually making the hole and putting it in there and understanding what it's for, understanding how it works. (VI, 4, 10) (7.LOC) (8.K; 8.COMM; 2.SW)
- The best programs are the ones that make people find their own resources and the time. Those are the ones that are going to last. If you just come in here and throw a bunch of money and or books in the schools and say "Here's your money/books now do it" I don't think it's going to work. It's been a really big struggle. Things have been coming along well—now, it's like they don't need me and they don't want me anymore. They're on a roll now and are like "We got this going and we understand what we're doing," and most of the time they kind of overlook me. I kind of feel like it's better because they're learning to use their own avenues to get things done and aren't always knocking on my door. That's definitely one of the things—start small. Just get them to do it. Things don't have a lot of value here if they're just given away. If people have to pay for things or work for it, it has more value. There are avenues for it—there are people who are willing to work and there's definitely time—many people have extra time on their hands. (VI, 4, 11) (7.LOC) (XX)
- So, I tried to find some people that wanted to do things in the community and that's when we formed the Municipal Brigade which is some kids in high school but most are either in their last year or they're in the university. (VI, 3, 2) (8.COM) (XX)
- And this is what I see the possibility of the [departmental environmental education] commission doing—is being able to start off with that, with some kind of meeting project where they go around and do that with each neighborhood and finding the neighborhoods that have serious problems that they want to solve. I think that's what the commission's job is. But right now they see themselves as figuring out the problem, figuring out the solution, making the project and finding the resources, and that's just, like some people have come to the commission meetings with projects and they have this letters that says, "We would like to do this project. It will cost this." (VI, 3, 5) (8.GOV) (XX)

Another important aspect of community involvement in environmental education projects is to include local community representatives in the departmental commissions and other decision-making bodies. Often the people who are invited to serve on these commissions do not have the time or the interest to fully participate in the process nor are they the ones who are most severely affected by environmental problems in the department. However, representation of local, working-class community members on these commissions helps to gain buy-in and build support from citizens in all areas of the community, with diverse interests and socio-economic backgrounds.

- Each protected area [GreenCOM works] with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.COM) (2.INT; 8.TEACH; 8.GOV; 8.NGO; 8.PRIV)
- [The] research design [in Chacocente was] created by GreenCOM with involvement by local people and protected area personnel but research itself being conducted by an independent local contractor. (VI, 2, 5) (8.COM) (2.STU)
- In the [departmental environmental education] commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and communal leaders, etc. This is partner organizations helping the environment. The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.COM) (8.GOV; 8.NGO; 8.PRIV)

c) Involvement of Government Personnel in Environmental Education Programs

It is critical to involve key decision makers and stakeholders in environmental education programs, both at the national and departmental level. To have support for local level environmental programs, decision makers with power over funds as well as human resources must believe in the importance of this type of education. Programs that include government personnel as key audiences have made important steps toward improving communication between levels of decision-makers and toward bridging the gap that often occurs between the government personnel residing in the capital city of Managua, where the government is based, and the citizens of Carazo.

- Ministry of Education, local NGOs are also involved [in environmental commissions]. Last Friday, commission meeting for one county, 60 people attended, local NGOs, governmental representatives. (II, 1, 3) (8.GOV) (XX)
- [MARENA] held a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives. (II, 1, 8) (8.GOV) (XX)
- Each protected area [GreenCOM works] with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to

work together through a guided practicum period. (VI, 2, 2) (8.GOV) (2.INT; 8.TEACH; 8.COM; 8.NGO; 8.PRIV)

- For example, with the environmental commission, things opened up so much better because the [health center] was actually talking to/working with the [mayor's office] on all these problems—it wasn't like everyone was running around and trying to solve these problems in their own way. (VI, 4, 3) (8.GOV) (XX)
- We had government and NGO participants [at the National EE Conference], environmental educators, a few teachers, more people working in EE projects or NGOs. (I, 5, 7) (8.GOV) (8.TEACH; 8.NGO)
- In the commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and community leaders, etc. These are partner organizations helping the environment. The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.GOV) (8.COM; 8.NGO; 8.PRIV)

d) Summary of Successes of Environmental Education Programs Currently Underway in Carazo

Several elements can be detailed as those which contribute to successful environmental education programs as defined by citizens of and workers in Carazo. These elements include student, teacher, and community involvement as well as buy-in and support from local governmental representatives and decision-makers. The elements of successful environmental education programs in Carazo that are perceived to be crucial ones center around involving key stakeholders in the programs.

2. Problems with Environmental Education Programs Currently Underway in Carazo

Through personal interviews, factors were identified that were considered representative of problems with environmental education programs currently underway in Carazo. The information provided in this section is a compilation of data gathered from this source.

When discussing the data gathered regarding problems with environmental education programs currently underway in Carazo, the old adage "Those who live in glass houses should not throw stones," comes to mind. It must be noted that the results presented in this section are not intended to discount the previously mentioned successes of current environmental education programs in Carazo; rather, the results in this section can best be viewed as suggestions for aspects of programs which can be improved upon and learned from in the development of future programs.

Personal interview subjects were asked about environmental education programs offered by their organizations as well as programs offered by other organizations. The subjects were then asked to describe the perceived success of all programs mentioned. Also included in a discussion of the problems with programs currently underway are some general barriers to environmental education in Carazo mentioned by interview subjects.

Some of the problems and barriers mentioned under this heading may also have been mentioned with relation to specific programs described in 4-II-B, “Environmental Education Programs Currently Underway in Carazo—Topics, Participants, Strengths, and Weaknesses.” In this section, however, the problems and barriers will be discussed in a general format, highlighting overarching problems that reach beyond individual programs and are broader indicators of problems with program planning and design across the board.

a) Lack of Knowledge, Time, and Interest of Program Leaders

As highlighted in the program successes section of this chapter (II-C-1), support and buy-in from decision makers at all levels is a key to having a self-sustaining program. It is critical to have program leaders who are dedicated, knowledgeable, and enthusiastic not only about program development but environmental topics as well. These leaders must also be people who are willing to put in a concerted effort and extensive amounts of time to ensure the continuity and effectiveness of programs.

i) Lack of Program Leader Interest

Interview subjects, especially representatives of international governmental organizations and NGOs, expressed concern over the lack of interest on the part of project leaders or figureheads.

- When [the Germans and ADECA] moved out they wrote the [tree nursery] property over to the mayor’s office and the mayor had little or no interest in running the tree nursery. (VI, 3, 1) (6.LINT) (XX)
- Then the mayor’s office decided to clear out the tree nursery. So, they cleared it out and I just moved on because I didn’t find anybody to support the project—nobody was going to lead it, nor did they care. (VI, 3, 2) (6.LINT) (XX)
- [ADECA], as far as sustainable environmental education that will actually change the situation of Diriamba or Carazo, I don’t believe they’ve been effective. Basically, I think they’re just keeping themselves going on what money they get and so I don’t think they have

a real interest in the environment or a long-term strategic plan. They don't have a sustainable plan. They have projects, we'll do this project, we'll get done with it, we'll move to the next project. And they're a little bit concerned . . . like, personally, I think they're concerned that their projects go on. Like I think that they would love to see them continue but when they fall apart, they're not really that upset about it because they've got a new project they're working on, they have to worry about. (VI, 3, 6) (6.LINT) (XX)

- I think the problem is with education, [the teachers are] just not really into the program. The teachers here are really struggling—just to meet all the requirements of the other programs. I've seen a lot of really interested teachers and a lot of really disinterested teachers, but there's not much in between. (VI, 4, 4) (6.LINT) (XX)
- Another [Peace Corps] volunteer lives across the road from me and she has a lot more problems—I think because her school is larger and teachers aren't that interested in working. They're not as involved with the community and with the students' lives. (VI, 12, 2) (6.LINT) (6.CONN)

ii) Lack of Program Leader Knowledge

Many of the project leaders were perceived to have a lack of interest probably because of a deeper problem—lack of knowledge and understanding of critical environmental issues. It is difficult to be passionately concerned about and involved with an issue if the issue is not well understood.

- The mayor's office was to take [the tree nursery] over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone have anyone who had any idea what was going on with the tree nursery. So, lack of a knowledge of what was a tree nursery and what went into making a tree nursery and what went into running a tree nursery. (VI, 3, 1) (6.KNOW) (XX)
- And a lot of schools only see certain problems, they see garbage and they see deforestation. And they only see certain solutions for that—sending the kids to pick up garbage or planting trees. And they don't see the realm of planting trees that includes finding the seeds, finding the bags, finding the dirt, taking care of it, then planting it, then taking care of it afterwards. They just see getting the tree, sticking it in the ground, then going away. And the same with the garbage—they just see picking up garbage, they don't see talking to people, having the kids investigate how to make natural fertilizers, composting. (VI, 3, 4) (6.KNOW) (XX)
- It's just the teachers don't know how to do it, and also the kids are really separate from the project. Teachers and principals don't have any consciousness, they don't know what is environmental education, nor do they care. (VI, 3, 4) (6.KNOW) (XX)
- When you ask [the teachers], "How long does it take plastic to decompose?" They'll say, "Two days," and you'll respond, "But you have a plastic cup in your house and how long has it been sitting on the table?" They seriously don't have the knowledge about a lot of areas. (VI, 4, 5) (6.KNOW) (XX)

iii) Lack of Program Leader Time

A final issue that was perceived to be a contributing factor to problems with program leadership was a lack of time on the part of project leaders.

- So, the kids liked the idea of working on the weekends—they always participated then. But as Peace Corps, we need to work with other Nicaraguans—and I couldn't get the teachers to do it. Well, I got one teacher to do it maybe two or three Saturdays and that was all and he no longer wanted to do it. He resigned from being the [ecological brigade] leader. (VI, 3, 2) (6.LTIME) (XX)
- And the schools are the same thing, all the teachers have a million classes, they don't get paid very much, they have certain hours, their principals have a million other things. (VI, 3, 6) (6.LTIME) (XX)

iv) Summary of Program Leadership Problems

Lack of interest, knowledge, and time on the part of project leaders were perceived to be critical problems with environmental education programs currently underway.

b) Lack of Sustainability of Foreign or NGO-Supported Programs

Many environmental education projects supported by foreign development agencies or NGOs are successful for several reasons. First, most international or NGO organizations that fund environmental education projects are able to pay the project directors, even if the stipend is small. This ensures that there is a full-time person, specifically assigned to work on environmental education projects supported by these groups. Also, there tend to be more financial resources available for projects funded by foreigners or NGOs, and they help the projects to be sustained over the life of the original investment of the supporting organization.

- So I find mostly it's the volunteers that work in the area, and it tends to be the foreign volunteers because they're paid a certain amount of money because that's their job and so they seem to be effective. The problem is that they're not from here so they only stay so long and then they go home and even though all of the organizations I've seen have good intentions and they want you to work with someone else, the people you're working with either in MARENA or MED or they have other things to do, there's nobody set up for just this problem or just to concentrate on it. So, they seem to be more effective. (VI, 3, 6) (6.FOR) (XX)

Problems arise, however, when the foreign or NGO workers leave the project to be a self-sustaining entity. It is often extremely difficult for these workers to find counterparts in the

local community who have the interest, knowledge, and time to take over the leadership of the project.

- Yes, and for that [Peace Corps volunteers are] supposed to work with a counterpart but like I said, the counterparts here aren't . . . like, we're to work with environmental education or forestry. Like, I was initially in forestry department but I was put with the mayor's office who didn't have anybody working in forestry to work with me. Yeah, he was told he was to give me a counterpart so he got me the woman who is in charge of the market. She doesn't know what's going on in forestry, nor does she care. So, that's the biggest problem is that they don't have the counterparts that will carry through. Or the counterparts they do have might have a little interest in environmental education like, right now Silvio Echaverry is my counterpart and he would probably like to do environmental education projects but he is the delegate so he has a million other things to do (VI, 3, XX) (6.COUN) (XX)
- A lot of stuff that I do kind of ends up at a dead end and I have to skirt my way around it. It took about three months for me to find teachers to work with because I was just driving myself crazy because I was working with the wrong teachers and they didn't have any interest in the program. I was trying to explain to them "This isn't my program. I'm not going to live here for the next 20 years and do this in your school." I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just third and fourth graders and just picking out the really good teachers. (VI, 4, 8) (6.COUN) (6.LINT; 6.FOR)
- I may be being negative because I know a lot of people have had projects and a lot of projects have been nice but to be effective, they've got to be sustainable. And I don't feel that I've been that effective either because it hasn't been set up where it can be sustainable. It's been set up where I do the work and then I leave even though I've been trying to find somebody to take over, there's nobody put in that position to take over. (VI, 3, 8) (6.FOR) (10.ONE; 6.FOL)
- At this point, there is no guarantee to ensure training continues for new employees—it depends on the government continuing to support the office after GreenCOM is gone—hoping for the multiplier effect to occur but not formally incorporated into the workshop design (i.e. recently, a ranger who participated in a training approached [me] wanting to conduct their own workshop for their park personnel). (VI, 2, 4) (6.FOR) (6.ONE; 6.FOL)
- When I leave, nobody's going to take control. (VI, 3, 8) (6.FOR) (6.FOL)

c) Lack of Funding and Resources for Environmental Education Programs

Another major problem that was identified regarding the sustainability of environmental education programs in Carazo was a lack of committed funding and resources. Although there are numerous organizations who are providing funding for environmental projects (or who are interested in providing funding for environmental projects), many of these sources are not well known and not well publicized. (For a further discussion of monetary resources available to

environmental programs in Carazo, see the section describing resources under III-C in this chapter. For a list of environmental project funders, see Table 4-13 in section III-C.) With resources (including printed materials, audio-visual materials, guidebooks and so on) it was apparent that, while there may be resources available, information about how to obtain the resources is not accessible.

Lack of funding directly affects programs currently underway as program personnel must constantly be searching for additional funding sources to keep the programs up and running.

- For example, the ecological brigade in San Marcos, with the help of the mayor's office, is cleaning up the river. The MED does not have the resources to give transportation support so we made an agreement with the heads of households and they pay the gas and MED gives the bus. We have economic and human resources to continue and control the reforestation and environmental projects, and the jurisdictional aspect. (II, 16, 2-3) (6.\$) (2.ECO, 14.PRIV, 14.MED)
- There are a few Nicaraguan volunteers that are effective but only once in awhile and you can't really blame them because they're pure volunteers and they're not getting paid any money or help and most of them have the need for it so their interest dwindles—it comes on some projects and goes away on others. (VI, 3, 6) (6.\$) (XX)
- As far as sustainable environmental education that will actually change the situation of Diriamba or Carazo, I don't believe [ADECA has] been effective. Basically, I think they're just keeping themselves going on what money they get and so I don't think they have a real interest in the environment or a long-term strategic plan. (VI, 3, 6) (6.\$) (XX)
- So I try to find other volunteers in the community who would possibly like to take control. But I can't force them to and their animation level goes from high to low because they are volunteers and they're looking for other work because there's nobody assigned just to that. (VI, 3, 8) (6.\$) (XX)
- [Interviewer] And do you have any ideas why there weren't as many people [at the second national environmental education meeting]—because at the first meeting, there were lots of people. [Subject One] The location, probably. [Subject Two] We didn't want it as big because it's very expensive and here in MARENA they say that environmental education is a priority but it's not so. [Subject Two] When it comes to support, they seem to forget. [Subject Two] We have the money but you see that they don't have confidence—they question and so we decided to make it a little smaller. (I, 6, 4) (6.\$) (XX)

Additionally, lack of funding affects programs in planning as start-up funds to provide salaries, supplies, publicity and so on are critical to getting programs off the ground.

- Three things [MARENA is] working on: a strategy, the pilot program and a campaign that we are trying to design for the next four months but we don't have enough money so I don't know if we'll be able to do the campaign that we're trying to do. (I, 5, 3) (6.\$) (2.CAM; 2.NATL)
- The departmental commission on environmental education is trying to work on some of these problems [soil erosion, deforestation, disappearance of native species, water pollution, pesticide poisoning, lack of EE programs] but they need help finding funding to promote projects. (II, 7, 1) (6.\$) (XX)
- [The Peace Corps environmental education curriculum guide] is used only by the Peace Corps volunteers because we don't have the money to use it with the teachers. I wrote a grant trying to find the funds but we didn't get it. We will have, in October, a group meeting of all EE volunteers to incorporate this—there is more information that they have developed—they will have one manual just in case we have the money in the future so hopefully the teachers will have them. We're planning to introduce this manual to the Minister of MED so he can lobby somewhere for the money. (VI, 13, 9) (6.\$) (9.WRK; 14.MED)
- Finding financing for projects is also a big barrier to environmental education. (II, 7, 1) (10.\$) (XX)

It is also important to note that lack of funding does not only include non-formal education programs but also applies to the salaries, supplies, and incentives formal educators are given for teaching and providing environmental programming.

- The resources are very scarce and we should try to do more things. They have the science, and [I don't]—the salary they get is very little so the things they do—they don't do it because they want to get an economical reward but that they do it because they want to have a more beautiful environment. [We] have a more beautiful place as far as scenery than Guatemala and some of the rewards that [the teachers] get is that [we] have the opportunity to go to some places with the school like Masaya, Mombacho, and some other places so that's the fact that's rewarding to [us]. (VII, 10, 4) (6.\$) (10.\$)
- The barriers I first noticed when I got here were the teachers—I mean the teachers don't make much here. They really don't make enough money to support a family and a lot of them have second jobs which means they're leaving the school right after school and going to a second job. (VI, 4, 5) (10.\$) (10.TIME)

Finally, lack of resources (including printed materials, audio-visual materials, guidebooks, and so on) affects the quality and amount of environmental education programming offered in Carazo. The more difficult it is for program staff to obtain these materials, the less likely it is that the materials will be widely used and distributed.

- Usually there are no resources—no libraries so it is difficult for the teachers and that's why we are using very basic activities for which they don't need a lot of background information. But there are some areas—in Chontales, this department where a Dutch NGO developed a guide with the Peace Corps volunteer that has all the background information about the local natural resources and they have trained a lot of teachers in the department to use the manual but that is not common in the different regions. There are some departments with the big cities, like Leon, where they have more than one big library but, in general, teachers don't have resources to gather information for use. (VI, 13, 10) (10.RES) (XX)
- Lack of environmental education resources. Almost all of the ministries and organizations at the municipal and departmental levels need a bigger budget in order to achieve all of their goals. (II, 16, 2) (10.RES) (10.\$)
- The ones that really want to do [in-service training courses] are interested, but they just don't have the activities and the resources and stuff like that. (VI, 4, 7) (10.RES) (9.INS)

d) Lack of Planning and Coordination among Organizations and Agencies Involved in Environmental Education

Several interview subjects expressed frustration with the lack of communication about environmental education programs and efforts taking place in Carazo. Frustration was also voiced regarding a lack of cooperation among different government agencies, as well as between government agencies and non-governmental organizations.

- [MARENA has] pointed out that we don't want to have the efforts be dispersed, to be doing several things at the same time. We have told the county and rural commissions that they must take care of their own initiatives and try to solve their problems at a local level unless something gets out of hand then they can come to the state level for support; but whatever they do, they must not disperse their efforts, everything must work through the proper channels so that several organizations are not doing the same thing at the same time and to use the resources more rationally. (II, 1, 10) (6.COMM) (XX)
- Also we have the problem of jealousy. Everyone wants to take credit for the accomplishments but few want to work together. We need more cooperation between the ministries, teachers, and organizations. (II, 16, 2) (10.COORD) (XX)
- Well, the role of [MARENA's environmental education] office is getting clearer, clearest but environmental education needs a big project, that we don't have right now who helps different institutions to do things—help the Ministry of Health, the Ministry of Education, the civil society needs to work, to do things around environmental education. (I, 6, 5) (6.COMM) (XX)
- [I] would like to add is that there are some organizations, like the one we just mentioned, Farmer to Farmer, where some more information, some other educational material could be obtained and [I would] be more that happy to get in touch with these other organizations, whatever is possible, in order to be able to obtain that kind of material and also to get a better

coordination at national level because a lot of efforts are duplicated because a lot of organizations are working by themselves and probably if we coordinated actions a more efficient type of work will be done. (I, 11, 4) (6.COMM) (14.FTF)

- I think that we need to start—the Minister of Education, we have barriers but I think they're not . . . I'm afraid of expressing that we have a barrier because up to now, we haven't had a problem with this formal sector so how can I tell you that we had this or that barrier. They have this ability—if we talk about local NGOs who are trying to do EE, we have had problems with the MED because they have destroyed some projects in Matagalpa and they have also destroyed some materials that an NGO has designed because the MED didn't agree with the philosophy of the material. You might say that this is a big problem but if we go through national channels, if we work with them together, I think we'll have good results if we try to coordinate with them and not do efforts separately. They are very sensitive—they have their philosophy. We might not share their philosophy but, if you want to work with them, you need to coordinate with them. (I, 5, 7) (10.COORD) (XX)

Several interview subjects suggested that a major problem with programs currently underway was the lack of one organization or committee to assume a leadership role in organizing environmental education efforts. Along with this, the subjects expressed frustration and confusion in deciding which, if any, organization or agency should take the lead in environmental education.

- See, one of the things that it seems to me has sort of a negative impact on the environmental education strategy is that no organization has assumed the direct responsibility. In the beginning, it was the Ministry of Education but then you end up with most of the people in MARENA doing the work—even promoting the consciousness. Probably that's one thing that has a negative impact on it. (I, 6, 5) (6.COORD) (XX)
- I don't think that the formal Ministry of Education will be the best avenue. I think we need a big umbrella that can set a commission that manages a project that will make all the institutions work and help the different institutions. As Don Silvio [Echaverry] said, to assume—we need that different institutions and civil society assume this responsibility for environmental education and the Ministry of Education in formal education by law has to assume but it's not enough. It's just a very slow way. The Ministry of Education needs the communication media to get together. It can't be just the Ministry of Education or MARENA—you need a bigger umbrella and integrated parts. (I, 6, 5) (10.COORD) (XX)

e) Lack of Governmental Commitment to Environmental Education

The lack of true and committed governmental support of environmental education frustrated many interview subjects. Although the government has made major efforts on the part of enacting the “General Environmental and Natural Resources Law” as well as enforcing the 60 hours of ecological work requirement for high school seniors, no significant amount of funding

has been put aside for environmental education causes, and not many national-level governmental employees have been designated as focusing specifically on environmental education. It does not appear that environmental education is a priority to the national government.

Comments regarding the lack of funding provided for and budgetary constraints of environmental education programs included:

- The least [financial] assistance [Diriamba's ecological brigade] gets is from the Ministry of Education because environmental education is not a priority to [MED]. (VII, 10, 3)
- [With] the Minister of the Environment, MARENA, it looks like every year the budget is getting smaller and [they] get less money and less resources to work with and this is the reality (VII, 10, 4) (10.PRI) (5.MARENA)

Human resources constraints (lack of one person specifically assigned to focus on environmental education) were mentioned even more frequently than monetary constraints. Several interview subjects elaborated on this problem with reference to the 60 hours of ecological work as well as other programs currently underway.

- Before there used to be an ecological brigade direction at the central level in MARENA and they even had a building where they had kinds of activities. But since they closed the department, the ecological brigades are run by themselves so the kind of activities they get involved in—it depends on the kind of local leader they have. (VII, 10, 4) (10.PRI) (XX)
- It would be nice if each mayor's office was required to have somebody who was actually trained in coordinating and doing all of this or MED had somebody or MARENA had somebody—that there were some people who were dedicated to environmental education formally and non-formally. I mean, I think they'd have better results if there was somebody who was just paid to do that job and they were well-trained or even the organizations had somebody just in that. Like they have these organizations and they have this one person doing a million things—how to talk to the producer, how to grow pigs, here and there—they don't just have the environmental education, so they might help out on one project and they realize they're not getting anything out of it so they just go on. (VI, 3, 6) (6.EE) (XX)
- [The small number of people hired to focus on environmental education] tells me, in itself, that even though MARENA, as the Ministry of Natural Resources, they don't find environmental education important. They've set aside four people at the national level and they sweep in, every once in awhile to the Carazo office, and they want to see what kind of environmental education is going on, they make a list, they bring it back home to the central office and they say, "Look—these are the environmental education projects that MARENA is doing." (VI, 3, 8) (6.EE) (XX)

- Everybody wants to take credit and put down that it's important to them, but it's not important to them. It's not important to MED either. Yeah, they have this 60 hours, they have this new environmental law but it's not important to them because they don't have one person set aside to make sure, on the departmental level they don't—and they have thousands of students. On the municipal level they don't either. In the schools, they might have one teacher to do their fifth year, or two teachers . . . these teachers don't know anything. (VI, 3, 8) (6.EE) (XX)
- Everybody is signing the law saying this is a good idea but I don't see this being a priority for them because they haven't set up somebody to take care of it. I mean, if it was a priority problem, they would have somebody in there doing it. (VI, 3, 8) (6.EE) (XX)
- A project has been presented to Congress for the regulation of forest projects has been passed on to the Ministry of Agriculture and that it probably will leave the MARENA delegation in a short time—and I hope it works out because too much time is wasted. It would give more time to environmental education—we feel underrated—we want to do something else to support environmental education. So we can then pass this work on to the Ministry of Agriculture. (I, 6, 5) (6.EE) (XX)

The lack of government support is manifested in the small amount of financial and human resources that are directed toward environmental education projects and programs. It appeared that interview subjects were more concerned about the lack of human resources support than monetary support and were demanding that the national level government, both through MED and MARENA, reevaluate their priorities with regard to environmental education.

f) Lack of “Real Life” Relevancy in Environmental Education Programs

The environmental education programs currently underway in Carazo were criticized by the interview subjects as the programs frequently lacked a connection to daily life. The programs cited often focused on trash clean up in the school yard, but did not extend this learning to the city streets. If a program talked about cleaning up the beach, a connection was not made between the beaches and other natural habitats and ecosystems. Although the basic idea for an environmental education message was present, no connections were drawn to “real life” outside of school or outside of the singular, isolated environmental education efforts undertaken through the ecological brigades, in the classroom, or through the 60 hours of ecological service work.

Programs that lacked relevancy to real life also failed to engage the interest of participants. Programs that dictated on which projects students would work removed the element of personal choice and autonomy from the process, further removing the students from a true interest in and understanding of the environmental subjects being addressed.

- Another problem is that the kids aren't involved, the teachers tell them what to do. Like this weekend we're going to pick up trash on Saturday and all the kids go along and they just do it, they don't know why they're doing it or anything. (VI, 3, 4) (6.INT) (XX)
- "We had to go clean up trash." But that's not environmental education. They're not getting any consciousness of what's going on, they're not learning anything about the environment or what its needs are and what their place in taking care of it is. They're just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don't even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 7) (6.INT) (XX)
- But, I find that they have a lot of problems too because, even though I've been trying to give them an environmental conscience, they know that there's a problem there and they're in an ecological brigade because of it but, the same kid, you can give a lecture on garbage and why we don't throw it into the streets but then afterward everyone can have a piece of candy and I'd say that 95 percent of the papers go into the street—right after the talk. And, it doesn't only happen with them—it happens in the schools too. You'll go into a school and it might be their week of the environment and they have all this stuff that says "Clean up" and they actually might have a trash cans around and all the kids throw it in when they're in the school but they walk outside and buy a bag of something and throw it on the ground right away. (VI, 3, 2) (6.CONN) (XX)
- Lack of environmental education. We would like to have a campaign in the community to help us with educating the students. When they return to their homes, they forget what they have learned in school. (II, 16, 2) (10.CONN) (XX)
- But now their attitude has changed a lot. Once they started doing more stuff, they had more pride, a lot more pride in their community. That's an important thing—try not to cut off the education from the community. With the culture here, it has to be a community thing. It can't just be like "Okay, we're going to throw these [talks] in the schools." The way the health and ecological brigades work, we're going to go door-to-door. It sounds so old fashioned but that's what you have to do here—you can't send nice, little typed up letters to their house so we go door to door. (VI, 4, 4) (6.CONN) (6.INT)
- A big restriction is that the kids don't live what they learn in school. I haven't met a lot of the parents but the attitude about school seems to be that you have to go to school now, but there's not any future in it so you're just kind of there and just kind of pushed to get the "passing" point and once you get to sixth, seventh, eighth, ninth grade, you drop out and try to work. (VI, 4, 5) (6.CONN) (XX)
- We're trying to preach these things in the school, and his mother is throwing plastic bags out in the road and burning plastic bags in the backyard. The kid is thinking, "Well, in school today we learned that plastic bags are bad for the environment but my whole family is doing it so why do I need to change?" I think that's a big part of it. (VI, 4, 5-6) (6.CONN) (XX)

Other times, the topics of the programs offered are not interesting to the participants or the participants do not see the topics as locally-applicable.

- The only problem with it is that it touches on different topics, but it isn't very specific to conditions/problems in the area and it's not very interesting. It's kind of boring. With the [talks] I give, I try to turn them into something they'll remember a lot more. (VI, 4, 4) (6.PINT) (XX)
- Because it seems like every time I teach or give a talk or workshop or something, people know that if you cut down a lot of trees around the river, the river will dry up. But they don't apply it to them cutting down the trees, that they're part of the problem. They see themselves as removed. They don't see the connection. They know what the problems are, they know what the solutions are, they just don't see themselves as part of anything. (VI, 3, 3) (10.CONN) (XX)
- Here in Diriamba I would say it's the same as in Carazo. People know and they take in things but they don't see it applying to their lives. Both the barriers—as far as their garbage, they know that it's dirty and it's gross and that it causes diseases. (VI, 3, 3) (10.CONN) (XX)

Some projects that do have carry-over to real life provide participants with suggestions on ways to remedy environmental problems through changes in personal lifestyles. These changes are sometimes difficult to implement and, therefore, do not realistically have an impact on local environmental problems and lifestyle decisions.

- Actually, we've never done any study on who has carried through using [the solar ovens]. I suspect the number is pretty low because it is a big change. (VI, 3, 3) (6.CNG) (XX)
- It's just . . . they know that the problems are deforestation but they'll be the first ones to say that they'd rather have their food cooked on firewood than on a gas stove because it has a better flavor. (VI, 3, 3) (10.CNG) (XX)
- I guess one of the biggest helps, what we've been trying to target with my teacher in this school, is trying to get parents involved. I think one of the biggest problems right now (why programs aren't succeeding) is that the whole community isn't involved. We're trying to preach these things in the school, and his mother is throwing plastic bags out in the road and burning plastic bags in the backyard. The kid is thinking, "Well, in school today we learned that plastic bags are bad for the environment but my whole family is doing it so why do I need to change?" I think that's a big part of it. (VI, 4, 5-6) (10.COMM) (6.CONN)

For programs to be successful, they must connect with real life learning and have carry-over into communities. Another aspect of this idea is the lack of follow-through that most of these programs have. There is not often any continuation of efforts beyond a single event or campaign. This problem is discussed more fully in the following section, "Lack of Follow Through and Evaluation of Environmental Education Programs."

g) Lack of Follow Through and Evaluation of Environmental Education Programs

Many environmental education programs in Carazo are one-shot efforts, modeled after the popular campaigns and parades. These programs often focus on critical environmental issues such as deforestation, water contamination, and solid waste management; however, many of them are singular events without a significant amount of pre-project planning or follow-up. Additionally, no programs mentioned in the personal interviews had evaluation measures, formative or summative, built into them as an integral component.

- But what they do is they sweep in, maybe an organization comes in and they're like, "Okay, we're going to focus on this, this year." And they give a talk and the teachers all learn about it and then they go away and it goes back to the way it was. And that's like a campaign, it's the same thing. And that's how everything in Nicaragua has been, as far as I can see—as far as development work or things to help out in the community. It's like there's this problem, everybody comes in, they have this big thing, they talk about it, and everyone leaves. Or it's once a year they talk about it, like violence in the home, they had this big violence in the home thing. And I'm not saying it's not good but the fact that it's not constant, always there, people don't see it as always being their responsibility, their problem, or something that needs to be taken care of. (VI, 3, 7) (10.ONE) (XX)
- And for a short time [the campaign or parade] is a success, but there's no long term follow-up or even long term plans for the environmental education. It's just, "We'll tell the kids this and we'll tell the people this and we'll have this campaign, we'll have this big thing." And then nothing else, it's not like included in everything. (VI, 3, 7) (6.FOL) (XX)
- There's not follow-up and there's not evaluation. It's a one time shot. It's fun for everyone but then it's over with. You do it for a week and then . . . that's how all projects are. (VI, 3, 7) (6.FOL) (XX)
- At this point, there is no guarantee to ensure [interpretive] training continues for new employees. It depends on the government continuing to support the office after GreenCOM is gone—hoping for the multiplier effect to occur but not formally incorporated into the workshop design (i.e. recently, a ranger who participated in a training approached [me] wanting to conduct their own workshop for their park personnel). (VI, 2, 4) (6.FOL) (6.ONE; 6.FOR)

In the interview subjects' descriptions of programs, none of them mentioned performing evaluations of the projects or talked about follow-through after one-shot projects such as campaigns and parades. These elements have not, to any visible extent, been incorporated into environmental education programs in Carazo at this point.

h) Summary of Problems with Environmental Education Programs Currently Underway as Determined through Personal Interviews

Seven elements were described by interview subjects as problems with environmental education programs currently underway. These elements were: lack of knowledge, time, and interest on the part of program leaders; lack of sustainability of foreign or NGO supported programs; lack of funding and resources for environmental education programs; lack of planning and coordination among organizations and agencies involved in environmental education; lack of "real life" relevancy in environmental education programs; and lack of follow-through or evaluation of environmental education programs.

D. Summary of Results Relating to Subproblem Two: Environmental Education Programs Currently Underway in Carazo

The data in this section are presented in the following manner:

1. Description of Environmental Education Programs Currently Underway
 - a) Formal Education Programs (K-12 and University)
 - b) Teacher Training Programs
 - c) Campaigns and Parades
 - d) Government Sponsored Programs and Initiatives
 - e) Technical Assistance Programs
 - f) Issue-focused Technical Assistance Programs
 - g) Environmental Education and Interpretation Programs in Natural Areas of Carazo
2. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Successes of Programs Currently Underway
 - b) Problems with Programs Currently Underway

Numerous environmental education programs are currently underway in Carazo. This is heartening as it shows that there is a large contingency of people committed to environmental education and improvement of the environment in this department. While the programs highlighted through the personal interviews and review of documentary sources were not necessarily ground-breaking projects, they did follow "tried and true" methods of providing environmental education to communities.

1. Description of Environmental Education Programs Currently Underway in Carazo

a) Formal Education Programs (K-12 and University)

Formal school programs in Carazo were found to be targeting elementary school and high school students as well as their teachers. Teacher training programs are offered through government organizations such as MED and MARENA. Additionally, many teachers reported having received some environmental education training, either through pre-service or in-service avenues.

The teachers passed environmental information on to their students as an overwhelming majority (95%) of teachers reported that they had included or were presently including teaching about the environment in their class(es). Classroom teaching on environmental subjects usually centered around issue-based learning (deforestation, solid waste management, and water contamination were the top three most frequently cited issues), inclusion of environmental education in traditional school subjects (most commonly science and social studies), and involvement of students in environmental action projects (usually focused on reforestation projects, and school or community clean-ups). Other K-12 formal school programs included ecological brigades and the 60 hours of ecological service work required for high school students.

Finally, university level programs and curriculum guides were formal education programs that are minimally underway. The Nicaraguan universities do not presently offer degree programs in environmental education, although some environmental education and interpretation classes are offered through natural science education or park management classes. Curriculum guides have been created for use in Nicaraguan departments, including Carazo, but the funds are not currently available to distribute these curricula.

b) Teacher Training Programs

Information on teacher training programs currently underway was gathered through the teacher survey data as well as data provided through the personal interviews. Many teachers reported receiving training in environmental education; however, few of them demonstrated knowledge and understanding of all of the components traditionally accepted as being central to environmental education (awareness, knowledge, attitudes and values, citizen action skills, and citizen action participation).

Through teacher surveys and personal interviews, it was determined that improved and increased teacher training is a critical need in Carazo. Teachers identified more training in environmental education as the most important factor that would increase their level of teaching about the environment in the classroom. Personal interview subjects also mentioned the importance of teacher training programs in increasing teachers' confidence in teaching environmental education and teachers' knowledge about environmental issues. Interview subjects expressed concern over the current design of in-service teacher training programs and felt that the time and funding spent on these programs could be more effectively used if the workshops were designed to include training on more active environmental education projects and methodologies. The interview subjects also stressed the fact that the teachers would not teach about subjects with which they were not comfortable, and that more teacher training could be a key to making teachers more comfortable with the topic of the environment.

c) Environmental Education Campaigns and Parades

Many environmental education programs currently underway in Carazo focus on campaigns and parades as methods of spreading information regarding environmental issues. These efforts are usually one day events, although some of the campaigns in Carazo last several days, depending on the topic, the time of year, the program's funding, and the number of participants. Some campaigns are organized through schools or through ecological brigades while others are community events. Funding and support for campaigns comes from diverse sources including MARENA, MED, and MINSA.

Environmental campaigns and parades are popular as they are well-received by the Nicaraguan public as well as teachers and students. The events fit in well with the Nicaraguan culture and are a fun, exciting way to spread information about environmental messages. Problems arise, however, in the lack of true community and student involvement in the environmental messages of this type of event. There is usually no follow-through, and personal connections to the environmental issues being targeted in the campaigns and parades are not made clear. Additionally, although these programs may be one of the most effective ways to reach diverse sectors of the population, they are often difficult to fund as they can be expensive, one-shot efforts.

d) Government Sponsored Programs and Initiatives

Governmental support does exist for environmental education in Nicaragua, although the actual financial and human resources dedicated to the field are slight. MARENA works with other environmentally-focused organizations and agencies to bring together interested individuals and agencies through annual national environmental education meetings that began in 1996. MARENA has also been working to develop a national level environmental education strategy to unify and streamline environmental education efforts throughout the country. One of the components that arose out of the national meetings and the process of developing the national environmental education strategy was to require each department to create a commission to focus on environmental education within their area.

e) Technical Assistance Programs

Technical assistance programs are widespread in Carazo. Many programs cited by interview subjects and in the documentary sources as being environmental education programs more specifically provided technical assistance to farmers, natural resource users, and other community members. Although not traditionally thought of as environmental education programs in northern countries, the reality in countries such as Nicaragua is that this kind of program provides much needed assistance and education to community members and agricultural producers, the individuals whose actions are often at the core of the environmental problems being faced by the department.

f) Issue Focused Technical Assistance Programs

Following on the heels of traditional technical assistance programs are those that focus on specific topics such as solid waste management, deforestation/reforestation, and alternative energy strategies. These programs are relatively widespread in Carazo and focus on non-formal audiences including farmers and agricultural workers, community members, and government agency workers.

g) Environmental Education and Interpretation Programs in Natural Areas of Carazo

There is an extensive national park system in Nicaragua that is administered through MARENA. One of the most developed national parks in the country, Volcan Masaya, is located just outside of Carazo. This park offers ranger-led programs catering to school groups. Visitor studies are being conducted by GreenCOM in conjunction with the University of Idaho to look at

ways to improve the interpretive and environmental education services offered at Volcan Masaya National Park.

Several organizations are working on providing environmental education training to interpreters in national parks and other natural areas in Carazo and around the country. The supporters of these programs include MARENA, GreenCOM, and Peace Corps volunteers working in certain areas of Nicaragua.

h) Health Related Environmental Education Programs

The main provider of health related environmental education programs in Carazo is MINSA. MINSA's environmentally-related programs focus on solid waste management, pesticide education, and water contamination issues. Other NGOs provide some health and environmental programs and there may be possibilities for more linkages between the two fields, to share financial and human resources while providing environmental education to a wider segment of the population.

2. Successes of and Problems with Programs Currently Underway in Carazo

Through personal interviews and the review of documentary sources, factors were identified that were considered to represent successes of and problems with environmental education programs currently underway in Carazo.

a) Successes of Programs Currently Underway in Carazo

The factors identified that were considered to be indicators of success focused on the inclusion of key stakeholders and decision-makers in environmental education programs. Specifically, the factors mentioned by personal interview subjects included: involvement of students and teachers in environmental education programs; involvement of local community members in environmental education programs; and involvement of government personnel in programs.

b) Problems with Programs Currently Underway in Carazo

Through personal interviews, the factors identified that were considered to be problems included a broad spectrum of issues and barriers to providing high-quality, effective environmental education. Specifically, the factors named by personal interview subjects and highlighted in documents were: lack of knowledge, time, and interest on the part of program

leaders; lack of sustainability in foreign or NGO supported programs; lack of funding and resources for environmental education programs; lack of planning and coordination among organizations and agencies involved in environmental education; lack of government commitment to environmental education; lack of “real life” relevancy in environmental education programs; and lack of follow-through or evaluation of environmental education programs.

III. Subproblem Three: To identify and describe existing resources for environmental education in Carazo.

Through this study, information was gathered on the resources available for environmental education in Carazo using two data-gathering methods: personal interviews and teacher surveys. These methods provided the bulk of the data that is presented in this section. Because of that, this section will begin with a description of the manner in which this information was gathered through each of the methods. Then the data gathered relating to subproblem three, resources available for environmental education in Carazo, will be organized according to resource type, with data gathered from both sources compiled in each section.

A. Personal Interview Data

In the personal interviews, the subjects were asked what resources their organization had available to the public for teaching about the environment or environmental education. If their organization had resources available, the subjects were then asked in what manner these resources could be obtained by teachers or environmental educators in Carazo.

If the interview subject was not from an organization that would usually provide resources but, rather, was from an organization that was more often the user of resources provided by others (such as an ecological brigade leader), the subject was asked what environmental education resources s/he had available to her/him.

The data gathered through these questions was used to compile the results from subproblem three, environmental education resources available in Carazo.

B. Teacher Survey Data

The teacher survey contained three questions that related to resources available in Carazo for teaching about the environment. Question number 5 asked teachers, “What resources do you have available for teaching about the environment?” Provided was a list of multiple

choice responses that included: textbooks, natural areas, posters, local parks, brochures, picture books, magazines, community members, school forests, museums, environmental experts, filmstrips, video cassettes, audio cassettes, films, scientific models, and a category that read, "other: please describe" in which teachers could fill in any other resources that they had available that were not included on the given list.

Question number 6 on the survey asked teachers what they perceived to be the greatest barriers to teaching about the environment and one of the answer options offered here was, "lack of environmental education resources." Similarly, question number 7 asked teachers which factors would best motivate them to incorporate more teaching about the environment into their classes and one of the answer choices was, "more access to environmental education resources."

The answers to these three teacher survey questions were used to compile the results from subproblem three, environmental education resources available in Carazo.

C. Personal Interview and Survey Results Regarding Environmental Education Resources Available in Carazo

In the personal interviews, subjects were asked about two components of subproblem three, environmental education resources available in Carazo. The first component was, "What environmental education resources are available *from* your organization?" The second component was, "What environmental education resources are available *to* your organization?" If not clear from their answers to these questions, the subjects were then asked, "How can these resources be obtained?" To touch on the aspect of financial resources available, information was also noted on organizations or agencies that provided funding for environmental education programs and projects mentioned during the interviews.

In the teacher surveys, the teachers were asked to indicate which environmental education resources were available to them, based on the list provided. The percentages of each answer were calculated based on the answers given by the 81 out of 83 teachers who answered this question.

1. Printed and Audio-Visual Resources

During the personal interviews, more of the subjects mentioned resources available *from* their organization than *to* their organization. The materials mentioned that were available *to* their organizations included curriculum guides (4 mentions); textbooks (1 mention); posters (1 mention); pamphlets or brochures (2 mentions); and bibliographies (1 mention).

Resources available *from* the organizations represented by interview subjects included: curriculum guides and textbooks (9 mentions); posters, pamphlets, and picture books (6 mentions); local parks and natural areas (3 mentions); training guides (3 mentions); conference proceedings (2 mentions); and bibliographies (1 mention).

a) Textbooks and Guides

With information gathered through the personal interviews, textbooks and curriculum guides seemed to be available through several organizations. Many of these books or guides had been specifically tailored to focus on Nicaragua, and some of them were even tailored to a departmental level.

- There are seven chapters in [MAN's environmental education curriculum guide] and it's more or less to give teachers an idea of how to incorporate EE into the classroom. [We] have ideas like examples but they leave a lot of it up to the individual teachers as to how they teach it. For example, in Masaya [the teachers] developed more of their EE on water because that's what they're the most worried about and they developed their own songs, social dramas and poems specific to the area of Masaya. They used the book as a guide but then they did their own work. It also helps the teachers not to have such a rote learning system which a lot of the teachers have. They also instruct people on things you can do in the house to help the environment. (IV, 20, 5) (4.CURR) (2.CURR)
- NAAEE is going to bring book packages for environmental education already translated into Spanish [for their workshop in June 1998]. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (3.TEXT) (3.CURR)
- There are few resources. In written materials [MED has] only those [resources] which MARENA gives us or natural science texts, making use of the Ecological Museum. (II, 16, 2) (4.TEXT) (4.MUS, 4.CURR)
- They have [information] in their [MED curriculum] guide book that tells what the teachers are supposed to include, what to teach the kids. (VI, 3, 4) (3.CURR) (XX)
- At the Ministry of Education level, [teachers] get some support as far as literature and illustrations and things of that sort and bibliographies—and there's some of it but [I think] it's not enough and . . . there's a lot of need to improve that. (I, 11, 4) (4.CURR) (4.BIB)
- We started using this book that was developed by Peace Corps volunteers and the MED in Guatemala and everything is active education. They use 10 different general topics usable in almost any community. For example, awareness of the environment, animals, trees, garbage, water, soil, protected areas, populations and sustainability, sustainable development and environmental ethics. Everything is with games and dynamics. (VI, 13, 9) (4.CURR) (XX)

- I have a committee in Panama that is also working with Peace Corps in EE but they started working in curriculum development with the MED so they created for each grade a manual. This is the second grade—it has all the different courses: Spanish, math, natural science, and each one has objectives, a topic and a dynamic. We started using this with the Nicaragua curriculum and came up with this guide created by a Peace Corps volunteer and the MED in the community. What she did was using this to incorporate EE into the Nicaragua curriculum. Now it says for each course from first to third grade what to do. (VI, 13, 9) (4.CURR) (14.MED)
- For example, this was a training that was sponsored by a [Peace Corps] volunteer, she did from fourth to sixth grade for example two days of the week and then gave out the manual. (VI, 13, 10) (4.CURR) (2.TTNG)

However, the problem with the curriculum guides and textbooks already developed is that there is often not enough funding to distribute them once they have been created.

- And at certain localities, like in Chinandega and some other places, some organizations like the Peace Corps, they have elaborated some kind of material that they are using but [I think] that that material should be duplicated and should be sent to other communities so that they can use it so what's being done right now as far as providing those resources is not enough . . . (I, 11, 4) (4.CURR) (XX)
- I don't think it's very effective to say "We have these Nicaraguan resources" which [Peace Corps does]—we have a book created with activities for Nicaragua, but we don't have the funds to get them printed. (VI, 4, 7) (4.CURR) (6.\$)
- An important thing to mention is that the labeling that is in these environmental guide books is indispensable—this is a book done with MED in Nicaragua. It actually lists all the activities and at what point they apply directly to the curriculum so the teacher can go through her book and mark what areas she has activities for. [Interviewer] Most of the teachers don't have copies of this book, right? [Subject] No teachers have copies. [Interviewer] This is the one that the Peace Corps is trying to raise money to distribute? [Subject] This is the one that Peace Corps made. There are two of them—first through third and fourth through sixth. (VI, 4, 8) (4.CURR) (4.TNG; 6.\$)

In the teacher survey, 74% of the 81 teachers who answered question 5 (asking about environmental education resources available) reported having textbooks available to them to teach about the environment. In light of the percentage of teachers who said that they include teaching about the environment in their science classes (44% of the total of 54 teachers who reported infusing environmental education into traditional classroom topics) and social studies classes (15% of the total of 54 teachers who reported infusing environmental education into traditional classroom topics), it can be assumed that the majority of the textbooks to which these

teachers were referring when asked about environmental teaching resources would be science or social studies textbooks.

b) Posters, Pamphlets, and Picture Books

Posters, pamphlets, and picture books are excellent resources for formal educators to use in teaching about the environment. During the personal interviews, several subjects mentioned that their organizations or agencies had these types of printed resources available to teachers and environmental educators, and some subjects knew of other places that offered this type of material.

- Volcan Masaya is the exception in terms of resources available—they have more materials, including posters and brochures, and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed. (VI, 2, 7) (4.PAM) (4.POST; 4.NAT; 4.PARK)
- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.PAM) (3.PICT; 3.POST; 3.TNG)
- Sometimes [MED gives] out a little pamphlet that tells [teachers] what they could do. Like they have a list of activities they could do with the kids. (VI, 3, 8) (3.PAM) (XX)
- [Interviewer] And MARENA has brochures and posters and that sort of thing? [Subject] Yes. (VII, 10, 4) (3.PAM) (3.POST)

In the teacher survey, 37% of the 81 teachers who indicated that they had any environmental education resources available to them mentioned having posters available; 30% mentioned having brochures or pamphlets available; and 23% reported having picture books available. Additionally, 20% of the teachers reported having access to magazines, a resource that was not mentioned by any of the interview subjects. In summary, materials such as environmentally-related picture books, brochures, posters, and magazines seem to be relatively well distributed and available to teachers in Carazo.

c) Training Guides

Training guides can be focused on several aspects of environmental education, from training teachers to use environmental education in their classrooms to training park interpretive

guides to training community environmental leaders. GreenCOM, the environmental education and communication branch of USAID, is taking the lead in producing training guides for use in park interpretation in Nicaragua. The Peace Corps also worked in conjunction with MED to produce a teacher training guide to accompany the environmental education curriculum developed by MED. Working with individual teachers and departments (with funding and technical support from WWF), MAN developed a teacher guide, which was scheduled to be printed in the spring of 1998. The dissemination of the guide was intended to be accomplished through having teachers participate in workshops.

- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.TNG) (3.PICT; 3.PAM; 3.POST)
- Also, the training manuals being produced by GreenCOM in conjunction with the park system will help provide a framework for training of personnel and then will be tailored to each individual park. (VI, 2, 4) (4.TNG) (XX)
- An important thing to mention is that the labeling that is in these [Peace Corps] environmental guide books is indispensable—this is a book done with MED in Nicaragua. It actually lists all the activities and at what point they apply directly to the curriculum so the teacher can go through her book and mark what areas she has activities for. [Interviewer] Most of the teachers don’t have copies of this book, right? [Subject] No teachers have copies. [Interviewer] This is the one that the Peace Corps is trying to raise money to distribute? [Interviewer] This is the one that Peace Corps made. There are two of them—first through third and fourth through sixth. (VI, 4, 8) (4.TNG) (4.CUR; 6.\$)

The teacher survey did not directly ask about training guides provided to the teachers and none of the teachers mentioned training guides as provided under the “other” category.

d) Conference Proceedings

Conference proceedings were only mentioned as a resource by the representative of the environmental education office in MARENA as that office sponsors and organizes the national-level environmental education conferences. However, conference proceedings are resources that would be extremely useful for departmental-level environmental education leaders and decision makers. The conference proceedings from the national level environmental education meetings include lists of and contact numbers for meeting participants, transcriptions of the keynote speeches, overviews of the sessions, and proposed plans of action developed during the national

meetings. They are valuable resources that are not widely distributed beyond conference participants but could help to encourage networking and information exchange between environmental education leaders in the country.

- We had the second meeting in November 1997 and we have a memoria—proceedings—a document. And so you could have the [proceedings from the] first meeting and then the [proceedings from the] second meeting. (I, 6, 3) (4.CONF) (2.CONF)
- [MARENA has] a document that compiled all the suggestions and presentations [from the First National Environmental Education Conference] that I think Carazo should have a copy of this—Silvio Echaverry at MARENA probably has a copy. (I, 5, 6) (4.BIB) (XX)

e) Bibliographies

Bibliographies provide an easily-accessible list of resources available for teaching about certain subjects. A listing of environmental education resources available in Spanish, compiled through the University of Wisconsin-Stevens Point, was provided to several environmental education leaders on the national and departmental levels. The MED representative interviewed also mentioned having a bibliography of materials available.

- At the Ministry of Education level, they get some support as far as literature and illustrations and things of that sort and bibliographies—and there's some of it but [I think] it's not enough and [I think] that there's a lot of need to improve that. (I, 11, 4) (4.BIB) (4.CURR)
- [Interviewer] These are from where I work—the Wisconsin Center for Environmental Education—and they're all resources in Spanish. And a lot of them are free. Some of them, you have to pay a little bit but, if you explain, but I explained to them that I was ordering them for Carazo—a department in Nicaragua—so they sent them for free. (I, 5, 6) (3.BIB) (XX)

f) Audio-Visual Materials

Not many audio-visual (A/V) materials for teaching about the environment were thought to be available in Carazo. This could be in part because of the fact that not many schools or organizations own the equipment required to use A/V materials. Additionally, not many A/V resources have been produced in Spanish for a Nicaraguan audience as the cost of creating these materials is often prohibitively high. The only publicly-accessible place that was known to have the ability to show video tapes to a large audience was the Ecological Museum of Tropical Dry Forests, located in Diriamba. The museum has several videos on sea turtles nesting at

Chacocente and environmental issues facing the department such as deforestation, water contamination, and soil erosion.

- The videos that are shown [at the ecological museum] concern the environmental problems of the department such as the deterioration of the Rio Grande and about the [coffee plantations]. (IX, 14, 2) (4.VID) (XX)

Only 1 teacher out of 81 reported having access to videos; one teacher reported having access to filmstrips; and none reported that they had access to films or video cassettes.

2. Community Resources

Community resources include human resources such as local environmental experts, university specialists, natural resource professionals. Also included are centers of learning such as museums, community centers, or universities.

a) Environmental Experts, University Specialists, and Natural Resource Professionals

Carazo possesses a wealth of human resources for environmental education. Many environmental experts live in the three major towns of the department, Diriamba, Jinotepe, and San Marcos, and are available to provide technical support and act as guest speakers for educators in the department.

- Human resources are the 60+ people [GreenCOM has] trained in over 15 organizations. (VI, 2, 7) (4.EXP) (4.COM)
- MARENA has a number of specialists in about every area related to the environment or forestry. These specialists are almost always willing to give small talks on whatever the need calls for. (I, 8, 1) (4.EXP) (XX)
- As far as extensionist work in Carazo, we find that Ing. Silvio Echaverry is one of our best human resources. In the future, we hope that all delegates will be able to focus more of their time and energy in extension work and environmental education within the community. This can be accomplished as a lot of their policing duties are taken over by others. (I, 8, 2) (4.EXP) (XX)
- Four years ago [MINSAs] started training medical staff to reproduce what they had learned in the field of pesticides in educational materials. [We're] using them to change the values and customs of people in their use of pesticides. That's where [MINSAs] mainly focused . . . and over two or three years of the training they've come up with 30 to 40 types of resources over the indiscriminate use of poisons. (II, 22, 2) (4.EXP) (2.PEST)

Teacher survey participants recognized that there were human resources available to them for teaching about the environment, yet none of them mentioned making use of these resources when asked about how they had incorporated learning about the environment into their class(es). This could be because most people do not recognize local environmental experts or university specialists as being “resources” unless these types of human resources are specifically pointed out to them. Even though it does not appear that teachers have made extensive use of human resources available in their communities, 16% indicated that there were community members who could be resources for environmental education; 4% indicated having access to environmental experts who could serve as resources; and 1% indicated having access to university specialists who were environmental education resources.

b) Local Parks and Natural Areas

Carazo includes one major natural area, Chacocente National Wildlife Refuge, which encompasses 4,800 hectares and is one of only two national wildlife refuges in Nicaragua. Also located just outside of Carazo is Volcan Masaya National Park, which is 5,100 hectares and is considered Nicaragua’s premier national park. Carazo is near to several other natural areas (including the cloud forest atop Volcan Mombacho and the lush forests of the islands of Ometepe and Solentiname) and includes many hectares of coffee plantations, which also serve as unique habitat to native plants and animals.

However, when asked to name resources available for teaching about the environment in Carazo, surprisingly few interview subjects mentioned natural areas, parks, or preserves.

- Nicaragua’s protected areas are also a resource. In and around the Carazo area, we have Chacocente and Volcan Masaya. In other areas of Nicaragua, we have Si a Paz and Bosawas. You can find more information about these protected areas by talking to Orlando Valasquez or Roger Roman, respectively. (I, 8, 1) (4.NAT) (XX)
- Volcan Masaya is the exception in terms of resources available—they have more materials and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed (VI, 2, 7) (4.PARK) (4.POST; 4.NAT; 4.PAM)

On the contrary, the teachers seemed to be more aware of the natural resources available to them for teaching about the environment than were the interview subjects. In the teacher surveys, 41% of the teachers who answered this part of the survey (81 out of the 83 total)

mentioned having natural areas available as resources to teach about the environment; 37% mentioned local parks; and 12% mentioned school forests.

Whether the teachers actually use the natural areas available in Carazo is another factor. It is often difficult and expensive to secure transportation to these areas, some of which are extremely remote. The areas are, however, well-equipped to handle large numbers of school groups and would be ideal places for Carazo's students to experience environmental education programs first-hand.

- At Volcan Masaya, [the park rangers] see schools almost every day. Usual visitation rate per day is about 300 students although some days it is as high as 800. Some trips are pre-planned while others just show up—the cost is a bit higher for schools who show up when they're not on the schedule. [They] have a big schedule so it is rather well planned out which schools are coming on what days. [They're] pretty well set in the way they deal with school groups—the kids arrive and sit down for a 15 minute talk from a ranger about volcano ecology and the park. They then receive a guided tour through the visitors center with the ranger explaining a bit about each exhibit—quality varies with the ranger. Some are very good and know a lot about the park. If requested, [the students are] shown a 20 minute slide show about the park—pretty well done. Then [the students] go walk around the crater area or have a guided tour through the lava caves. (VI, 2, 6) (2.PK) (8.K; 8.12)
- However, [the high visitation rate at Volcan Masaya] is not typical. For example, in the Chacocente protected area, visits to protected area [are] only from local schools because there isn't much capacity for school groups—[there's] no real visitors center or formal school programs at most other parks/protected areas besides Volcan Masaya. (VI, 2, 6) (2.PK) (2.K12; 8.K; 8.12)

c) Centers of Learning

Carazo is fortunate to be the home of several centers of learning, including universities and a unique museum. The University of Mobile has a satellite campus in San Marcos and, while it does not have an environmental education program, it does have a strong marine biology program that could provide guest speakers and environmental specialists on marine issues. Additionally, UNA is working on developing an extension of the university located in Carazo, most likely based in Diriamba.

- [MARENA and Carazo's environmental education commission] is trying to get extension through UNA involved in area of EE so that they can transfer the education to the people who will benefit. (II, 1, 6) (15.K12) (XX)
- We're going to have an extension of the agricultural university [in Diriamba]. (II, 1, 11) (15.K12) (XX)

Another valuable community resource for environmental education in Carazo is the Ecological Museum of Tropical Dry Forests. The museum is located in Diriamba and provides interpretive programs to the general public as well as to local school groups. The facility houses exhibits featuring the ecology and environment of Carazo, focusing on the unique ecosystem of tropical dry forests that were originally found in the area of Carazo (although the majority of tropical dry forest lands have been deforested to clear space to support the area's rapidly expanding population).

- We made a mark for ourselves with the exhibit that allows the students to get to know the objectives of the museum. The students participate voluntarily. [It] explains the reasons why the museum stayed in this municipality. It asks the students to identify which are the principal environmental problems and where they come from and explains to them what the solutions can be and ultimately they learn to differentiate the different types of forests and their animal and plant species. (IX, 14, 2) (2.K12) (7.STU)
- It is for this reason that we are thinking about reorganizing this [museum] in the following manner: primarily delimiting the four climatic regions of Nicaragua. Later, categorizing the region of dry tropics that have as a study objective to introduce to us a little about the functioning the ecosystem. (IX, 14, 2) (4.MUS) (XX)

Another interesting aspect of the ecological museum is that the museum's leadership is considering plans, pending funding, to create a documentation center for environmentally-related resources.

- [Interviewer] What resources does the museum have available for teaching about the environment? [Subject] Really it doesn't have any, but in the [museum project's future] is a document center for which there already is money. We want financing for this third phase, which is the construction of this center. (IX, 14, 2) (4.GEN) (XX)

On the teacher survey, only 7% of the teachers responded that they had access to a museum (or museums) as an environmental education resource. Also, none of the teachers indicated that they had access to scientific models yet the museum is filled with scientific models demonstrating local watersheds, turtle nesting behaviors and habitats, nutrient cycling in tropical dry forests, and more.

3. Financial Resources and Collaborating Institutions

At the root of the success or failure of many environmental education programs is funding. Without funding, a wonderfully-conceived program cannot get off the ground, nor can

it be sustained. There are numerous sources of funding available in Carazo, some of which have already been supportive of environmental education programs and others which have not yet been tapped as sources of potential funding for environmental education.

Through the personal interviews, organizations who are currently providing (or have provided, in the past) funding for environmental education programs underway were identified. These organizations and agencies range from national level government to local level non-governmental entities.

Table 4-13: Environmental Education-Related Project Funders As Mentioned in Personal Interviews (Arranged Alphabetically)

Name of Organization or Agency	Type of Organization or Agency*	Programs Funded
ADECA (Carazo Development Agency)	Nicaraguan departmental non-governmental	reforestation; Ecological Museum of Tropical Dry Forests; ecological brigades
Canadian government or NGO	Foreign government or NGO*	environmental education department within MARENA
Danish government or NGO	Foreign government or non-governmental*	environmental education department within MARENA
European Union	Foreign government*	PROSESUR (organic agriculture and agroforestry)
Finnish government or NGO	Foreign government or non-governmental*	technical assistance projects; reforestation
German government or NGO	Foreign government or non-governmental*	reforestation (tree nurseries); environmental education in schools
Inter-American Bank of Development	International government*	POSAF (reforestation, agroforestry)
International Development Bank (or Bank of International Development)	International government*	POSAF (reforestation, agroforestry)
MAN	Nicaraguan non-governmental	environmental education curriculum and activity guide development; teacher training; interpretive training
MARENA	Nicaraguan national and departmental government	POSAF (reforestation, agroforestry); ecological brigades
Mayor's office	Municipal level government	ecological brigades; reforestation; solid waste management programs
MED	Nicaraguan national and departmental government	ecological brigades; curriculum guides

Nature Conservancy	Foreign non-governmental*	Bosawas (natural area in northern Nicaragua)
Peace Corps	Foreign government*	Provides resources for some environmental projects on which Peace Corps volunteers are working (volunteers must apply for this funding through a grant process)
POSAF	Nicaraguan national and departmental non-governmental	agroforestry (organic farming); silvopastoral (purchasing of better pasture land); agricultural producer incentives
Swedish government or NGO	Foreign government or non-governmental*	environmental education within MARENA; POSAF (reforestation, agroforestry)
USAID (GreenCOM)	Foreign government*	environmental education and communication projects; studies in national parks and protected areas; interpretive training in national parks and protected areas
World Bank	International government*	PROSESUR (organic agriculture and agroforestry)
World Wildlife Fund-US (Latin American/Caribbean Program)	Foreign non-governmental*	conservation and development programs, mainly on Nicaragua's east coast; also funding printing and distribution of MAN's environmental education curriculum guide

* Foreign government/non-governmental and international government/non-governmental are distinguished from each other as "foreign" denotes an organization or agency that is based in one particular country, such as the U.S. Agency for International Development (based in the United States and supported by U.S. financial resources). "International" denotes an organization that is made up of representatives and receives financial support from many countries (which may or may not include Nicaragua) such as the World Bank.

Another important aspect of the success or failure of environmental education programs are the collaborating institutions or agencies, some of which provide funding while others simply provide logistical support or name recognition.

Table 4-14: Collaborating Organizations or Agencies on Environmental Education Projects in Carazo as Mentioned in Personal Interviews (Arranged Alphabetically)*

Name of Organization or Agency	Type of Organization or Agency	Programs Supported
CECOTROPIC	Nicaraguan national and departmental non-governmental organization	participating in Carazo's environmental education commission; collaborating with MED to spread environmental education to communities with agroforestry projects, working with normal schools on teacher training in environmental education
Farmer to Farmer	Foreign non-governmental organization	technical assistance and education on agroforestry
FUNCOD	Nicaraguan national and departmental non-governmental organization	providing rural environmental education; organizing community members and teaching about environmental issues; interested in working with MED on formal environmental education in schools
MAN	Nicaraguan national and departmental non-governmental organization	providing rural environmental education; interested in working with MED on formal environmental education in schools; developing curriculum guide for environmental education with support from WWF; providing teacher workshops focusing on activities in curriculum guide
MARENA	Nicaraguan national and departmental government agency	promoting organization and coordination of departmental level environmental education commissions; working with Peace Corps volunteers; working with GreenCOM to provide interpretive training in national parks and protected areas; collaborating with MED to improve environmental education in schools; organization of

		ecological brigades
Mayor's offices	Municipal government (elected and appointed officials)	promoting reforestation projects; participating in departmental environmental education commissions; developing municipal waste management and collection programs
MED	Nicaraguan national and local government agency	passed requirement of 60 hours of ecological service work for high school seniors; assisted in development of Carazo's environmental education commission; supports Peace Corps environmental education in schools
Media	national and local level radio, television, newspaper	partnerships to improve environmental journalism
MINSA	Nicaraguan national and local government agency	supporter of and collaborator in 60 hours of ecological service requirement; working with MARENA to visit schools to talk about environmental and health issues; assisted in development of Carazo's environmental education commission; public education about health and environmental issues (such as water contamination); working with school health brigades
NAAEE	Foreign non-governmental organization (professional association)	providing environmental education resources through the TEEM project
Nature Conservancy	Foreign non-governmental organization	providing financial, technical, and human resources support in Bosawas (natural area in northern Nicaragua)
Peace Corps	Foreign government organization	working on reforestation; environmental education in schools; collaborating with MED and MARENA
POSAF	Nicaraguan national and departmental non-governmental organization	promoting agroforestry; working with Farmer to Farmer project; collaborating

		with MED to spread environmental education to communities with agroforestry projects
PROSESUR	Nicaraguan national and departmental non-governmental organization	working on rural development programs including organic agriculture, agroforestry, soil conservation, and water conservation
Rotary Club	International non-governmental organization	interested in supporting environmental education
UNA	National governmental university	participating in Carazo's environmental education commission; collaborations on international environmental research projects

* Note: Some of these organizations may be the same as included in Table 4-13, "Environmental Education Funders As Mentioned in Personal Interviews"; however, the organizations included in this table have not necessarily provided financial support for the projects and programs described.

As can be seen from this compiled list of resources, there are numerous organizations and agencies who have provided funding and support for environmental programs in Carazo and Nicaragua.

d) Nicaraguan National and Departmental Government Agencies

The government agencies that most frequently support environmental education efforts are MARENA, MED, and MINSA.

- Some of the activities [the ecological brigade is] involved in are quality education with the forest that was established there with the assistance of MARENA and some funds that were obtained by some organizations from Germany. (VII, 10, 2) (5.MAR) (5.GER; 2.TREE)
- [I haven't] obtained very much help [to fund the ecological brigade] from those organizations but [I haven't] gotten in touch with those organizations in order to see about the possibilities of obtaining some help and that is the reason that most of the help that [I get] comes from ADECA and MARENA and in part from the Ministry of Education. (VII, 10, 4) (5.MAR) (5.ADECA; 5.MED)
- [MARENA] worked hard last year with the Ministry of Education and right now we are, education and MARENA, are working on an assignment through a grant, and in order to push the environmental education at the Ministry of Education. And we have a lot of

frustration but the vice minister is very, very interested in this subject of environmental education. (I, 6, 5) (14.MED) (10.VERT)

- [Subject 1] Just the other day I was walking down the street and there was a Ministry of Health truck with loudspeakers broadcasting a message about not throwing your trash in the water supply—how that causes contamination and sickness. [Subject 2] Yes, the Ministry of Health is also involved with environmental education. They focus on health related environmental issues such as water quality and contamination. (VI, 2, 9-10) (14.MINSA) (XX)
- We have been trying to target people from different sectors to stand on the [municipal environmental education] commission to get an idea of what the needs are in El Rosario right now. For instance, people from the [health center] have concerns about the contaminated water that people are throwing in the streets and the mosquitoes that breed in it because they've seen a rise in the number of cases of diarrhea and dengue. (VI, 4, 2) (14.MINSA) (XX)

b) Municipal Level Government Offices

The municipal level government offices are represented by the mayor's offices, which seem to be actively involved in environmental and health issues within their communities.

- The [health center] works with the school's health brigade, and we formed an ecological brigade at the school so a lot of it is just the coordination of the activities between the groups represented on the commission: the [mayor's office], [health center], [municipal] police, and the brigades. (VI, 4, 3) (14.ALC) (2.BRIG; 14.MINSA)
- The way it stands right now on the itinerary, the ecological brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash [collection] is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (14.ALC) (2.COMP; 2.TRAS; 8.COMM; 8.12)

c) Nicaraguan Non-Governmental Organizations

There are numerous Nicaraguan non-governmental organizations that are working on environmental issues and environmental education. These organizations include MAN and FUNCOD, which are the traditional environmental NGOs in Nicaragua. Other newer groups are becoming involved in environmental issues in Carazo including POSAF, PROSESUR, ADECA, and CECOTROPIC. Non-governmental organizations often have substantial funding and can afford to have personnel who work specifically on education-related projects. Although some of the NGOs are not able to provide financial support, the majority of them do provide human resources and logistical support to various environmental projects throughout the department.

- I forgot to tell you about PROSESUR, another project ascribed to national program of rural development which has just established offices in Jinotepe. [They] will work in Rivas, Carazo, and parts of Managua; [PROSESUR has] emphasized that they will work in agroforestry and organic agriculture and soil and water conservation. They have a lot of money—being financed by the European Union, Inter-American Bank of Development, and World Bank. [The] technical committee of POSAF at the Carazo level is integrated by MARENA, by the technician of POSAF, two representatives of two municipalities and one representative from this project [PROSESUR]. (II, 1, 9) (14.PROS) (XX)
- Some of these NGOs like FUNCOD and MAN are trying to get information out to these rural people. (II, 1, 5) (14.MAN) (XX)
- Some agreements have been agreed on between MARENA and MED but they seem to be being revised. They haven't been put out the public yet but [I'm] expecting that pretty soon the sphere of this agreement will be known to the public so that they can make good use of it. Most of the supporting institutions and organizations that have cooperated with MED have been MARENA and FUNCOD. (I, 11, 4) (14.FUN) (14.MARENA; 14.MED)
- POSAF finances organizations to work with groups of producers within the following areas: agroforestry, in which we only finance organic farming—nothing with chemicals. In silvopastoral, we give financing to better pasture land but not to buy more cattle. POSAF provides a 30 to 60 percent incentive to the producer, depending on their case. (II, 7, 1) (5.POS) (2.TEC)
- Like, you could say ADECA has been effective because they have gotten money to do things in environmental work. (VI, 3, 6) (5.ADE) (XX)

d) Foreign Government Agencies and Organizations

Various foreign governments have international development agencies (AID) that help fund infrastructure projects in Central America. In Nicaragua, the strongest forces present in this capacity include USAID; and Swedish, Finnish, Danish, Canadian, and German AID agencies. An important component of many AID agency projects is technical assistance programs, often focusing on environmental issues. These governments usually have paid staff members who work in Nicaragua for one year to several years implementing the projects designated by the agency through providing financial as well as human resource support for the environmental programs.

- [I have] even obtained some financing from Germany which allowed [the ecological brigade] to reactivate the [tree] nursery [I] was talking about. They got some money and when the students from Germany come here, they also help planting trees and doing some other activities related to environmental education issues. (VII, 10, 3) (5.GER) (XX)

- So, [environmental education in MARENA] was a big direction with Swedish support. The time that you're talking about [late 1980s], the environmental education was a unique direction and it had Swedish support. (I, 6, 1) (5.SWE) (XX)
- The Danish had Canadians as technical assistants for the finance and technical management [of the environmental education department in MARENA]—I'm not sure if you understand that kind of organization. The Danish contract the Canadians who are the ones that technically finance and manage all the things. (I, 6, 2) (5.SWE) (5.CAN)
- I know that, in San Salvador, [U.S.] AID is financing a big project and this project is like a [coordination] that makes everybody do things at the same time. But they have financed it for \$2 million during four years, and they're working hard with the brigadistas, they're working with the schools, they have a lot of materials that they already have done. But we don't have that here in Nicaragua. (I, 6, 5) (5.AID) (6.\$)
- This [ecological] museum project was carried out by the Association for the Development of Carazo (ADECA) with financing for the first phase from the Canadian government through the environmental fund. The second phase, which is in progress now, is being funded by the Crensem state (Germany). (IX, 14, 1) (5.CAN) (5.ADE, 5.GER)

e) Foreign Non-governmental Organizations

Interestingly, there is not an extremely large contingency of foreign non-governmental organizations active in environmental education in Carazo and Nicaragua. Several organizations were named in the personal interviews and several others were mentioned in some of the documentary review sources or pamphlets found by the researcher. Foreign NGOs that are working on environmental issues in Nicaragua and were mentioned in the interviews include: Farmer to Farmer; the Nature Conservancy; and NAAEE. Not mentioned in the interviews but mentioned in the documentary sources reviewed were: World Wildlife Fund and Wisconsin/Nicaragua Partners (a branch of Partners of the Americas).

- NAAEE is going to bring book packages for environmental education already translated into Spanish. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (3.CURR) (3.TEXT)
- The Nature Conservancy is involved in Bosawas [a protected area in northern Nicaragua]. (VI, 2, 8) (14.NAT) (XX)
- There are some organizations, like the one we just mentioned, Farmer to Farmer where some more information, some other educational material could be obtained and [I would] be more that happy to get in touch with these other organizations, whatever is possible, in order to be able to obtain that kind of material and also to get a better coordination at national level because a lot of efforts are duplicated because a lot of organizations are working by

themselves and probably if we coordinated actions a more efficient type of work will be done. (I, 11, 4) (14.FTF) (6.COMM)

Wisconsin/Nicaragua Partners (WNP) is part of Partners of the Americas, an international private non-profit organization. WNP maintains two offices, a northern one (located in Stevens Point, Wisconsin, USA) and a southern one (located in Managua, Nicaragua). WNP provided partial funding for this study and, in addition to funding and supporting environmentally-related projects, also supports numerous health-related activities, such as the Child Survival Project.

The work of World Wildlife Fund in Nicaragua is described in a WWF brochure as:

The WWF Program in Central America works together with Nicaraguan organizations . . . to improve local capacity to secure the best use and conservation of the country's natural resources, particularly in the northeast region of Nicaragua. Examples of the work being developed are: Conservation and Development in the Kukalaya and Layasika watersheds; Management and Conservation of the Miskito Coast and Keys Reserve.

(World Wildlife Fund, Central America Regional Office, n.d.)

WWF is funding and supporting other programs around Nicaragua and Central America using the following strategies:

- Protected areas
- Sustainable development
- Species of special interest
- Consumption and contamination
- Environmental education and development of local and national conservation capacity

(World Wildlife Fund, Central America Regional Office, n.d.)

Additionally, WWF financially and technically supported MAN in developing an environmental education curriculum guide for Nicaragua. The guide is written so that it can be adapted to fit the local environmental situation in each part of the country.

f) International Governmental Organizations

There are several international governmental organizations or agencies who are funding or have funded environmental and environmental education projects in Nicaragua and Carazo.

These organizations have governmental-level support from various foreign, national governments. International governmental organizations mentioned in the personal interviews include: World Bank, Bank of International Development, and the Inter-American Bank of Development.

- [POSAF] is a five year project sponsored by BID (International Development Bank), the government of Sweden, Nordic funds, and the government of Nicaragua. (II, 7, 1) (5.BID) (5.SWE)
- If we implement these projects with an environmental education program parallel to it, our chances to reduce these illegal activities [such as cutting of trees, poisoning of rivers for fishing, and so on] are getting better; one of these projects is called the POSAF, Proyecto Social Ambientale y Forestale (Social, Environmental, and Forestry in Development Project) financed by the Inter-American Bank of Development to promote agroforestry. (II, 1, 5) (5.IAB) (XX)
- [PROSESUR is] being financed by the Inter-American Bank of Development and the World Bank. (II, 1, 9) (5.IAB) (5.WB)

D. Summary of Results Relating to Subproblem Three: Resources Available for Environmental Education in Carazo

The data in this section will be presented in the following manner:

1. Description of Environmental Education Programs Currently Underway
 - a) Formal Education Programs (K-12 and University)
 - b) Teacher Training Programs
 - c) Campaigns and Parades
 - d) Government Sponsored Programs and Initiatives
 - e) Technical Assistance Programs
 - f) Issue-focused Technical Assistance Programs
 - g) Environmental Education and Interpretation Programs in Natural Areas of Carazo
2. Successes of and Problems with Environmental Education Programs Currently Underway in Carazo
 - a) Successes of Programs Currently Underway
 - b) Problems with Programs Currently Underway

Carazo possesses numerous resources for environmental education—from printed materials to human resources to funding opportunities. Through this study, information was gathered from diverse sources and brought together for analysis. Interestingly, none of the individuals interviewed were able to offer a comprehensive, or even extensive, listing of all of the resources available; nor were any of the interview subjects able to suggest one central place where information on printed materials, human resources, and funding sources could be

researched. Because of this lack of a centrally-located list of resources and sharing of knowledge, many of the resources available in Carazo have not been put to full use.

1. Printed and Audio-Visual Materials

Printed and audio-visual materials available in Carazo include: posters, brochures, picture books, training guides, conference proceedings, bibliographies, and video cassettes. These materials are available through government agencies such as MED and MARENA, through local natural areas and national parks such as Volcan Masaya National Park, and through international governmental organizations and NGOs such as the Peace Corps and GreenCOM.

2. Community Resources

Community resources available in Carazo include: local parks and natural areas; environmental experts and university specialists; and centers of learning, such as natural and protected areas, museums, and universities.

Local parks and natural areas in Carazo include the Chacocente National Wildlife Refuge, located on the western border of Carazo along the Pacific Ocean, and Volcan Masaya National Park, located just outside of the northeastern border of Carazo in the department of Masaya. Both of these nationally-designated areas offer ranger-led interpretive programs. Chacocente's programs are usually held in local schools (as the area is very difficult to access) while Volcan Masaya deals with numerous visiting school groups on a daily basis.

Environmental experts and university specialists abound in Carazo as it is located within commuting distance of Managua. The national level MARENA office has environmental specialists who are willing to be guest speakers to environmental organizations and in schools. Several universities are located in close proximity to Carazo, one of which is the National Agrarian University (UNA) where many professors and students specialize in environmental and natural resource topics.

Finally, Carazo houses the only museum in Central America that focuses on the unique ecosystem of tropical dry forests: the Ecological Museum of Tropical Dry forests located in Diriamba. This museum contains scientific models explaining various environmental issues and phenomena; offers interpretive programs for community members and school groups; has a video cassette player and several videos focusing specially on Carazo's unique environment and environmental problems faced by the department; and is in the process of raising funding to develop an environmental documentation center.

3. Financial Resources and Collaborating Institutions

Numerous national and international, governmental and non-governmental organizations support environmental activities in Carazo. These include national level agencies such as MED, MARENA, and MINSA; Nicaraguan NGOs such as MAN, FUNCOD, ADECA, and POSAF; foreign governmental international development agencies from countries such as the United States, Germany, Canada, Finland, and Denmark; and international funding organizations such as the World Bank, the Inter-American Development Bank, and the Bank of International Development.

IV. Summary of Results of This Study: Environmental Education Needs Assessment in the Carazo Department of Nicaragua

This study used personal interviews, teacher surveys, a review of documentary sources, and focus group results to address four subproblems: to identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations; to identify and describe the design and perceived success of environmental education programs currently underway in Carazo; to identify and describe existing resources (e.g. people, printed materials, protected areas, and so on) for environmental education in Carazo; and to recommend subsequent actions for use in the Carazo department based on the findings regarding environmental education needs, programs, and available resources. The results from the first three subproblems were presented in this chapter. (The results of subproblem four are addressed in Chapter Five, "Summary, Recommendations, Conclusions, and Implications.")

The needs determined through subproblem one of this study were three-fold: more environmental education teacher training; better dissemination of environmental education resources; and more programs that focus on Carazo's critical problems of deforestation, water contamination, solid waste management, and a lack of environmental sensitivity.

To address subproblem two, this study gathered information on various environmental education programs underway in Carazo. These programs included: K-12 formal education programs; teacher training programs; campaigns and parades; government-sponsored programs and initiatives; technical assistance programs; issue-focused technical assistance programs; and environmental education and interpretation programs in natural areas of Carazo. Several factors were described as being important components of successful environmental education programs. These were: involvement of students and teachers in environmental education programs;

involvement of local community members in environmental education programs; and involvement of government personnel in environmental education programs. Problems identified included: lack of knowledge, time, and interest on the part of project leaders; lack of sustainability of foreign or NGO supported programs; lack of funding for environmental education programs; lack of planning and coordination among organizations and agencies involved in environmental education; lack of government commitment to environmental education programs; lack of “real life” relevancy in environmental education programs; and lack of follow-through or evaluation of environmental education programs.

Subproblem three looked at the environmental education resources available in Carazo. It was determined that, while there are quite a few resources available for environmental education in Carazo, these resources are not well disseminated. It was also found that low-technology resources such as printed materials were easiest and most accessible for classroom teachers and community members. Community resources, including local environmental and university experts, local parks and natural areas, and centers of learning (such as universities and museums) were widely available in Carazo but not many people interviewed or surveyed were aware of these. Additionally, financial resources for environmental education programs are not overly abundant but they *do* exist. The problem with financial resources is that many local level leaders are not well informed about the resources available nor do they have the grant writing or project planning skills to successfully obtain and use the funding.

CHAPTER FIVE: SUMMARY, RECOMMENDATIONS, CONCLUSIONS, AND IMPLICATIONS

This chapter presents a summary of this study, along with conclusions, recommendations, and implications. The purpose of this study was to identify environmental education needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in the Carazo Department of Nicaragua. This chapter will present information on the conclusions, recommendations, and implications of the study in the following manner:

- I. Summary of the Study
 - A. Study Problems and Subproblems
 - B. Overview of the Results of the First Three Subproblems
 - 1. Subproblem One: Environmental Education Needs in the Carazo Department of Nicaragua
 - 2. Subproblem Two: Environmental Education Programs Currently Underway in the Carazo Department of Nicaragua
 - 3. Subproblem Three: Resources Available for Environmental Education in Carazo
- II. Subsequent Actions Recommended for Use in Light of the Results from the First Three Subproblems of this Study (Addressing Subproblem Four)
 - A. Recommendation One: Build on Existing Environmental Education Structures and Programs
 - B. Recommendation Two: Increase Environmental Education Networking in Carazo
 - C. Recommendation Three: Increase Locally-Empowering Environmental Education Programs
 - D. Summary of Recommended Actions
- IV. Further Recommendations for Use of the Study
 - A. Recommendations for Use of Study Results
 - B. Recommendations for Future Research
 - C. Recommendations for Future Needs Assessment Studies
- V. Conclusions and Implications

I. Summary of the Study

The purpose of this study was to identify environmental education needs, to compile information on current environmental education programs and available environmental education resources, and to recommend subsequent actions for use in the Carazo department of Nicaragua.

The researcher, with support from Wisconsin/Nicaragua Partners (WNP) and the Nicaraguan Ministry of Natural Resources and the Environment (MARENA), used personal

interviews, teacher surveys, a review of documentary sources, and focus group results to address the study problem. The study data were collected over a one month period in 1997 and a two week period in 1998.

A review of the related literature determined that an effective way to gather information on the environmental education needs, programs, and resources in Carazo was to follow a methodology developed for a Rapid Assessment for Conservation Education (RACE) study conducted in Honduras. This methodology combined participatory rural appraisal and rapid rural appraisal techniques to provide a well-rounded picture of the environmental education events taking place in the study area. The combination of qualitative and quantitative methods provided triangulation for the study to increase validity and reliability of the data gathered.

During the study periods of August 1997 and January 1998, the researcher employed various methods to gather the information for the study. Personal interviews were conducted with national level officials from government and non-governmental organizations; local level officials from government and non-governmental organizations; and municipal level officials from government and non-governmental organizations. Also interviewed were representatives of foreign government and non-governmental organizations. Surveys were conducted with 83 teachers (approximately 8 percent of the total in the department). Documentary sources relating to environmental education in Nicaragua and environmental education in Carazo were reviewed and related to appropriate subproblems. Finally, data gathered through an environmental education focus group conducted in spring 1997 were used.

The results of the study were used to recommend subsequent actions to be taken by Carazo to improve and increase environmental education in the department. The results were analyzed and presented as broken down into the subproblem components of the study.

A. Study Problem and Subproblems

The main research problem of this study is to identify environmental education needs, to compile information on current environmental education programs and available resources, and to recommend subsequent actions for use in the Carazo department of Nicaragua.

The first subproblem is to identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-governmental organizations. Personal interviews, teacher surveys, a review of documentary sources, and a focus group were used to gather data pertinent to subproblem one.

The second subproblem is to identify and describe the design and perceived success of environmental education programs currently underway in Carazo. Personal interviews, teacher surveys, and a review of documentary sources were used to gather data pertinent to subproblem two.

The third subproblem is to identify and describe existing resources (e.g. people, printed materials, and protected areas) for environmental education in Carazo. Personal interviews and teacher surveys were used to gather data pertinent to subproblem three.

The fourth subproblem is to recommend subsequent actions for use in the Carazo department, based on the findings regarding environmental education needs, programs, and available resources. Data gathered and synthesized from the first three subproblems were used to address the fourth subproblem. Findings regarding subproblem four are included in this chapter, after a summary of the results from the first three subproblems is presented.

B. Overview of Results of the First Three Subproblems

1. The first subproblem is to identify environmental education needs within Carazo as indicated by teachers as well as employees of local and national government and non-government organizations.

All four data gathering methods used in this study provided information pertinent to subproblem one, environmental education needs within Carazo. Through the personal interviews, the researcher explored the interview subjects' ideas regarding the most critical environmental problems in Carazo that could be addressed through environmental education. The interview subjects were also asked about what they believed to be the greatest barriers to environmental education and the factors that would best increase the level of environmental education within the department.

Through surveys, teachers were asked what environmental problems they perceived to be the most critical ones that could be addressed through environmental education. They were also asked about what they believed to be the greatest barriers to environmental education in their class(es) and the factors that would best increase the level of teaching about the environment in their own class(es). In addition to the aforementioned questions, which closely mirror the interview questions, the teachers were asked to define environmental education in their own words, a question whose responses helped to indicate whether the perceived need for more training in environmental education was warranted as many teachers did not provide

answers that encompassed the critical components of environmental education (awareness, knowledge, attitudes/values, citizen action skills, and citizen action participation).

A review of documentary sources was used as a “check” against the information gathered through the personal interviews and teacher surveys. Included in the documentary source review were government documents (national, departmental, and municipal level), non-governmental organization documents, and unpublished meeting proceedings (national, departmental, and municipal level). Information relevant to subproblem one was assessed through looking for data on what environmental problems were highlighted as critical ones, what items were mentioned as being barriers to environmental education both nationally and on a departmental level, and what kinds of programs or factors seemed to enhance environmental education, once again nationally as well as departmentally.

The final data gathering source used with relation to subproblem one was a focus group conducted through the Carazo Environmental Education Commission in spring 1997. The results from this focus group were compared against the data gathered through the personal interviews, teacher surveys, and documentary source review. This focus group highlighted critical environmental problems facing Carazo, the causes and effects of the problems, and possible ways to address the problems.

The outcomes related to subproblem one from the data collection methods described indicated that the most critical environmental problems in Carazo that citizens want to see addressed through environmental education include deforestation, solid waste management, water contamination, and a lack of environmental sensitivity. The most frequently mentioned barriers to environmental education were: lack of funding; lack of time specifically dedicated to teaching environmental education; lack of coordination between organizations, agencies, and environmental education programs; and lack of adequate teacher training. The highlighted barriers indicate a need to address these issues within the department. According to the four data sources, the factors that would best increase environmental education include: increased and improved pre-service and in-service teacher training in environmental education; increased access to environmental education resources; and increased cooperation and communication between government agencies. An additional factor mentioned by the teachers and several interview subjects was time set aside during the school day specifically for teaching environmental education.

2. The second subproblem is to identify and describe the design and perceived success of environmental education programs currently underway in Carazo.

Three of the data gathering methods were used to address subproblem two, environmental education programs currently underway in Carazo. Personal interviews, teacher surveys, and a review of documentary sources provided significant amounts and depth of information relating to this subproblem.

The personal interviews were used to gather data on programs currently underway as interview subjects were asked about programs offered by their organization or other organizations of which they knew. The interview subjects were also asked about whether they believed the environmental education programs currently underway to be successful and what factors contributed to the programs' successes or failures. With relation to subproblem two, a final area probed through the personal interviews was sources of funding and support for environmental education programs.

Through the teacher surveys, information was gathered specifically on environmental teaching within the formal school system. Teachers were asked whether they include or have ever included teaching about the environment in their class(es). If they answered "yes," the teachers were asked to elaborate on the manner in which they had included teaching about the environment. They were also asked about training received in environmental education and the subject(s) and frequency of in-service training sessions.

The documentary sources reviewed provided insight into other programs offered throughout the department as well as on a national level. Programs that were mentioned which contained an environmental education component were noted as were the funding and supporting organization(s) of each program.

The supporting data gathered with relation to subproblem two indicated that there are numerous environmentally-related and environmental education programs underway in Carazo. The types of programs mentioned and documented included: formal education programs; teacher training programs; environmental education campaigns and parades; government sponsored programs; technical assistance and issue-focused programs; and environmental education and interpretation programs in natural areas. Frequently cited successes of programs underway focused on the inclusion of key stakeholders, such as students and teachers, local community members, and government personnel. Problems with Carazo's environmental education programs encompassed a variety of program management and design aspects including: lack of knowledge, time, and interest on the part of program leaders; lack of sustainability in foreign or

NGO supported programs; lack of funding and resources for environmental education programs; lack of planning and coordination among organizations and agencies involved in environmental education; lack of government commitment to environmental education; lack of “real life” relevancy in environmental education programs; and lack of follow through or evaluation of environmental education programs.

C. The third subproblem is to identify and describe existing resources (e.g. people, printed materials, and protected areas) for environmental education in Carazo.

Data were gathered with regard to subproblem three, existing resources for environmental education, through personal interviews and teacher surveys. Existing resources explored in this study included printed and audio-visual materials; human resources; funding sources; community resources; and natural areas.

In the personal interviews, subjects were asked to describe environmental education resources available *from* their organization or agency *to* other organizations or agencies. They were then asked about how an educator would obtain these resources. The interview subjects were also asked about environmental education resources available *to* their organization and about resources available through other organizations.

The teacher surveys contained a question in which teachers indicated resources available to them for teaching about the environment. (The entire teacher survey can be found in Appendix M.) The list of resources provided, based on Dixon (1998), included printed materials (such as magazines, textbooks, brochures, and posters); audio-visual materials (such as films, video cassettes, and audio cassettes); human resources (such as university specialists, community members, or environmental experts); and community resources (such as museums, school forests, and natural areas).

The data gathered with regard to subproblem three indicated that there were numerous resources available for environmental education in Carazo; however, these resources are not well distributed or publicized. For example, there was no central place in Carazo to learn about all of the financial, human, and printed material resources that were available. Rather, the researcher interviewed 23 subjects and surveyed 83 teachers to gather the information used to address this subproblem.

Environmental education resources available in Carazo fell into all of the aforementioned categories including financial resources (provided by various government and non-governmental organizations); printed materials (provided by various government and non-

governmental organizations); community resources (including a ecological museum and several natural areas such as a national park and national wildlife refuge); and human resources (including government specialists, university specialists, and technical assistance providers).

II. Subsequent Actions Recommended for Use in Light of the Results from the First Three Subproblems of this Study (Addressing Subproblem Four)

Through this study, information was gathered regarding environmental education needs in Carazo, environmental education programs currently underway in Carazo, and environmental education resources available in Carazo. The data gathered was intended to guide recommendations for actions that would improve and increase environmental education in Carazo. As Carazo's environmental education commission creates a departmental-level strategic action plan for environmental education in Carazo, it is important to take into account the information gathered through this study with regard to programs that are already in existence, the success levels of these programs, resources available, and the current patterns of dissemination of these resources.

Information to address the subproblems of the study was gathered through personal interviews, teacher surveys, a review of documentary sources, and compilation of focus group data. After compiling the results from each of these diverse data-collection methods, several recurring themes developed and it is upon these themes that the 3 general and 11 specific recommendations for subsequent action were made.

The general recommendations for subsequent action center around three main themes: increasing environmental education networking in Carazo, increasing locally-empowering environmental education programs, and building on existing structures for environmental education.

A. Recommendation One: Build on Existing Structures for Environmental Education

The recommendations for subsequent actions begin with several programs currently underway and structures already in place in Carazo. The reason for this is that actions building on what is already being done are more likely to be adopted by the target audience, the citizens of Carazo. If suggestions for actions remain within people's comfort zone and do not stray terribly far from actions already being performed, it is much easier to make lifestyle adjustments. In the case of this study, the recommendations presented to Carazo's environmental education

commission will incorporate programs that have already been documented as taking place in the department.

Research on selecting target conservation behaviors conducted by GreenCOM suggests collecting baseline data using a method as was employed in this needs assessment study. Based on the study results, recommendations can be made to select target behaviors and outcomes (in this case, to increase and improve environmental education in Carazo) that have specific, measurable, intermediate steps. These steps must begin with familiar, existing programs and structures. To quote Booth (1996), "Successful education and communication activities build on what people are already doing correctly, rewarding and shaping their behavior towards the next step. This also makes it more likely that the environmental program is promoting behaviors that are compatible with local culture and social norms." Because of this, the first set of recommendations for environmental education in Carazo is to work with and build on the existing structures and programs.

Additionally, another reason that the recommendations from this study begin with existing structures and programs is that it is easier to see the need for change in structures and programs already established and underway. Learning from existing programs and structures can function as a rudimentary form of evaluation as program participants can be observed, successful elements are evident, and areas requiring change are often the most obvious of all. Specific suggestions for improvement can be made based on the "track record" of existing structures and programs.

The programs and structures specifically highlighted in recommendation one are: the required 60 hours of ecological service work; ecological brigade programs; the development of collaborative partnerships; and the use of existing forums for community involvement.

1. Capitalize on the Required 60 Hours of Ecological Service Work

An incredible opportunity exists for environmental education in Carazo in the 60 required hours of ecological work. Restructuring of this program could address some of the most critical barriers to environmental education that were mentioned including of lack of time, lack of funding, and lack of government support. To capitalize on the MED requirement, the program leaders must be well-trained, there must be buy-in from local government officials, the work must be tailored to municipal-level environmental programs, and the students must be empowered and included in the project definition process.

At the time this study was conducted, multiple interview subjects expressed frustration with the current state of the ecological service program. These subjects felt that the program was not being fully utilized because, in most cases, the teachers simply did not know what to do with the students during this time. Because of lack of time and motivation, the teachers often ended up having the students pick up trash or paint the school stadium, without providing any real environmental education or following the notion of true ecological service.

To address these concerns, the first and most obvious suggestion would be to provide more teacher training on the use of the 60 hours. However, problems that arise with this suggestions are the lack of time and the minimal salary that the teachers receive. Because of these barriers, a more expensive but exponentially more effective way of providing staffing for the ecological service work would be to hire two people, on the departmental level, whose job it is to focus specifically on the 60 hours of ecological work. These people could be based out of the MED or MARENA offices and could possibly receive financial support through one of these two agencies. If no funding is available through these agencies, a proposal to a NGO, foreign or national, to fund these positions for a minimum of three years would help to, at least, get this new system off the ground.

The ecological service workers would be responsible for traveling to the 16 high schools in Carazo, possibly visiting each school once a week, to work with the teachers and students in developing realistic and meaningful programs to complete their 60 hours of ecological service. (The ecological service guide already developed by MARENA [see appendix N] would be a valuable tool in helping to define the scope of work for the service requirements.)

Multiple benefits would arise from this arrangement. First, since the ecological service workers would be traveling between schools, information on successes and problems experienced by each school could be shared. Second, the departmental "60 hours coordinators" could serve as a resource to help local schools find additional funding for programs as they would be tied in with MED or MARENA and have access to information on potential funding sources. Third, the workers could receive in-depth training through the national MED and MARENA offices, as well as environmental NGOs (Nicaraguan and foreign), on environmental education so that they would have a comprehensive understanding of the field and be able to suggest truly beneficial and realistically-achievable goals to their target schools for developing ecological service projects.

2. Restructure Ecological Brigade Programs

Ecological brigades, like the 60 hours of ecological service, are practically ubiquitous. They exist in almost every high school and in many elementary schools in Carazo (and around Nicaragua, for that matter). Ecological brigades represent a perfect forum to get more students and young people involved in the environment of their community—voluntarily.

Some of the most successful aspects of current ecological brigade programs in Nicaragua are campaigns and parades—bright, colorful, loud, fun, one-shot projects. The restructuring of ecological brigade projects should not quell what the brigades do best (campaigns and parades), but rather build on these as strengths. (Once again, building on existing programs helps make the intermediary steps to target behaviors [increased environmental education] occur more smoothly and ensures that the steps and actions fit into the existing culture.) Campaigns and parades can be used to “spread the word” about environmental efforts in the schools and may help students to become motivated to learn more about the environment. Additionally, these events are culturally-appropriate and can be used to educate the community and identify individuals who might be interested in becoming more involved with environmental issues.

Utilizing community members and community groups in conjunction with ecological brigades can provide a partial solution to the schools’ problems of lack of funding and lack of time on the part of the brigade leaders. Several communities have separate community brigades but the suggestion is to bring the community brigades together with the school brigades, once interest is raised through parades or campaigns, to ensure that the brigades can address needs and wants of the community. Additionally, the community may have sources of funding and leadership for the brigades that were not available or not known by the school.

3. Pursue Collaborative Partnerships and Use Existing Forums for Community Involvement

Several unexploited (or under-exploited) potentials for collaboration and funding exist in Carazo. To provide support for a topic such as environmental education, which may be relatively new to certain communities and lack extensive government support, groups and organizations that are already providing public education on related topics must be sought as partners.

Mentioned briefly in the Chapter Four’s review of existing environmental education programs in Carazo was the possible link with health education providers. In Carazo, many of the critical environmental problems being faced are root causes of many of the health problems.

Because of this natural connection, health educators provide a perfect opportunity for collaboration. MINSA has an extensive network of health educators who are trained in pesticide education. Environmental groups and leaders could work with these educators and others to teach the public more about solid waste management issues, water contamination issues, overpopulation and its effect on the environment, and other health/environmentally-related issues. Additionally, non-governmental organizations working in health, including UNESCO, Wisconsin-Nicaragua Partners (Child Survival Project), the International Red Cross, and others could be approached to work in partnership.

Not only do funding opportunities increase when organizations collaborate on projects, but technical information and expertise can be shared more easily as well. Often health care workers are thoroughly trained in rural appraisal and needs assessment methods as the health care field has worked for years to determine appropriate behaviors and to develop ways to encourage people to practice them. There is much that could be learned and shared through collaboration between these two sectors.

Other non-formal partnerships that could be pursued for environmental education include working with neighborhood, women's, and church groups through community education forums. Many towns in Carazo have informal networks such as these (most predominantly church groups) that often focus on social issues and community issues. In Diriamba, there is a "Casa de Cultura," or community center, where various community groups can hold meetings. The meetings usually focus discussions on community problems or events. Past meetings held at Diriamba's "Casa de Cultura" have included topics such as health problems or educational reform. Using open forums that are already available in the existing community structure, such as the example mentioned in Diriamba, in conjunction with support from community groups, discussions can be encouraged on environmental issues and plans-of-action can be developed. This type of event works by encouraging people to increase their environmental awareness and knowledge, strengthen their beliefs, and put their citizen action skills to use through the development of action plans and actual participation focusing on critical environmental issues.

4. Summary of Recommendation One: Build on Existing Structures for Environmental Education

Instead of "reinventing the wheel," it would be beneficial for Carazo to begin developing stronger environmental education in the department through functioning avenues and structures already available. The required 60 hours of ecological service and the ecological brigades

provide immense opportunities to high schools (and sometimes elementary schools and communities, in the case of ecological brigades) to improve upon already ubiquitous programs. These two programs could be more effectively used if leaders of the programs were better trained in the multi-faceted definition of environmental education and presented with options for the myriad of projects that could be worked on through these avenues. To improve these existing programs, suggestions were made to hire one to three people in the department to focus specifically on the further development of the 60 hours of ecological service requirements, and, if time allows, with ecological brigade projects. Also suggested were partnerships with community ecological brigades or organizations interested in supporting the work of the brigades.

Recommendations were also made for environmental educators to reach beyond the boundaries of traditional environmental education and to collaborate with other public education sectors to provide joint environmental education programs. Possible sectors and groups mentioned for partnerships included the health sector, women's groups, neighborhood groups, and church groups. It was also suggested that environmental educators use these non-traditional partnerships to "spread the word" about environmental problems in the communities through already-established public education and community discussion forums such as the "Casa de Cultura" or community center in Diriamba.

B. Recommendation Two: Increase Environmental Education Networking in Carazo

Through this study, it is apparent that there are a significant number of environmental education programs currently underway and resources available to support these and other environmental education programs. However, there is not a free exchange of information nor is there an established information flow regarding environmental education throughout the department. Because of this, several specific actions are recommended to increase networking and sharing of environmental education information within Carazo.

1. Better Distribution of Printed Material Resources through Centrally-Located Environmental Education Resource Center(s)

Printed material resources are available in Carazo through government agencies including MED, MARENA, and MINSA. These types of resources are also available through foreign government agencies, such as the Peace Corps and GreenCOM, and through non-governmental organizations, such as MAN. Each of the mentioned organizations or agencies has

developed either one or all of the following material types: posters, brochures, curriculum guides, textbooks, and training guides. The benefit of using printed materials to support environmental education in Carazo is that these low-technology alternatives are easy to use and do not require high-technology equipment which most schools or organizations in the department definitely do not have on site and to which most do not have access.

While these materials could be very useful in teaching about the environment, problems arise with dissemination of the materials as there is a lack of adequate funding or channels to distribute printed materials to teachers and other non-formal educators (such as park rangers, technical assistance providers, and museum educators). To address the problem of poor dissemination, the development of an environmental education resource center for Carazo is suggested.

Developing a "library" of environmental education curriculum materials provides educators with a central location where resources can be obtained. Currently, MARENA in Managua has some environmental education resources that are housed in its "Documentation Center." The problem with this, however, is that many teachers and non-formal educators do not have the time or funding to travel to Managua to use the documentation center. Additionally, MARENA's resources are not available to be checked out nor are there inexpensive photocopy options on site in the Documentation Center; therefore, the materials must be read and used on site and are not available for later use.

If there were to be a central location designated in Carazo for gathering environmental education resources, it would provide an opportunity for educators to access environmental education materials that could be used in classes and could provide inspiration for the educators. Ideally, if each town could eventually develop its own environmental education resource center, the local teachers and non-formal educators could have easy access to the materials. However, at the start, one resource center for the department would still provide more access than there is at present.

Ideal locations for environmental education resource centers include the mayor's office of each of the department's major towns (Diriamba, Jinotepe, San Marcos, and Santa Teresa), the MARENA departmental office, or the Ecological Museum. Another option for housing an environmental education resource center would be local high schools or universities, such as the extension of the UNA that will be opening in Diriamba.

The Ecological Museum already has, as part of its long-term strategy, a plan to include a documentation center in the back room of the museum, which currently is furnished with

glassed-in book shelves and audio-visual equipment. This documentation center would be the perfect starting place for a centrally-located environmental education resource library.

To provide the resources, there are local individuals and agencies (such as the MARENA departmental office) who already possess sizable collections of environmental education resources that could be donated to this documentation center. Additionally, a designated resource center manager could collect resources from MARENA, MED, and MINSA in Managua; interpretive materials from local parks such as Volcan Masaya National Park and Chacocente National Wildlife Refuge; and foreign governmental organizations and NGOs such as the Peace Corps, GreenCOM, The Nature Conservancy, and World Wildlife Fund.

One possible source of support for the creation of a documentation center such as this is through the Peace Corps. The Peace Corps has a large contingency of volunteers whose work focuses on environmental education. To enlist the help and sponsorship of a Peace Corps volunteer, a local level organization (government or NGO) must write a proposal to the in-country director asking for a volunteer to assist with a specific project. The proposal must include information on what kind of project the volunteer will be helping with, who the local counterpart will be, and plans for sustainable continuation of the project after the volunteer has completed her/his term of service (usually two years). A proposal could be written to the Peace Corps to invite participation of a volunteer to help local level personnel, such as the director of the Ecological Museum, develop and collect resources for a Carazo Environmental Education Resource Center.

An environmental education resource center for Carazo would be a solid step toward improving dissemination of environmental education materials in the department. It would provide a central place for teachers, non-formal educators, and environmental education leaders to learn more about the field, gain inspiration for projects and programs, and share information on successful programs around Nicaragua and the world.

2. Quarterly Newsletter to Provide Information on Environmental Education Programs Currently Underway in Carazo

Through this study, it was determined that there are numerous environmental education programs currently underway in Carazo. Some of them, such as the ecological brigades and the 60 hours of required ecological service, were programs of which various people, from national level environmental education leaders to local teachers, were aware. Others, such as the agroforestry projects of POSAF and PROSESUR, were new programs of which only a few

people knew and even those people had only vague ideas as to the scope and focus of the programs.

To avoid duplicating efforts and to improve opportunities for collaboration, an environmental education bulletin or newsletter specifically focused on Carazo would be beneficial. This publication would not need to be elaborate, but rather, could provide similar information to what has been presented in this report: charts outlining programs currently underway, program supporters, program funders, location of programs, program goals, and contact people for the programs.

A document similar to the one described was compiled by MARENA's environmental education staff. A questionnaire was distributed in each department and a document that highlighted environmental education programs by department was created. (See Appendix O for the document created for Carazo.) The document suggested would be similar to this but would be updated several times a year to ensure that current programs are included and defunct programs are removed from the listing. A benefit of developing a newsletter, based on the document that was already created, is that, as described earlier, it is beneficial for the newsletter to build on what local environmental education leaders are already doing and would reaffirm their efforts

A publication such as this could be a service of the departmental environmental education commission, as the members of the commission are leaders from the major communities in Carazo who have frequent contact with programs underway in their municipalities. Additionally, as the commission members represent various groups including governmental and non-governmental; local, national, foreign, and international; private sector; schools; and so on, they would have wide access to different kinds of programs offered around the department.

The newsletter, ideally, could be distributed to all schools in Carazo (a list that Carazo's MED department could provide); to all members of the environmental education commission; to potential and current project funders (such as the foreign governmental organization workers, ADECA, GreenCOM, IDB, World Bank, and so on); and to national level agencies involved with environmental education (MAN, MINSA, and MED). The newsletter could also be available for sale and on display at the Carazo environmental education resource center, as discussed in section V-A-1, Centrally-Located Environmental Resource Center(s).

A newsletter such as the one described could be developed with minimal funding possibly through ADECA. It would serve to share information regarding programs underway

and help to avoid duplication of efforts in the same areas while sharing information on programs that could be implemented in different parts of Carazo. It could be distributed several times a year to ensure that the information included was current (rather than producing a one-time paper, such as the one created by MARENA) and kept updated with new programs and programs that have ended. A newsletter would represent a tangible effort to coordinate environmental education efforts and demonstrate a departmental commitment to support of environmental education programs and projects.

3. Formation of Support Groups for Environmental Education Project Leaders

Sharing of printed resources and information through a departmental newsletter are simple and critical steps that can be taken to improve the amount and quality of environmental education in Carazo. However, another important aspect of sharing information is to have meetings of local-level leaders to share frustrations, successes, and ideas.

Most high schools and some elementary schools in Carazo have ecological brigades through which students can work on environmentally-related projects. The leaders of the brigades are teachers, most often science teachers, who develop ideas for their brigades to pursue. Although MARENA and MED try to support the brigade leaders financially and with human resources, the reality is often that there is not much support for these clubs so the leaders must creatively develop low budget, low time-intensive, and low human resource-intensive projects. If ecological brigade leaders from around the department were to come together twice a year to discuss their respective brigades, a strong network among leaders could be formed.

Along the same lines, each high school in Carazo has students who are working on their 60 hours of required ecological service. The leaders of these projects are often the same teachers as are working with the ecological brigades. In theory, the 60 hours program is supposed to be a coordinated effort between teachers, school administrators, local environmental education commission members, and local MED and MARENA representatives. Realistically, most of the burden of organizing these hours of service falls on the teachers at the individual schools. If these teachers were given a forum twice a year to share ideas, successes, and frustrations, they would then learn from each others' experiences and find support in other teachers who were sharing similar experiences.

Networking among project leaders is a program that would require minimal resources. (The major cost would be transportation and meals for one day to bring these teachers to a central location for the meeting, for example the Ecological Museum and the proposed

environmental education resource center.) This is a program that could perhaps be funded through MED and MARENA. MED could agree to provide this networking opportunity included as one day of the week of in-service training that is required at the beginning of each school year.

An opportunity for ecological brigade and 60 hour project leaders to network would help to raise these well-intended, but currently not truly successful, environmental education programs to another level. If project leaders could brainstorm and share information about their successful projects and talk about problems they have encountered, they would most likely leave the networking sessions refreshed, inspired, and ready to lead the students in environmental education programs that could truly make a difference in their respective communities.

4. Summary of Recommendation Two: Increased Environmental Education Networking in Carazo

As first steps to improving environmental education networking in Carazo, three low-technology, low cost options have been presented. The first is to consolidate environmental education materials into one centrally-located resource center. A suggested location is the Ecological Museum in Diriamba as it has already built the cost of a documentation center into its long-term strategic plan. Additional assistance for developing such a resource center could be sought through the Peace Corps.

The second recommended action to improve environmental education networking in Carazo is to create a quarterly newsletter to list information on programs currently underway in the department. The newsletter would not need to be lengthy but rather could serve as a jumping-off point for people to gather more information as to what is going on in the department with regard to environmental education. An ideal producer and supporter of this newsletter would be the department's environmental education commission as the members of the commission are intricately linked to and have extensive knowledge of programs underway in the department. The newsletter could be distributed to local and national-level environmental education leaders and decision-makers, schools, and non-formal educators. It could also be distributed through the proposed environmental education resource center. Possible funding for this project could be obtained through a proposal to ADECA or foreign governmental or non-governmental organizations operating in Carazo.

The third recommended action to improve environmental education networking in Carazo is to hold bi-annual networking meeting for ecological brigade leaders, as well as leaders

of the 60 hours of required ecological service projects. These meetings could be held during the week before school begins which is usually set aside for in-service training. The meetings would be relatively inexpensive as the only costs would be transportation and meals for the leaders, probably one from each of the 16 high schools in Carazo along with leaders from several elementary schools that have ecological brigades. Funding and support for this program could possibly be obtained through MED or MARENA.

If these three low cost options were implemented in Carazo, access to information regarding environmental education programs would be significantly improved. Simply through demonstrating dedicated support of environmental education in the department, people working in the field would feel more empowered as their ability to learn and discuss their work would be greatly enhanced.

B. Recommendation Three: Increase in Locally-Empowering Environmental Education Programs

Following information gathered through the teacher surveys and personal interviews, local empowerment of environmental educators and environmental education leaders is a crucial step toward increasing the level of environmental education in Carazo. In describing components of successful environmental education programs that are created using a participatory process, such as the one used in this needs assessment study, the first component described by Booth (1996) is empowerment of people to take action.

Empower people to take action: Many countries have implemented successful education and communication activities that have increased awareness of the need to protect and conserve natural resources. People are now ready for action, but they need and want to know what they can do that might make a difference. For example, during recent focus groups connected with an environmental awareness campaign in El Salvador, participants repeatedly said that they were concerned about the degradation of their environment but they didn't know what they could do to solve these problems. In response, communicators changed their strategy from an awareness campaign to a campaign promoting specific behaviors which urban and rural people could carry out to protect and conserve their natural resources.

Expressing a similar sentiment to that described above, in the surveys conducted teachers listed the number one barrier to environmental education as being lack of training. Additionally, many interview subjects expressed great frustration with lack of local counterparts and follow through on foreign or NGO supported projects. These issues can all be addressed

through increased empowerment of local educators and leaders. The following four actions are recommended to address the empowerment of key environmental education stakeholders.

1. Increased and Improved Teacher Training

Increased and improved teacher training is not a novel idea; however, it is a valid and popular one. Carazo's teachers expressed a high level of interest in environmental education and concern about the environmental problems facing the department. One hundred percent of the teachers surveyed thought it was important to teach about the environment. Ninety-five percent of the teachers surveyed said that they had included teaching about the environment in their class(es). However, only 35% reported that they had received training in environmental education, while 72% answered that more environmental education training was the factor that would most encourage them to include more teaching about the environment in their class(es). There seems to be a dedicated call for more environmental education training coming directly from the teachers.

Moreover, it is evident, through analysis of the definitions provided by Carazo's teachers, that more teacher training in environmental education is critical to help the teachers understand the comprehensive definition of environmental education. Although preservation and conservation are strong messages that should be incorporated into environmental teaching, it is also important to enhance people's awareness of the environment, encourage discovery of knowledge, help them develop personal attitudes and values toward nature, learn about key citizen action skills, and allow them to participate in personally meaningful environmentally-related citizen actions.

In the personal interviews, concern was voiced not only about the lack of training specifically in environmental topics but, more so, over the non-active teaching methodologies used in classrooms and taught in the Normale or teacher training schools. It was also reported that, while in-service training time is provided by MED at the beginning of each school year, the time provided is not necessarily well used and rarely does it include environmental education training.

In light of the data gathered, it is clear that more pre-service and in-service training in environmental education is needed. Collaborations between MED, MARENA, and MINSA could help to bring this need to the forefront and make increased and improved training a reality. If MED would agree to dedicate one day of the in-service week to environmental education, MARENA and MINSA, along with other groups including the Peace Corps, MAN, and

FUNCOD, could provide training on environmental topics and active methodologies. Another community resource that could be tapped would be to bring in local guest speakers such as environmental experts and university specialists.

Another important component of the training, beyond providing topical information and active methodology suggestions and demonstrations, would be to highlight local resources available to teachers for educating about the environment. In the teacher survey question regarding resources available, human resources and natural areas were purposely included as several of the choices as many people do not think of these items as being environmental education resources. By bringing in local guest speakers to the teacher training sessions and highlighting local natural areas, minds could be opened to the many ways that exist for teaching about the environment.

A final suggestion for specific content in teacher training programs would be to build on the required 60 hours of ecological service that is mandated by MED and supported by MARENA. Teachers have an incredible opportunity available to them to engage their students in truly meaningful environmental education, encompassing all of the five goals of environmental education (awareness, knowledge, attitudes, skills, and participation). Through the increased in-service and pre-service teacher training, teachers should be given specific instruction on utilizing this built-in opportunity in a meaningful manner. MARENA has put out a guide entitled, "Methodological Guide for Determining Priorities for Environmental Action for the Ecological Service of Secondary Students" (see appendix N for a copy of this guide), which includes clear suggestions as well as a checklist for developing ecological service projects. If a MARENA representative, or someone trained by the MARENA staff, could present teacher training sessions, both in-service and pre-service, elaborating on this document, the teachers would feel more empowered and more knowledgeable on this subject and, consequently, would make better use of these valuable 60 hours.

Teacher training is a critical step toward local empowerment of environmental educators. Though most teachers do not think of themselves as environmental educators per se, they have an extremely important role to play in teaching about the local environment and its problems. In Nicaragua, students are required to attend school through the age of 16 so teachers have a great influence over what and how young people learn. By empowering teachers to understand environmental problems and be enthusiastic about environmental solutions, a large part of the population can be reached and inspired.

2. Training of Trainers Programs

Another aspect of local empowerment is to train local individuals to be environmental education leaders and experts. As Nicaragua is a very centrally-operated country, with the seat of power resting in Managua, most leaders and experts are located in the capital city and do not have daily contact with local-level citizens and events. Working through a "training of trainers" program, local level leaders can be trained by the national level environmental experts to then return to their communities and train others. This serves not only to decentralize the power and knowledge, but also allows the local leaders to have more access to local concerns and be able to network within communities to deal with environmental issues.

Training of trainers programs would begin with workshops, bringing together leaders in the environmental education field with people from Carazo who were interested in taking on leadership roles within their departmental-level environmental education community. Personnel from MED and MARENA's environmental education offices could offer this type of workshop at their headquarters in Managua and invite departmental-level leaders from around the country to attend. At the workshop, sessions could be presented on defining environmental education, exploring the five components of true environmental education (awareness, knowledge, attitudes/values, citizen action skills, and citizen action participation), successful environmental programs, pitfalls of environmental education programs, developing a local environmental education strategy, incorporating environmental education into the formal curriculum, organizing local environmental education commissions, and so on.

The people trained at this program would then serve as trainers in their respective departments. For example, the Carazo representative would agree to return to Carazo and offer a workshop to train local citizens in environmental education leadership. S/he would pass on the knowledge gained from the MED/MARENA program to empower more local people to act within the environmental education field. A specific audience that could benefit greatly from training of trainers programs would be the ecological brigade leaders. These people are self-selected as being interested in the environment and, consequently, would probably be wonderful candidates for receiving more training in environmental issues and knowledge that they could then spread to the community.

Funding for training of trainers programs could possibly be secured through international development agencies such as those from the United States (USAID), Canada, Germany, Finland, Denmark, and so on. If the programs were organized through the national level

MARENA and MED offices, additional support could probably be garnered from GreenCOM, Peace Corps, MAN, World Wildlife Fund, and FUNCOD.

Training of trainers programs help disseminate information from national-level, highly trained individuals to departmental-level individuals who then pass it on to local citizens to help them become involved in their local environmental issues. The program would require a substantial amount of funding up-front for the workshop and materials provided to the trainers but then, once the effort is looked at on a large scale, for the number of individuals who are eventually touched by the process, the amount of money spent per person affected is truly minimal.

3. Internship or Mentoring Programs

Taking advantage of the human resources already available in Carazo is key to empowering local people to take charge of their own environmental destiny. One enormous pool of human resources located in the department lies in the high schools. As each student is required to complete 60 hours of ecological service and many students are involved in ecological brigades, there is already an interested and somewhat committed audience of environmental educators on the horizon. Several interview subjects mentioned that getting young people more involved in community environmental issues would be one of the greatest factors to improve environmental education in the department.

- One of the factors that needs to be exploited the most is the student and young people population. Their numbers are the highest and with EE they can work to maintain the environment as it is and also work in these projects to better the town. (III, 17, 3) (11.YOU) (XX)
- [I've] been trying to explain to [the students and teachers] that environmental education is not just picking up garbage or planting a tree—it's working in your neighborhood and community or, he thinks it would be a good idea if secondary students would go into the primary schools and give little talks with the kids and doing activities with them . . . (V, 23, 4) (11.YOU) (XX)

Working with teachers and brigade leaders, outstanding students with a commitment to environmental issues and preservation could be identified for internships or mentorships. Internships and mentorships can enhance and build on a student's innate interest in the environment. Many students who are exposed to environmental work through their high school would probably be interested in pursuing this field either as a career or academic option. Furthermore, within various communities in Carazo, there are organizations and programs that

require additional staffing and human resources support. Outstanding high school students with a commitment to the environment could be identified to work with these programs.

In Nicaragua, many students do not work until they have terminated their academic career, whether that be at a high school or university level. To provide these students with an opportunity to gain professional experience through a volunteer internship or mentorship program would greatly enhance their career options and provide the organization with low-cost labor at the same time. Organizations who might be interested in participating in this type of program include: the Ecological Museum of Tropical Dry Forests, MAN, FUNCOD, and MARENA. Some of the students could even be "assigned" to stay at their high school and act as an assistant to the teacher who administers the ecological brigade or 60 hours of ecological service program.

The internship/mentorship program could be run as an academic contest, with incentives being some sort of scholarship or stipend provided to the students chosen to work as interns. Possible funders for this project could be Wisconsin/Nicaragua Partners, FUNCOD, or MAN.

An internship or mentorship program would build local capacity for environmental education by taking advantage of local people who have demonstrated an early interest in and concern for environmental issues. By training young people early, they are more likely to incorporate environmental values into their daily lives and can work as spokespeople to their local communities to teach citizens about critical environmental problems.

4. Funding Workshops

Funding is one of the most critical factors in success (or failure) of environmental education programs. Some elaborate programs require extensive funding not only to get them off the ground but also to sustain them. On the other hand, some very low-intensity programs require only a small amount of funding at the beginning and then are self-sustaining for many years. Either way, funding is a crucial element to allow organizations and agencies to take the first steps toward implementing environmental education programs.

During the personal interviews, lack of funding was mentioned as a barrier many times. It was mentioned in relation to programs in development, programs currently underway, and programs that were no longer in existence. Many subjects did not mention any financial resources available, either through their own organizations or others, throughout the interviews. However, many *did* mention the lack thereof and how that had affected their organization's or other organization's ability to offer quality programs and resources.

A building block to local empowerment is to teach environmental education leaders where and how to obtain funding for projects. Because this is such an important aspect of successful programs, funding workshops could greatly enhance the amount and quality of environmental education in Carazo. The funding workshops should include two foci: who is offering funding and how to write proposals to get the funding.

To provide information on what organizations are providing funding, a simple chart such as the one provided in Table 4-13 of this document could be highlighted. This would give environmental education leaders an idea as to what organizations are out there and what kind(s) of programs they have traditionally funded. Additional research could be conducted to provide information about the amount of money given historically, the requirements of the grantee, and the application process.

Next, the environmental education leaders could be trained in the fundamental aspects of grant writing. This training should include project and evaluation design, budget preparation, and advisory committee development. A final and critical step to empowering local environmental education leaders through this type of workshop would be to create a network through which these people could continue to share ideas and successes. The information on funding successes and resources could be shared through the quarterly environmental education newsletter described earlier (in section IV-A-2, "Quarterly Newsletter to Provide Information on Environmental Education Programs Currently Underway").

By providing local-level environmental education leaders with information on where and how to gain funding for environmental education projects, the leaders will be empowered to support and sustain their own programs, rather than being left at the mercy of foreign aid agencies to give what funding they want when they want. Environmental education leaders can learn to be proactive rather than reactive, how to properly budget for projects, how to select program staff, and how to design sustainable environmental education programs.

Funding workshops would be moderately expensive as the costs would include transportation for the community-level environmental education leaders to a central location for the workshop. Additionally, experts with knowledge of grant writing and local funders would need to offer the workshop, although there would probably be numerous people who would be willing to donate their time to act in this capacity. Wisconsin/Nicaragua Partners would be a good contact organization to set up this type of workshop as their employees write numerous grants to fund projects. WNP also has many contacts in the United States who might be willing to come to Nicaragua to provide this type of training to local individuals.

Empowerment of local environmental education leaders through funding workshops would have a great impact on the quality and number of environmental education programs offered in Carazo. Learning project planning and grant writing skills would help improve the effectiveness of local programs and would help allow Carazo's citizens to better control their own financial destiny.

4. Summary of Recommendation Three: Increase in Locally-Empowering Environmental Education Programs

Several relatively simple and key steps can be undertaken to empower local level environmental education leaders and to train citizens in environmental education skills and knowledge. These steps require a departmental commitment to environmental education but can be implemented almost immediately through working in partnership with organizations and agencies that have critical skills and resources.

First, increased and improved teacher training is a need that was voiced by interview subjects and classroom teachers alike. Increased training in environmental issues and active methodologies will go a long way to empower classroom educators who have a profound affect on Carazo's young citizens. There is already time built in at the beginning of each school year for in-service teacher training. Part of this time could effectively be used for environmental education training, if MED would agree to dedicate one of the five days exclusively to environmental and active methodologies training. Organizations such as MARENA, FUNCOD, MAN, and the Peace Corps could help to design the training offered to teachers during this week.

Second, training of trainers programs are excellent ways to make a little bit of training go a long way. By offering a centrally-located training session (probably in Managua as it is easy for people to take public transportation to and from Managua) on environmental education for trainers, the multiplier effect could be used to train numerous leaders in environmental education on both the departmental and municipal levels. The sessions could include information on the five principles of environmental education, ideas for environmental education programs, ways to engage citizens in environmental issues, and much more. Possible supporters and funders for training of trainers programs include MARENA, MED, GreenCOM, and international development agencies.

A third way to empower local citizens is to encourage young people to become more deeply involved in environmental issues. Internship and mentorship programs allowing high school students to work with local organizations and agencies could provide wonderful

opportunities for outstanding students, identified by their teachers, to gain work experience and to learn more about the environmental field. Additionally, interns and mentees can help to provide increased staffing to programs and agencies that are short-staffed and need more hands-on help. Organizations and agencies that may be interested in supporting this kind of program include MED, the Ecological Museum of Tropical Dry Forests, MARENA, MAN, FUNCOD, and others.

Finally, when looking at the core problem experienced by many environmental education programs in Carazo, it often boils down to money. Training local environmental education leaders to identify potential funders and to write successful grant proposals empowers them to plan and obtain funding for locally-important projects. Offering funding workshops to provide leaders with information on funding would be one of the most successful ways to improve the quality and amount of environmental education in Carazo. An especially good organization to provide advice and to possibly support this kind of training would be Wisconsin/Nicaragua Partners.

D. Summary of Results Relating to Subproblem Four: Recommendation of Subsequent Actions Based on the Findings Regarding Environmental Education Needs, Programs, and Available Resources

The results of subproblem four, recommendation of subsequent actions based on the findings regarding environmental education needs, programs, and available resources, indicated that there are numerous environmental education programs and resources in Carazo, but that the networking and sharing of information regarding these is not adequate. Additionally, the results indicate that there is a critical need for more empowerment of local-level individuals to provide environmental education to Carazo's citizens.

The needs determined through subproblem one of this study were three-fold: more environmental education teacher training; better dissemination of environmental education resources; and more programs that focus on Carazo's critical problems of deforestation, water contamination, solid waste management, and a lack of environmental sensitivity. Subsequent actions recommended to address these needs included: more environmental education networking within the department and ideas for further empowerment of local-level environmental education providers, including classroom teachers.

With regard to subproblem two, programs currently underway in Carazo, it was found that while there are numerous environmental education programs in operation, many of them are experiencing similar barriers. These barriers include lack of coordination and communication

both within the projects and between organizations/agencies supporting the projects; lack of funding for the programs; and lack of local counterparts for foreign or NGO projects.

Subsequent actions recommended to address these problems were to: pursue collaborative partnerships with health and community organizations to increase access to funding; increase the level of networking within the department through the production of a quarterly newsletter and through the creation of a central environmental education resources center; increase the effectiveness of the ecological service requirement through hiring one to three individuals to work throughout the department with students and teachers; and increase the effectiveness of ecological brigades through partnerships with community brigades and community environmental education leaders. Also recommended were programs to empower local environmental education leaders to build their capacity to act as successful counterparts for foreign or NGO sponsored projects.

Subproblem three looked at the environmental education resources available in Carazo. It was determined that, while there are quite a few resources available for environmental education in Carazo, these resources are not well disseminated. It was also found that low-technology resources such as printed materials were easiest for and most accessible to classroom teachers and community members. The subsequent actions recommended to address the problem of dissemination of printed resources were to create an environmental education resource center in a central location in Carazo (and eventually to have centers such as this located in each major municipality within the department) where printed materials would be available to teachers and non-formal educators. To address the lack of knowledge about funding resources available for environmental education programs in Carazo, a recommended action was to offer funding workshops to local environmental education leaders to train them how to find funders for potential projects and how to write grants to obtain the needed funding. Finally, to encourage educators to take advantage of local resources such as environmental experts, universities and university specialists, and places such as the Ecological Museum, it was recommended that teacher training workshops include featured guest speakers from the local communities and that the training sessions highlight local natural areas and other resources that might otherwise be overlooked.

Subproblem four encompasses the data gathered to address the first three subproblems: environmental education needs in Carazo; programs currently underway; and resources available. The recommendations made through subproblem four were derived from information synthesized from the first three subproblems.

Low-cost, low technology, and relatively simple suggestions were made to address the environmental education needs of Carazo. These suggestions took into account the foci, success, and failures of environmental education programs currently underway. They also involved a realistic assessment of departmental resources. The recommendations focused in three basic areas: building on existing programs and structures in environmental education; increasing environmental education networking in the department; and increasing local empowerment for environmental education leaders.

To build on existing structures, recommendations included: strengthening the ecological service program through hiring one to three full-time coordinators for the department to work with various schools; involving community brigades and members in ecological brigade programs for added leadership and funding support; and to seek out new partnerships with health and community groups while using established public forums to discuss environmental issues.

To increase networking in Carazo, recommendations included: creation of an environmental education resource center; development and dissemination of a quarterly newsletter reporting on projects underway; and gatherings of support groups for ecological brigade and 60 hours of ecological work program leaders.

To provide more locally-empowering environmental education programs, recommendations included: increased and improved teacher training programs; training of trainers programs; internships and mentorships for outstanding high school students; and workshops to train local environmental education leaders how to plan programs and obtain funding.

III. Further Recommendations

A. Recommendations for Use of the Study Results

This study was intended to gather baseline data on the state of environmental education in Carazo. Additionally, it also is a tool to assist in formative evaluation for environmental education efforts in the department. The information provided on the needs, programs, and resources can best be used by the department's citizens to develop a strategic environmental education plan to serve as a guide. The plan developed by the Carazo Environmental Education Commission should take into account the findings of this study when deciding what kind of environmental education projects to pursue, and what kind of resources to develop and disseminate. According to the results of this study, the commission should develop a strategic plan that provides networking and leadership development on the departmental level. They

should build into the framework programs that focus on Carazo's critical problems of deforestation, solid waste management, water contamination, and environmental sensitivity. Additionally, the commission should support teacher training and networking efforts.

The results from this study can also be used as a tool in on-going evaluation in conjunction with the strategic environmental education plan, once it is developed. Over a period of years, the current data on environmental education needs, programs, and resources can be compared and contrasted with the information gathered through this study. This will provide a concrete measure to Carazo's environmental education commission of the significant differences made by programs implemented and resources provided.

B. Recommendations for Future Research

1. Use of Additional Data Collected

This study collected additional data that were not directly used in analyzing the subproblems presented. Most of the additional data were demographic in nature and served to provide the researcher with a context in which to place the rest of the information gathered through all four collection methods (interviews, surveys, documentary review, and focus groups). Future research could be conducted using the data gathered to look at either the personal interview study population or the teacher survey population more closely.

On the teacher surveys, information was gathered with regard to the number of years the subjects had been teaching; the highest level of education completed; the number of hours spent in the classroom teaching; the number of students per class; the number of assistants per class; and the subjects taught. (Unfortunately, information on the last four topics mentioned was only collected for half of the group because of technical difficulties with a fax machine which prevented the final page of the survey from being administered to the second half of the population.) Further research could be conducted looking at correlations between these demographic variables and amount of teaching about the environment included in their classes. Also, another interesting aspect of this would be to determine if there was a correlation between the amount of environmental education training or resources available and the number of hours and depth of teaching about the environment included in class(es).

With information gathered through the personal interviews, subjects were asked to describe their position with their organization/agency and to describe the work of their organization/agency. Case or in-depth studies of environmental education leaders on the national, departmental, and municipal levels would provide fascinating data as to what

influences motivated these leaders to become heavily involved in environmental issues in a country that is not terribly supportive of this field. The information gathered through these case and in-depth studies would allow isolation of the influential factors, and these factors could then be promoted through environmental training programs, both on a formal and non-formal level.

Another interesting study to perform using data gathered through this study would be to compare the statements interview subjects made about the work of their organization with information provided through that organization's printed materials and triangulate the data with information provided by other people in the field who work for other organizations/ agencies. From this type of study, information could be gleaned regarding the reliability of data gathered through the personal interviews or printed materials. This type of information could be useful in future investigations to help formulate methodologies that gather the most accurate, reliable, and valid data possible through subjective methods including personal interviews, surveys, and reviews of documentary sources.

Finally, the focus group study methodology could be more deeply explored in working with the Carazo Environmental Education Commission. One focus group was conducted in spring 1997, from which the data were used in this study, but further focus groups with this same population could yield interesting data. Perhaps the four subproblems of this study could be addressed in separate focus group sessions with Carazo's environmental education members. The synergy of such a multifaceted group, such as Carazo's departmental commission, would bring out, through further focus groups, rich answers that might add significantly to the information gathered through this study.

2. Further Studies in Same Study Area

To continue with studying environmental education in Carazo, two critical populations would be imperative to include: community members and students. This study focused on two influential populations, teachers and environmental education leaders, and they were able to provide comprehensive information on the intentions of environmental education programs, well-informed statements regarding environmental problems facing their area, and an extensive list of resources available for teaching about the environment. However, the other part of the environmental education equation, balancing out the teachers and policy makers, is the citizens or the learners. A study looking at attitudes, values, beliefs, and knowledge of students in Carazo would provide valuable information to supplement that gathered through this study. A similar study conducted with community members would also help to guide the development of

Carazo's strategic environmental education plan in a direction of which the citizens and students of the department are supportive.

Another suggestion for research in Carazo would be to further explore the attitudes, values, beliefs, and knowledge of Carazo's teachers, on a larger scale with more depth. In this study, less than 10% of Carazo's educators were surveyed, because of time and logistical constraints, owing to the fact that the teacher survey was only one part of a larger study. A study designed to focus exclusively on Carazo's teachers could utilize a quantitative instrument, similar to the one developed for this study, to survey a larger percentage of teachers. In addition, teacher and administrator interviews could be performed to identify critical factors in motivating teachers to include teaching about the environment in their classes. Another interesting facet of this would be to compare these motivations with factors found to motivate teachers in other parts of the world, such as Nicaragua's sister state through Partners of the Americas, Wisconsin.

C. Recommendations for Future Needs Assessment Studies

Needs assessment studies provide fast, reliable, and relatively accurate data to researchers. They combine methodology originally developed in the social sciences with more traditional quantitative techniques to allow for methodological triangulation, a process in which multiple methods are used to gather information on one problem. Through this study both qualitative and quantitative methods were used. Several suggestions can be made on the use of techniques such as surveys and interviews.

1. Qualitative Data Gathering Techniques

Two types of qualitative data gathering techniques were used in this study: open-ended personal interviews and open-ended questions on the teacher survey. With the open-ended personal interviews, questions were developed that would encourage survey subjects to speak freely about their organization/agency, the organization/agency's programs and resources, and the subject's personal concerns about environmental problems facing the department or Nicaragua as a whole. In reviewing the questions asked, it can be recommended that, if this study were to be repeated, the questions should draw more directly and specifically from the study's subproblems. The open-ended method used did provide for richness in data collection but made analysis an extremely lengthy and arduous task as a great deal of superfluous information was generated. To avoid having to sift through a large amount of extra data, interview questions should more strictly follow the problems set out for the study.

On the teacher's survey, the qualitative questions were appropriately designed when qualitative data were indeed what was sought. A suggestion with development of an instrument such as this would be to keep the qualitative questions to a minimum. If a test can be conducted with a sample group that allows this sample group to free associate and provide lengthy qualitative answers, these answers can then be pared down to several appropriate choices to present to the rest of the survey population in a quantitative format. As the quantitative format can more easily and quickly be analyzed through descriptive statistics, this type of data is often more appropriate for a medium to large sample size.

2. Quantitative Data Gathering Techniques

Quantitative data were gathered using the teacher survey. Once again, it is important for the researcher to thoroughly think through, before hand, what kind of data is sought from a particular instrument or even for a question within that instrument. Keeping the research problem firmly in mind, it can be determined whether quantitative or qualitative data can most thoroughly and accurately address the task at hand. With that said, it must be stressed again that some of the information derived on the teacher survey through qualitative questions could have been more easily obtained through quantitative questions as long as the choices given were developed from an original "free association test group." The question about the manner in which the educator had included teaching about the environment in her/his classroom, for example, could have easily been a quantitative question with answers provided such as, "As part of science class," "as part of social studies class," "as part of a reforestation project," "through including the environment as a topic in class discussions and essays," and so on.

Another important lesson learned (about which the researcher was forewarned!) was that, in quantitative questions with multiple choices, respondents should be asked to choose only one answer. In the question regarding factors that would most encourage increased teaching about the environment, for example, teachers were asked to mark their two top choices. When respondents have provided more than one answer, the statistical calculations, especially when using a program such as SPSS, become much more complicated. However, if the subject is asked to choose only one answer, the answers will naturally fall out in a similar ranking as if the researcher were to ask each person to mark two or three of their top answers. In summary, less is more, fewer is better.

IV. Conclusions and Implications

This study is unique in that it carefully takes into account local wants, needs, and resources in the creation of a set of simple, low-technology, easily implementable recommendations. The importance of including local citizens in this primary level of project planning and implementation cannot be stressed heavily enough. Monroe (1998) states that,

“Effective projects empower local communities and use their expertise. Projects succeed only with the will and the support of the people. There are a variety of ways to involve local communities in a project, including *assessing their situation and viewpoints, encouraging their suggestions, enabling them to make good decisions, and helping them to share in the program benefits.*” [emphasis added]

This needs assessment study helps Carazo’s citizens reassess the current state of environmental education in their department and reorient environmental education programs and resources along the lines of the citizens’ desires. It also helps warn program planners of potential pitfalls that have been experienced by other programs and allows them the opportunity to guard against these issues and problems, which can be addressed before implementing a new program. The successes outlined provide a model on which to base new programs and encourage program planners to take advantage of the full range of resources available.

Studies such as this needs assessment, steeped in participatory and rapid rural appraisal methods, are effective tools to gather much needed information on the state of environmental education while ensuring invaluable local buy-in. Indigenous knowledge is the richest of all and it is only through this local understanding and support that environmental education programs can penetrate all levels of society to bring about change in attitudes, values, knowledge, and, in the end, true participatory citizen action.

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APPENDICES

Appendix A

Members of the Carazo Environmental Education Commission (Comision Ambiental del Departamento de Carazo)

Name of Organization	Type of Organization, if known	Location of Organization
ALSAM	[not known]	San Marcos
Boy Scouts	Non-governmental	Jinotepe
CAPROSER	[not known]	Diriamba
Centro Ambiental (Environmental Center)	[not known]	Dolores
Cuerpo de Paz (Peace Corps)	Foreign Government Organization	El Rosario
Hermanamiento	[not known]	San Marcos
INATEC/Politecnico (Nicaraguan Technical College)	Public Technical School	Jinotepe
INPRUC	[not known]	La Paz
Instituto Alejandra Garcia Vado (Alejandro Garcia Vado School)	Public School	Jinotepe
Instituto Berito Salinas (Berito Salinas School)	Public School	Dolores
Instituto La Salle (La Salle School)	Public School	Diriamba
Instituto Nacional Diriangen (Diriagnen National School)	Public School	Diriamba
La Prensa (Newspaper)	Independent Media Organization	Managua
MARENA (Ministry of Natural Resources and the Environment)	Government Agency (National and Departmental)	Diriamba
Mayor of La Paz	Governmental (Municipal)	La Paz
Mayor, El Rosario	Governmental (Municipal)	El Rosario
Mayor, La Conquista	Governmental (Municipal)	La Conquista
Mayor, La Paz	Governmental (Municipal)	La Paz
MED (Ministry of Education)	Government Agency (Municipal)	Diriamba
MED (Ministry of Education)	Government Agency (Municipal)	San Marcos
MED (Ministry of Education)	Government Agency (Municipal)	El Rosario
MED (Ministry of Education)	Government Agency (Municipal)	Santa Teresa
MINSA (Ministry of Health)	Government Agency (Municipal)	San Marcos
MINSA (Ministry of Health)	Government Agency (Municipal)	San Marcos

Name of Organization, cont.	Type of Organization, if known, cont.	Location of Organization, cont.
MINSA, SILAIS (Ministry of Health)	Government (Municipal)	Jinotepe
NICAMBIENTAL	Non-governmental	Managua
Policia Nacional (National Police)	Government (Departmental)	Jinotepe
POSAF (Programa Socioambiental y de Desarrollo Forestal)	Non-governmental	Diriamba
PROSESUR	Non-governmental	Jinotepe
Radio Cepad	Independent Media Organization	Santa Teresa
Tierra y Vida (Land and Life)	Non-governmental	Santa Teresa/Conception

Appendix B

Environmental Education Objectives and Guiding Principles from the Tblisi Declaration

Environmental education should:

- Consider the environment in its totality—natural and built, technological and social (economic, political, technological, cultural-historical, moral, aesthetic);
- Be a continuous lifelong process, beginning at the preschool level and continuing through all formal and non-formal stages;
- Be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- Examine major environmental issues from local, national, regional, and international points of view so that students receive insights into environmental conditions in other geographical areas;
- Focus on current and potential environmental situations, while taking into account the historical perspective;
- Promote the value and necessity of local, national, and international cooperation in the prevention and solution of environmental problems;
- Explicitly consider environmental aspects in plans for development and growth;
- Enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- Relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- Help learners discover the symptoms and real causes of environmental problems;
- Emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
- Utilize diverse learning environments and a broad array of educational approaches for teaching/learning about and from the environment with due stress on practical activities and first-hand experience.

(UNESCO, 1982)

Appendix C

List of Schools as Provided by Carazo Ministry of Education, August 1997

Municipalities Included:

San Marcos

Diriamba

Dolores

Santa Teresa

La Conquista

Jinotepe

El Rosario

La Paz

GOBIERNO DE NICARAGUA
MINISTERIO DE EDUCACION
DIRECCION DEPARTAMENTAL CARAZO
AÑO ESCOLAR 1997

UNICIPIO: SAN MARCOS

NOMBRE DE CENTROS	COD	DEPENDENCIA												PROGRAMAS ATENDIDOS												SECU	
		AREA		TURNO		ESTATAL		MUNICIPAL		PREPAGO		ESPECIAL		BÁSICO		PRIMARIO		SECUNDARIO		EXTRAS		DIGNA		EDUC			
		A	B	M	V	MUT	NO MUT	COM	MUT	OTROS	NO SUPA	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F		
dro Joaquín Chamorro	1		X	X	X	X																					
dy Guzmán López	2	X					X														80	22					
ribel Molina	3	X		X			X							318	147												
muel Calero	4	X		X			X							54	29												
s A. Garcia	5		X	X	X	X								42	24	403	192										
blo Coroz	6		X	X	X	X								24	14	288	142										
omón de la Grava	7		X	X		X												41	20								
esel Angel Ortiz	8	X		X	X	X										459	222										
mando Rojas Zúñiga	9	X		X	X	X										968	500										
pública de Ocho	10	X		X	X	X										670	333										
itulo Juan XXIII	11	X		X	X	X																	1289	636			
rio Rivas	12		X	X	X	X								61	25	465	197	30	12								
itilo Laplante	13	X		X												140	82							44	23		
itulo El Pueblo	14	X				X																			312	139	
é Guevara	15		X	X	X		X	PC						30	11	90	42	68	28								
anque	16		X	X		X										26	16	60	34								
usto C. Sandino	17		X	X	X	X								35	20	422	220										
sillo	18		X	X			X											26	12								
én Darío	19		X		X	X	X	PC						37	19	144	57	31	12								
cepción de María	20		X	X	X	X								23	15	123	62	37	18								
1 Pedro de los Molinas	21		X	X		X		PC						28	13	122	57										
n San Bernabé	22		X	X	X	X								24	16	187	101						57	32			
ché de Agua	23		X	X			X	PC						2	13			33	12								
ito Rey	24	X		X										48	22	20	10										
esc. Los Conejos	25		X	X				PC						43	26												
iro Mercado	26	X		X				PC						30	13												

Elaborado por Derman Zapeda M.
Sección Estadística Deptal.
23 de Junio

NO: SAN MARCOS

CENTRO	ESTADISTAS	DEPENDENCIA											PROGRAMAS ATENDIDOS														
		ESTATA					PUBLICO						PRIVADO		PRIMARIA				SECUNDARIA								
		AREA	TURNO	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA	ESTATA
Los Pajaritos	32		X	X																							
Concepción de Ma	33		X	X																							
Las Ovejas	34	X		X																							
Covisama I Etap	35	X		X																							
Covisama II Etap	36	X		X																							
os			X	X																							
ara			X	X																							
Úñez			X	X																							
Spez			X	X																							
Herrera			X	X																							
320			X	X																							
Especial		X	X			X				113	53																
Centros 38		14	23	34	12	18	6	17		2	113	53	1122	670	4830	2424	326	148	80	22		1390	741	312	139		

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OK Actualizados

Elaborado por Derman Zepeca M.
Sección Estadística Deptal.
23 de Junio

Municipio Diriamba
Organización 1997

Municipio Diriamba

NOMBRE DE CENTROS	COD.	DEPENDENCIA											PROGRAMAS ATENDIDOS																	
		AREA				ESTATAL			PUBLICO		PRIVADOS		Espec.		Preesc.		PRIMARIA				SECUNDARIA									
		U	E	M	V	AUT	No A	Com	Mun.	Cepad	Subv	No Subv	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F		
El Tamarindo	43		x	x			x																							
Los Guerreros	45		x	x			x									73	42													
El Trapiche	47		x	x			x																							
Amayo	48		x	x			x																							
Amayito	49		x	x			x																							
Pedro J. Chamorro	50		x	x	x		x								38	17														
Los Gutiérrez	52		x	x			x																							
Huehuele	54		x	x			x								71	31														
Casares	55		x	x			x								234	109														
La Boquilla	56		x	x			x								89	47														
Sontole	57		x	x	x		x								25	13														
Río Limón	58		x	x			x																							
San Antonio de Arriba	59		x	x			x								68	29														
Rolando Pomarés Acevedo	61		x	x	x		x								25	9										126	62			
Apompá	62		x	x			x																							
Preesc. Roberto Clemente	64	x		x				PC							30	15														
Preesc. Carlos Méndez	68	x		x				PC							44	20														
CEDA							x																							
San Miguel del Guayacán	71		x	x			x								24	15	30	15												
Pedro Joaquín Chamorro	72		x	x			x		PC						35	19	265	140								100	42			
Los Baitodanos	73		x	x			x																							
Buena Vista del Sur	74		x	x	x		x								26	10	360	209								61	29			
Río Seco	75		x	x			x																							
El Tigre	76		x	x			x																							
Barranco Bayo	78		x	x			x																							
Santa Lucía	79		x	x			x	PC							15	5	40	19												
San Antonio de Abajo	80		x	x			x										30	10												
San Gregorio	81		x	x	x		x								68	30	638	324								131	66			
San Juan de la Sierra	82		x	x			x	PC							30	17	41	20												
Los Cumiches	83	x		x								x					31	13												
Preesc. Armando J. Suarez	86	x		x				PC							30	15														
Los Díaz	89		x	x			x																							

Sección Estadística Deptal.
Elaborado por Darman Zepeda M.
7/07/97 1:47 PM MATRIC97.XLS

GOBIERNO DE NICARAGUA
MINISTERIO DE EDUCACION
DIRECCION DEPARTAMENTAL CARAZO
AÑO ESCOLAR 1997

Municipio Santa Teresa

NOMBRE DE CERTIFICADOS	COD	AREA	TURNO	DEPENDENCIA										PROGRAMAS ATENDIDOS															
				ESTATAL					PUBLICO			PRIVADOS		Espec.		Proesc.		REGULAR		MULTIG.		NOCTURN		ESPECIAL		DIURNA		NO	
				L	R	M	V	ALT	No A	Com.	Mun.	Cepad.	Subv.	No Subv.	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS
Eugenio Ruiz Traña	1		X	X			X								24	14	19	11	27	13									
Elys Francisco Téllez	2		X	X	X		X										52	24	60	32									
Segundo Mercedes Morales	3		X	X			X								33	15	48	23	67	35									
César Lara Tercero	4		X	X	X		X								25	16	58	32	73	37									
Gerardo Benicio Herrera	6		X	X			X								21	12	100	49	21	12									
San Antonio	6		X	X	X		X								21	12	20	10	27	12									
Nevil Ramón Matus Traña	7		X	X	X		X								26	13			46	21									
Pedro J. Chamorro (Ochom)	8		X	X			X												27	12									
Otto Daniel Martínez Guiso	9		X	X			X								22	9	50	22	67	43									
Rubén Darío	10	X		X	X		X								168	88	736	363											
Inst. Hermanos Narváez	11	X		X	X	X	X																				755	399	2
Francisco López Cortez	12		X	X	X		X										44	18	70	39							41	24	
Félix Antonio Vega	14		X	X			X										24	11	24	13									
Pedro J. Chamorro (Calish)	15		X	X			X										27	9	35	15									
Marlon Martínez	16		X	X			X												41	15									
Guy Moquet	17		X	X	X		X								27	12	19	9	64	40									
Socorro Vargas Molina	18		X	X	X		X										17	7	43	24									
Carlos Ernesto Martínez	19		X	X			X										17	10	26	13									
José Martín Corrales Vanegas	20		X	X			X												23	9									
Rolando Cortez Téllez	21		X	X	X		X								33	20	121	58	24	14									
Oriando Ismael Narváez R	22		X	X			X										39	14	22	9									
Oscar Turcios Chavarría	23		X	X			X								27	13	183	94											
Carlos Cruz Navarrete	24		X	X	X		X								23	13	147	71									48	26	
César A. Calderón Flores	25		X	X			X												15	7									
Corazón de María	28	X		X								X			27	14	22	11											
San Francisco	31	X		X								X					74	34											

4 22 26 11

Elaborado por Derman Zepeda M.

4 de Julio 97

4:16 PM

Municipio: Jhotepe

Nombre del Centro	C.O.S.	DEPENDENCIA											PROGRAMAS ATENDIDOS																		
		ATA					PÚBLICO						PRESC.		SERVICIO		GENERAL				Mujeres		Otros								
		U	R	M	V	AUT	Inf.	Prim.	Secund.	Sup.	No. sup.	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F						
2-D: La Mascota	34	x		x										69	30																
Corazón de María	35	x		x										19	14	181	110														
Cristian Emmanuel	36	x		x										23	12	192	86														
Preescolar Cocito	37	x		x										60	32																
Roxicali	38	x		x										60	33	74	34														
Inst. Jorge Parales	40	x																								280					
CEDA Carlos Fonseca	41	x																		105	28										
Inst. Alfonso Urroz F. Martínez	43	x																						422	205						
21 de Febrero	45		x	x																											
La Cabecera	51		x	x																											
Inst. Flemingo Rivera Quintero	52	x																								183					
Rubén Darío	53		x	x																											
Preesc. San José	54		x	x																											
Preesc. Niños de B. Alén	56	x		x																											
Preesc. Las Ovejitas	58	x		x																											
Bautista	59	x		x																											
Jane Uruña Bona	55	x		x																											
Colegio Rubén Darío	60	x		x																											
Esc. Normal Ricardo M.	61	x		x	x																										
Colegio Génesis	70	x		x																											
Preesc. Los Conejos	71	x		x																											
Preesc. El Jardín	72		x	x																											
Preesc. Los Peñitos No 1	73		x	x																											
Preesc. Los Peñitos No 2	74		x	x																											
Jardín Infanticoral	75	x		x																											
El Ingenio	76		x	x																											
Las Ovejitas	77		x	x																											
Preescolar Aragón	78		x	x																											
Peñitos No 3	79	x		x																											
Las Ardillitas	80		x	x																											
Maísol	81	x		x																											
Las Mariposas	82		x	x																											
Educación Especial	83	x	x											83	30																
Total centros (82)		36	21	57	11	7	22	13					5	16	90	31	1284	647	5778	2693	500	242	105	28	293	128	3459	1850	702	317	638

36 21 57 11 7+23+13+ 5 + 16
 92 02

7+22+13+5+16 = 62-2 (doble dato) = 62

Elaborado por Derman Zapata M
 Sección Estadística Deptal.

OK
 Actualizado

**GOBIERNO DE NICARAGUA
MINISTERIO DE EDUCACION
DIRECCION DEPARTAMENTAL CARAZO
AÑO ESCOLAR 1997**

Municipio El Rosario

N.º	CENTRO ESCOLAR	AREA	TIPO	ESTADO	DISTRITO	MUNICIPIO	SECTOR	ASISTENTES		TOTAL	NIVEL DE ESTUDIOS				TOTAL
								ASISTENTES	FOLIOS		PRE-PRIMARIA	PRIMARIA	SECUNDARIA	TERTIARIA	
1	Cañas Blancas MO-2	X	X	X	X	X	X	19	11	68	35				
2	Franco Martínez	X	X	X	X	X	X	23	7	48	19	62	33		
3	Arten Sá Bermúdez	X	X	X	X	X	X	68	40	495	252		151	01	
4	Bertha Díaz	X	X	X	X	X	X	21	16	34	14	48	15		
5	Rigoberto López Pérez	X	X	X	X	X	X	20	9						
6	Angéles del Rosario	X	X	X	X	X	X	#	83	688	345	163	58		
7	Total Centros (6)	2	4	6	2	1	4							151	01

OK. (Fotografía)

Elaborado por Deymar Zapedia M.
3-4 de Julio
3:45 PM

GOBIERNO DE NICARAGUA
MINISTERIO DE EDUCACION

AÑO ESCOLAR 1997

Municipio La Paz

NOMBRE DE CENTRO	DEPENDENCIA											PROGRAMAS ATENDIDOS																		
	AREA		TURNO		ESTATAL		PÚBLICO			PRIVADOS		Espec.		Preesc.		REGULAR		MULTI		NOCTURNO		TRAE		DIURNA		NOCTURNA		AD		
	CODE	U	M	V	NO	NO	Com	SP	Comal	Ind	Subv.	AS	E	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS	F	AS		
San Pedro	1		X	X										25	12	59	29	78	43											
Angelita Morales Arlés	2	X		X	X	X								93	44	540	276													
St. Jonathán González	4	X		X		X																		290	134					
Antiego Sevilla	5		X	X			X											37	13											
San Diego	6		X	X			X											44	15											
San Juan Bernabé	7		X	X	X									31	9	124	58	23	8											
Centro Femenino (CEFE R)	9		X	X	X																		107	41						
Preesc. Arco Iris	10		X	X				PC						23	13															
Acuanioche			X	X				PC						25	8															
Total Centros (9)		2	7	9	3	2	4	2		1				197	66	723	363	182	78				107	41	290	134				

C = Preescolar Comunal

OK. Actualizados

Elaborado por Dermun Zepeda M.
3-4 de Junio 1997
3:51 PM



Appendix D

Letter of Introduction for the Study from Carazo Ministry of Education

GOBIERNO DE NICARAGUA

DELEGACION DEPARTAMENTAL CARAZO

Jinotepe, 2 de Diciembre 1997

A : DIRECTORES DE CENTROS DE ESTUDIOS
PROFESORES

Sirva la presente para presentar a los Señores : VONDA BROWN y CLODOLDO LOPEZ de la Universidad de Wisconsin Centro de Educación Ambiental, ellos visitan sus Centros de Estudios con el fin de pasar o aplicar encuestas sobre "Educación Ambiental", los Centros son los que a continuación detallo :

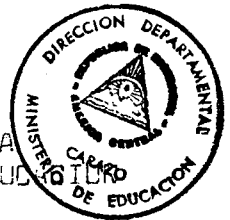
- 19 de Julio Diriamba *Rosa M. Paiz* - Esc. Rubén Darío (Atrás Mercado)
- San Antonio Jinotepe *Barbara*
- Mario Rioux San Marcos *Rosa M. Paiz* - Esc. Jesús de Nazareth
- La Ronquita Diriamba *Rosa M. Paiz*
- El Madroño La Conquista *Rosa M. Paiz*
- Cañas Blancas El Rosario *Rosa M. Paiz*
- Luis A. García San Marcos *Rosa M. Paiz*
- Inst. Jonathán González La Paz de Carazo *Rosa M. Paiz*
- Pedro Joaquín Chamorro Diriamba *Rosa M. Paiz* Metros del Cementerio
- Arlen Siú Bermúdez El Rosario *Rosa M. Paiz*
- Corazón de María Sta. Teresa *Rosa M. Paiz*

Esperando brinden todo el apoyo necesario por los Señores antes mencionados.

Les Saludo.

Atentamente,

Ada Fajny V. Siquez Zepeda
LIC. ADA FAJNY V. SIQUEZ ZEPEDA
DELEGADA DEPARTAMENTAL DE EDUCACION
CARAZO.-



c.c./ archivo.
AFVZ/ brpg.

Appendix E-1

Pre-Interview and Interview Documents: List of Appointments to Schedule for Interviews

Meeting Schedule for Nicole Ardoin
August 18 - September 5

Days available for meetings:

Monday through Saturday

August 18 - 23

This is the week I'm planning to spend in Managua conducting interviews and focus groups (with FUNCOD and MAN).

Monday through Saturday

August 25 - 30

This is the week I'm planning to spend in Carazo (Diriamba) conducting interviews and teacher focus groups.

Monday through Saturday

September 1 - 6

This week will be used to finish things and complete interviews which haven't been scheduled yet. May also conduct some focus groups here. Split time between Carazo and Managua.

Please try to arrange meetings with these people during the week of August 18 - 23.

People/organizations with whom I would like to meet:

Vicky Belli, Environmental Education Specialist, MARENA -- **Any day during this week is fine.*

If there are other people involved in EE in MARENA, I could meet with them as well.

Extension Agents, Extension Division of MARENA -- **Any day during this week is fine.*

No specific contacts here but someone who works with agricultural or natural resource related extension projects. Would like to find out about publications available, on-going programs, projects being pursued through this branch of MARENA.

Juan Jose Monteil, EE Project Specialists, FUNCOD -- **Early in the week (for interviews) such as Monday, Aug. 18 or Tuesday, Aug. 19 preferably. Focus group: late in the week such as Thursday, Friday or Saturday.*

In addition to the interview, I would like to conduct a focus group (5-7 people) with this organization sometime on Thursday, Friday or Saturday. If you could see if they would be able to do that, I'd appreciate it. We'll need a conference room with a table where everyone can sit around it. Could you see if they would have that available in their office?

Director, Environmental Education Specialist, Community Outreach Specialist, MAN -- ** Early in the week such as Monday, Aug. 18 or Tuesday, Aug. 19 preferably. Focus group: late in the week such as Thursday, Friday, or Saturday.*

No specific contacts here but someone who is familiar with their environmental education efforts and programs. Someone with whom I can arrange for a focus group probably toward the end of the first week.

Contact at the Ministry of Education -- ** Later in the week (such as Thursday or Friday) would be fine.*

I don't have any specific contacts here but someone who knows about the following areas would be helpful: curriculum planning and design; general structure of the Nicaraguan educational system; knows about laws and regulations governing both public and private schools.

Professor or Community Outreach personnel at UNA -- ** Later in the week (such as Wednesday, Thursday or Friday) would be fine.*

Someone who may be involved in environmental education, science education, community education, or anything along those lines (probably someone in the College of Natural Resources). Additionally, any information on training courses offered on environmental education or to teachers would be interesting.

Country Director or Previous Contact (made by Sherin) Peace Corps -- *Tuesday or Wednesday, preferably.

Nina Chambers, US AID (Managua) -- I will arrange for this meeting upon my arrival as she is out of town until Aug. 16.

Rob Whipple, University of Idaho (Managua) -- I will arrange for this meeting through Nina Chambers.

Appendix E-2
Pre-Interview and Interview Documents: Fax Sent to Interview Participants

August 1997

Dear _____ :

Thank you for agreeing to meet with me on _____ at _____. I appreciate you taking time to work on this valuable environmental education effort.

I wanted to explain a bit more about the research I am conducting so that you may be better prepared for our meeting.

The importance of and need for environmental education has been rapidly increasing as natural resources continue to be depleted at a breathtaking rate. A clean and healthy environment is critical our physical as well as emotional well-being. Environmental education is an expanding field which can join diverse people through knowledge not only about the environment as a whole but more importantly knowledge specifically centered in their own community.

In order to support an effective environmental education (EE) movement, more information is needed on what kinds of programs and resources are already available. Working through MARENA, the Carazo Department has volunteered to be the first focus area of this environmental education study as it already has several mechanisms in place for promoting EE programming through formal and non-formal venues. However, Carazo requires more concise information on the resources available and needs of its citizens with regard to this topic. This will be examined through a local as well as national perspective.

A study called "Rapid Assessment for Environmental Education" (RAEE) began in July 1997 to address these topics. RAEE will compile a comprehensive report on the current state of EE using a combination of procedures including personal interviews and focus groups. A researcher from the Wisconsin Center for Environmental Education is working closely with the Ministry of Natural Resources and the Environment (MARENA) and Wisconsin-Nicaragua Partners (WNP) to perform this assessment.

You are part of the interview section of the research. Information gathered from you regarding your organization's interest and efforts in environmental education as well as resources available will be extremely helpful in determining the current support structure for environmental education.

A list of questions will be sent or faxed to you several days before your interview. Please read over these carefully as they will help you to prepare and allow you to provide thorough information to the interviewer.

If you have any questions or need to change the scheduled interview time, please contact Henry Rios at the Companeros Nicaragua - Wisconsin at _____. He can be faxed at _____ or reached by e-mail at nelson@ibw.com.ni.

Once again, thank you very much for taking part in this study. Your time and effort are greatly appreciated.

Sincerely yours,

Nicole Ardoin
Environmental Education Specialist
Wisconsin Center for Environmental Education

Appendix E-3
Sample Interview Questions

Sample Questions Provided from Interviews with:

Silvio Echaverry, MARENA (English version)
Indiana Fuentes, MAN (English and Spanish versions)

Appendix E-3

Pre-Interview and Interview Documents: Sample Interview Questions

INTERVIEW WITH SILVIO ECHAVERRY

Carazo MARENA Delegate

June 30, 1997, 7:00 PM

Interviewer: Nicole Ardoin, Wisconsin Center for Environmental Education

This interview will provide information to be used in compiling an environmental education (EE) needs assessment study for the Carazo department of Nicaragua. The research team is gathering information from a variety of sources in order to:

- determine environmental problems of particular concern to this area.
- determine environmental education needs in Carazo.
- identify specific participants in and target audiences for environmental education programming.
- review existing environmental education programs and evaluate achievement of their objectives.
- determine strategies for incorporating environmental education into formal and non-formal educational system for both youth and adults.

Through participating in this research process, you will assist in providing accurate, thorough and helpful information which will be used in creating an EE framework for Carazo. Thank you for your time and interest in this project.

Please review the following sentences carefully as questions similar to these will be asked during your interview. The order may vary and some questions may be omitted depending upon time constraints or the thoroughness of your answers. If you have any questions or concerns, the researcher can answer them before the formal interview begins. Please allow approximately 1 to 2 hours for this interview. Thank you.

1. Would you please provide me with some background information regarding your position with MARENA?
 - What are your major responsibilities?
 - What functions does your office perform?
 - How many staff members do you have?
 - What are their specialties?
2. What do you perceive to be the need for environmental education (EE) in Carazo?
 - Which environmental issues do you think are especially important and why?
3. What environmental education programs are currently in place in the Carazo department?
 - Which of these are MARENA programs?
 - Which are programs of other agencies/organizations and supported by MARENA?
 - Which other agencies or organizations besides MARENA are active in EE in Carazo?
 - What kind of support is provided by your office for the programs?
 - How successful do you perceive these programs to be?
4. What resources (monetary, training, printed materials, staff assistance, etc.) is your MARENA office able to provide to support EE in Carazo?
5. What organizations do you perceive to be possible funding and support sources for future environmental education endeavors in Carazo?

**INTERVIEW WITH INDIANA FUENTES
MAN
(Movimiento Ambientalista Nicaragense)**

August 20, 1997
Interviewer: Nicole Ardoin

This interview will provide information to be used in compiling an environmental education (EE) needs assessment study for the Carazo department of Nicaragua. The research team is gathering information from a variety of sources in order to:

- determine environmental problems of particular concern the Carazo region.
- determine environmental education needs in Carazo.
- identify specific participants in and target audiences for environmental education programming.
- compile information on environmental education resources currently available in Carazo.
- review existing environmental education programs and evaluate achievement of their objectives.
- determine strategies for incorporating environmental education into formal and non-formal educational system for both youth and adults.

Through participating in this research process, you will assist in providing accurate, thorough and helpful information which will be used in creating an EE framework for Carazo. Thank you for your time and interest in this project.

Please review the following sentences carefully as questions similar to these will be asked during your interview. The order may vary and some questions may be omitted depending upon time constraints or the thoroughness of your answers. Please allow approximately 1 to 2 hours for this interview. Thank you.

- 1) Which environmental issues do you perceive to be especially crucial ones to address through environmental education?
- 2) What environmental education efforts are currently under way through MAN? Please describe the program participants / target audience.
- 3) What staffing within MAN is dedicated to environmental education? (Please include both part and full-time.)
- 4) What do you perceive to be the greatest barriers to environmental education in Nicaragua?
- 5) What kind of environmental education resources (books, magazines, videos, posters, brochures, etc.) are available through MAN?
- 6) What kind of support does MAN offer to departmental environmental education programs? (Please include training of teachers, workshops, printed materials, EE specialist assistance, monetary support, etc.)
- 7) What other organizations do you perceive to be supportive of environmental education in Nicaragua? (Please include businesses, non-profits, citizen groups, universities, etc.)
- 8) Is there anything else you would like to add about which I haven't asked you?

**ENTREVISTA CON INDIANA FUENTES
MAN
(Movimiento Ambientalista Nicaraguense)
20 de Agosto, 1997
Entrevistadora: Nicole Ardoin**

Esta entrevista dará información para la construcción de un estudio de necesidades en educación ambiental en el departamento de Carazo, Nicaragua. El equipo investigativo esta colectando información de diversos fuentes para:

- determinar los problemas ambientales de más importancia para Carazo.
- determinar las necesidades para educación ambiental en Carazo.
- identificar los participantes específicos y el público para la programación de la educación ambiental.
- compilar información sobre los recursos recientes disponibles en Carazo para educación ambiental.
- revisar los programas que existen sobre educación ambiental y evaluar los logros de sus objetivos.
- determinar estrategias para la involucración de educación ambiental en los sistemas formales e informales para jóvenes y adultos.

A través de su participación en el proceso de investigación, Ud. ayudará a dar información precisa, completa y útil que será importante en la creación de una armazón de educación ambiental para Carazo. Muchas gracias por su tiempo e interés en este proyecto.

Por favor revisar las siguientes preguntas, preguntas similares se harán durante su entrevista. Posiblemente el orden variará y algunas preguntas omitirá dependiendo en el transcurso del tiempo y lo concienzudo de sus respuestas. Por favor permitir aproximadamente 1 a 2 horas para esta entrevista. Gracias.

1. ¿Cuáles problemas ambientales percibe Ud que son especialmente críticos y pueden estar solucionado con educación ambiental (E.A.)?
2. ¿Qué tipos de esfuerzos está haciendo MAN en educación ambiental (E.A)? Por favor describa los programas, participantes y público meta?
3. ¿Cuántas personas en MAN están dedicados a educación ambiental? (Por favor incluir personal parcial y jornada.)
4. ¿Cuáles, percibe Ud., son las barreras más grandes para educación ambiental en Nicaragua?
5. ¿Qué tipos de recursos sobre E.A. (libros, revistas, videos, afiches, folletos, etc.) están disponibles a través de MAN?
6. ¿Qué tipo de apoyo ofrece MAN a los programas departamentales sobre E.A.? (Por favor incluir educación de los profesores, talleres, materiales escritos, especialistas en educación ambiental, apoyo monetario, etc.)
7. ¿Cuáles otros organismos percibe Ud. apoyan E.A. en Nicaragua? (Por favor incluir empresas, ONGs, grupos de ciudadanos, universidades, etc.)
8. ¿Hay otras cosas o información que le gustaría agregar?

Appendix F-1
Post-Interview Documents: Transcription of Interview in English

**NOTES FROM INTERVIEW WITH [INTERVIEW SUBJECT'S NAME]
[SUBJECT'S POSITION, ORGANIZATION/AGENCY]
[WORK LOCATION OF INTERVIEW SUBJECT]**

August 28, 1997

Interviewer: Nicole Ardoin

Wisconsin Center for Environmental Education, University of Wisconsin

Please read over the following notes carefully. Although this is not an exact transcription of your interview, it condenses the information you provided. Make any changes or corrections directly on the notes. Please feel free to add any additional information in areas where you think your answers may be unclear or misleading.

After you have made any changes to the interview notes, please sign the following statement in order to give the researcher permission to use information gathered from you in the final report on environmental education in Carazo.

The researcher requests permission to use whatever part of the interview that might provide data for the study and permission to include it in the final publication(s).

I have read and edited the following interview notes. I give my permission to the interviewer to use the information for the aforementioned purposes.

(Interview Subject's Name)

(Date)

**** When finished, please return the signed notes in the following manner:**

Before Sept. 5, 1997

- Fax to: Nicole Ardoin, Companeros Nicaragua-Wisconsin, 505-266-2426
- Questions: Call 505-266-8038 or E-mail coniwis@ibw.org.ni

After Sept. 5, 1997

- Fax to: Nicole Ardoin, Wisconsin Center for Environmental Education, 715-346-4698
- Send to: Nicole Ardoin, Environmental Education Specialist
Wisconsin Center for Environmental Education
403 Learning Resources Center, University of Wisconsin
Stevens Point, WI 54481 USA
- Questions: Call 715-346-4320 or E-mail nardo166@uwsp.edu

("R" signifies interviewer/researcher, Nicole Ardoin. "I" signifies interview subject.)

R: What do you consider to be the most critical environmental problems in Carazo that can be addressed through environmental education (EE)?

I: Agriculture appears to be the cause of all environmental problems in that it leads to overpopulation. Agriculture traps us into a system in which we have sufficient food supply for the current population. This population reproduces and greater food resources are required. In order to feed the increasing population, clearcutting and other techniques such as fertilizers and pesticides must be implemented to increase production and in turn population once again. I understand that educators can't go running around teaching that agriculture is the cause of environmental problems, but perhaps the idea can be addressed and discussions and experiments could focus on how to resolve the problem and if it really is a problem. A promotion of the importance of a return to diversity in nature and food sources should definitely be addressed.

Number two problem, it's garbage—contaminated water, soils, plastic bags in the streets

R: I was wondering if you could describe your position [with your organization, a foreign governmental agency]—talk about what kind of schools you work with, how many schools you work with, what sort of things you do with them, and what kind of involvement you have with the teachers and students at those schools.

I: I work with 2 rural schools—they're barrios or small communities right outside of Jinotepe. I work with 4th through 6th grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. The people whom I work with are very active and interested in their community. Another volunteer lives across the road from me and she has a lot more problems—I think because her school is larger and teachers aren't that interested in working—they're not as involved with the community and with the students' lives.

R: What kind of involvement do you have with the teachers and students and what kind of projects do you do with them?

I: Right now some of the teachers and I are planning different environmental themes and activities that we will address for the remaining months of this semester. We're using ideas from Peace Corps manuals from previous volunteers from Guatemala and Panama. Currently, we're working on an overpopulation analysis for the community. We're splitting the kids up into groups so that they can go around and ask questions such as, "How many people live in this house? How many people have died in a certain amount of years? How much firewood and water do you use per day?" etc. We're going to make a population growth rate chart. A separate group is going around and asking about the resources -- how much land is there, how much water is there, how much water does the community use per year. Then we will discuss how much longer we can continue at the current population growth rate. This was one of the teachers ideas which is a positive thing, but she probably wouldn't have undertaken a project like this on her own. Perhaps, however, it will be a good experience and will encourage her to initiate similar projects in the future.

R: What sort of issues do you focus on—you mentioned overpopulation—is that kind of your focus right now? You said you do different units with the teachers . . .

I: We're trying to get together themes like garbage, deforestation, overpopulation, an introduction to environmental science, ecosystems, animals, different appreciations for environmental problems—and coming up with different projects—mostly outside of the classroom—going for walks, thinking about the adaptations of different animals and plants. Then we're going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade—so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas.

R: It sounds as if you've been really successful—I've talked with other [people who work for your organization] and it seems as if you've had the most success so far.

I: I don't work with many teachers—I only have 4 teachers I'm working with but I'm learning my Spanish, learning to work better with them, learning what the kids learn best from and what gets them thinking.

R: Do you do this during the school hours or do you do this after school hours. Is there time during the day for your activities?

I: To talk with the teachers?

R: For your projects, is that done during regular class time?

I: There's an hour that they have—I think it's called "Accion Civica." It's an hour that they have twice a week—they're supposed to work for their community but the schools don't really do anything—it's kind of like a play time. So, we use that time and we use the science class time. I plan with the teachers outside of class—at night or after school I go over to their houses.

R: Most of the teachers, is that when they do their planning? Do they have time during the day at all or is most of it done at home, outside of school?

I: They have an hour during the day. I work with one teacher during that hour and with the others at different times in the evening or morning when they have time.

R: For classroom teachers in Carazo, including the ones you work with as well as the ones that don't seem to be that interested in EE, what do you perceive to be the greatest barriers to teaching EE in the classroom?

I: I think the way that people teach here—I know that there is a school called the "Normale" where all the teachers go and then they do a one or two year internship in different parts of Nicaragua. However, the training doesn't seem to help because many teachers just talk *at* the kids and the students don't pay attention. There's not enough hands on activities or labs. I don't think you need a lot of resources to think of a lab or experiment. You may need a few materials but it's not very expensive and you can find things within the community to do activities. I don't think money is the big problem—I think it's just ideas and the way their teaching is here. Some teachers are great, however it seems that the majority of teachers use traditional teaching methods, and the kids don't learn to think for themselves or learn to solve problems or even analyze what the problem is.

R: Do you find that when you do active activities with them, they are more engaged and interested or have the kids kind of fallen into a stupor after sitting in class for so many hours?

I: The kids are always willing to learn. But it's sometimes like pulling teeth to get them to answer questions and to think. However, I think that they just need to be encouraged constantly because they want to understand the activities.

R: When the teachers see you teaching in this active way, have some of them started to incorporate this into their regular teaching?

I: One of them, I think was already trying to do it. Now she's learning new games and new ideas for projects and has time to think about it more. I think with time it will increase with her. Another teacher seems to wait around for me to help—I can talk about a game with him that we're going to do and he'll run the whole thing but then I'll go and sit in on one of the classes where I haven't helped to plan it and he uses traditional methods. But I've only been working with the teachers for four months. It just takes time.

R: In your opinion, what factors would best increase the amount of EE being taught in the classroom—including more teacher training, additional resources or more specialists such as yourself in the classroom—anything you can think of that would encourage more teaching about the environment?

I: I think, in the Escuela Normale, they should incorporate teaching about the environment. I think they're doing that right now—they're teaching teachers how to raise viveros, how to do composting—but I don't know if they're teaching about how to think about how animals adapt or how to make up experiments or do investigations of any kind. But it would be a good idea to teach how to encourage students to think for themselves. I think labs should be required in primary and secondary schools and a science fair could be implemented into the program.

R: Do they do anything like that here, do they have science fairs?

I: Not that I know of. That would be a fun project to start up.

R: Is there anything else you can think of that would encourage more EE teaching in the classroom?

I: I think there should also be more workshops—kind of like in-service training—have workshops teaching teachers new games all the time—just new projects and more getting together and networking between teachers. Get rural schools together with Jinotepe schools—like Guisquiliapea—urban teachers together with rural teachers to share ideas. But do it more often during the semester because they have them after each semester—they have a bunch of workshops but they don't seem to do a lot in these workshops—they should be better planned. Teachers need to be encouraged by directors and technicos to implement experiments, games, nature walks, guest community speakers, etc. into the classes.

R: Have you sat in on any of these workshops?

I: No, but [someone else who works for my organization] has. She said it wasn't worth it for me to go—it was boring and she wasn't learning anything. However, I plan to go to these “talleres” and evaluate the activity for myself so as to contribute ideas to improve them.

R: When do the school semesters run here? School starts in February after the break and then they have a break in July?

I: Yes, and the last school semester ends in December.

R: During the time you've been here—you've been here during the school year mostly—have they had many of these workshops or in-service training days?

I: Just during the July break. They don't really have a lot of school here—it seems like every day is a fiesta and a half day of school every day. There's not a whole lot of school time.

R: So that might be another thing that could increase EE, more time in school.

I: Possibly, but the teachers can't teach what they don't know anything about or don't have initiative to learn about or plan for. More school time doesn't seem realistic at this point.

R: The next question is kind of on a different track. I've been focusing with you mainly on formal education because I know that's where you're doing a lot of work. Through living in the community, you've probably had the chance to see some of the community structures and I was wondering if you have any ideas of avenues of non-formal education that could be used to increase the amount of EE in the community?

I: It's hard where I live because there are so many problems, politically. There is a Commission of Development which never meets or does anything due to political arguments in the past. So, that's basically fallen apart. However, there is a group of people who work with the Health Center to teach people how to prevent malaria and other diseases. This is a possible avenue seeing as how health and the environment are so interconnected.

R: How big is your town?

I: 2,000 people.

R: Is there an ecological brigade there? There's not a high school in your town so there's no sort of ecological brigade . . . ?

I: No.

R: Is there any sort of earth club or environmental club at your school?

I: There's a group called, "Amigos de las Naturaleza" (Friends of Nature). They don't really work for the environment—they just call themselves that. During the July vacation, they helped me to dig holes to bury the garbage at the school, they helped me plant a garden and work on a compost pile—and they really enjoyed it.

R: Do they have a meeting once a week?

I: Every Saturday.

R: But, they don't usually do environmental things?

I: No.

R: So, that would be a non-formal avenue then to start working with that group.

I: Sure, good idea.

R: Is there anything else you'd like to add about which I haven't asked you specifically?

I: No.

R: Thank you.

Notas de la Entrevista con Fanny Vasquez y Dermien Zepea Mejía
MED-Carazo *Derman Zepea Mejía.*
1/9/97

Entrevistadora: Lic. Nicole Ardoin, El Centro de Educación Ambiental de Wisconsin
Traductora: Lic. Vonda Brown, Cuerpo de Paz


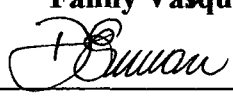
Por favor lea cuidadosamente las siguientes notas. Aun que esta no es una transcripción exacta de su entrevista, resume la información que Ud. dio. Haga cambios o correcciones directamente en las notas. Por favor siéntase libre de dar información adicional en las áreas donde Ud. piensa que sus respuestas están poco claras o engañosas. Pido que Ud. haga sus cambios a las notas de la entrevista y regresa esta transcripción entre un mes del recibo.

Después de hacer cambios a las notas de la entrevista, por favor firme la siguiente exposición para dar a la investigadora permiso a usar la información que le dio en su reporte final sobre educación ambiental en Carazo.

La investigadora pide permiso de usar cualquier parte de la entrevista que pueda dar dato para el estudio y permiso de incluirla en la publicación(es) final(es).

Yo he leído y editado las siguientes notas de la entrevista. Doy mi permiso a la entrevistadora de usar la información par los propósitos antes dichos.

Yo entiendo que si no devuelvo las notas a la investigadora entre 6 meses del día del recibo, estoy dando permiso para usar las notas como aparecen en la siguiente transcripción.

	<i>23-10-1997</i>
Fanny Vásquez	Fecha
	<i>23-10-1997</i>
Dermien Zepea Mejía	Fecha
<i>Derman Zepea Mejía</i>	

****Cuando termina, por favor regrese las notas firmadas en el sobre incluido a:**

Fax: Nicole Ardoin, Wisconsin Center for Environmental Education. 715-346-4698

Mandar: Nicole Ardoin, Environmental Education Specialist
Wisconsin Center for Environmental Education
403 Learning Resources Center, University of Wisconsin
Stevens Point, WI 54481 USA

Preguntas: Llama 715-346-4320 o correo-electronico nardo166@uwsp.edu

Si es absolutamente necesario la siguiente dirección nicaragüense se puede usar:

Nicole Ardoin
Compañeros Wisconsin-Nicaragua
Gallo y Villa Sur 1c al lago, 1c abajo
Managua, Nicaragua

("F" significa Fanny Vasquez, "D" significa Dermien Zepea Mejía, "V" significa traductora
Lic. Vonda Brown)

Entrevista con Fanny Vasquez y Dermien Zepea

MED-Carazo

1-9-97

V: ¿Cuántos profesores están trabajando en Carazo? ¿Qué calificación necesitan para ser profesor escolar?

D: Hay 1,091 profesores trabajando en las escuelas estatales y 287 in las privadas con un total de 1,378. Para ^{su} profesor se necesita cumplir el curso de profesor en la escuela Normal.

V: ¿Cuál es su posición en el MED y cuál es su cargo?

F: Soy Delegada Departamental; Coordinadora de las actividades a nivel departamental.

Soy responsable de 8 municipios en el departamento de Carazo. Soy orientadora de las actividades ~~y al mismo tiempo trabajo en los asuntos políticos~~ ^{Educativas emanadas de la Sede Central}. Hago visitas a los distintos centros para ~~ver si están cumpliendo los objetivos del MED~~ ^{dar seguimiento y control de} ~~los objetivos del MED~~ ^{planes y políticas del *}. También tengo que representar al MED-Carazo en todos los actos o actividades. Soy ~~coordinadora de las actividades~~ ^{Coordino trabajo} con otros ministerios como por ejemplo: MED trabaja con MINSAs en las actividades de vacunación, o salud de la familia y con MARENA con las brigadas ecológicas y sus planes de reforestación y limpieza.

V: ¿Cuales son los problemas ambientales más críticos de Carazo?

D: 1. La mala cultura ambiental, estamos tan acostumbrados ^a botar basura donde quiera. Se puede ver basura en las calles, en el mar, ríos, e275 2. Contaminación del aire por los carros.
* Políticas del Ministerio, no partidismo.

3. Basureros clandestinos. 4. Despale de maderas preciosas. 5. La mala condición económica de la población. No hay para la gente la alternativa de usar gas o electricidad a cambio de leña.

F: 1. Falta de cultura ambiental en el hogar. Enseñamos en el aula pero si el niño no ve en la familia un buen ejemplo no va a incorporar acciones ambientales en su vida. 2. Hay leyes ambientales ^{pero} faltan en el país los recursos ^{para hacer cumplir} de enfoquen las leyes. 3. Celos entre los ministerios y los profesores. Necesitamos más cooperación. 4. Desempleo.

V: ¿En el curriculum del MED en que áreas tienen enfoque o cosas en común con educación ambiental?

D: En el programa nacional del MED la mayoría del enfoque es en las Ciencias Naturales. En 4to grado los estudiantes estudian la conservación de los suelos y agua. En 6to grado estudian 20 horas de la preservación de la flora y fauna, preservación del las áreas silvestres, agua, suelo y aire también aprenden sobre huertos. En la secundaria los estudiantes del 5to año aprenden ideas generales de las leyes ambientales, y los conceptos básicos del manejo del medio ambiente. Tienen secciones enfocados en ecosistemas, relaciones entre hombre y ecosistema. Y las 60 horas de trabajo ecológico para poder recibir su diploma. *de bachiller.*

V: ¿Qué tipo de entrenamiento adicional reciben los profesores?

F: Tenemos cada año un tiempo donde los profesores participan en talleres y charlas. A veces ONGs da las charlas o sino el MED u otros ministerios.

V: ¿Cuales son las barreras más grandes para la educación ambiental en Carazo?

F: Falta de educación ambiental. Nos gustaría tener una campaña en la comunidad para ayudarnos con la educación de los alumnos. Cuando regresan a sus casas se olvidan lo que aprendieron en la escuela.

D: Falta de recursos de educación ambiental. Casi todo los ministerios y organizaciones a nivel municipal y departamental necesitan un presupuesto mas grande para realizar todas sus metas. También tenemos el problema de los celos. Todo mundo quiere tomar crédito para los logros pero pocos quieren trabajar en conjunto. Necesitamos más cooperación entre los ministerios, profesores y organizaciones.

F: Hay leyes y nuevos artículos en la constitución para proteger los Recursos Naturales pero nadie esta cumpliendo con estas leyes. *Falta recursos humanos y económicos para ejercer un trabajo de control y seguimiento de las leyes.*

V: ¿Qué tipos de recursos tiene el MED para enseñar educación ambiental?

D: Hay pocos recursos. En materiales escritos solo tenemos el que nos da MARENA o los texto de ciencias naturales, *haciendo uso de Museos Ecológica*

V: ¿Cuáles son las posibilidades más grandes para educación ambiental en Carazo?

D: Las Brigadas Ecológicas y la voluntad de algunos profesores y alumnos a participar en proyectos ambientales por supuesto la mayoría de los profesores no tienen tiempo para trabajar después de las horas del clase. Pero los que toman la responsabilidad están teniendo éxitos. Por ejemplo la Brigada Ecológica en Sn Marcos con el ayuda de la alcaldía esta limpiando un río. El MED no tenía todo los recursos para apoyar con la transportación entonces pusimos de acuerdo con los padres de familia y ellos pagaron el combustible y MED apoyó con el bus.

Contar con los recursos económicos y humanos para dar seguimiento y control a los proyectos de reforestación, medidas ambientalistas y

Appendix G-1
Teacher Survey in English

Carazo Department Teacher Survey

This questionnaire will provide information to be used in compiling a list of environmental education (EE) needs and recommendations for meeting those needs in Carazo. The study is being supported by MARENA, Nicaragua-Wisconsin Partners, and the University of Wisconsin - Stevens Point. The research team, headed up by an environmental education specialist from the Wisconsin Center for Environmental Education, is gathering information from a variety of sources in order to:

- determine environmental problems of particular concern to this area.
- determine environmental education needs in Carazo.
- identify organizations, institutions, and individuals involved in environmental education.
- review existing environmental education programs and evaluate achievement of their objectives.
- determine strategies for incorporating environmental education into schools and other organizations.

Through participating in this research process, you will assist in providing accurate, thorough and helpful information which will be used in creating an EE framework for Carazo. Thank you for your time and interest in this project.

Environmental Education

1. In your own words, define environmental education.

2. Do you feel that it is important to teach about the environment?

_____ Yes

_____ No

Please explain why or why not.

3. According to your definition, have you had any training specifically focusing on environmental education?

_____ Yes

_____ No

If yes, when and where? Through what organization or government agency was the training provided? Please describe briefly.

4. Please check resources that are currently available to you for teaching about the environment.

- | | | | |
|---|--|--|---|
| <input type="checkbox"/> Textbooks | <input type="checkbox"/> Videos | <input type="checkbox"/> Slides | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Local Parks | <input type="checkbox"/> School Forests | <input type="checkbox"/> Natural Areas | <input type="checkbox"/> University Specialists |
| <input type="checkbox"/> Posters | <input type="checkbox"/> Brochures | <input type="checkbox"/> Museums | <input type="checkbox"/> Picture Books |
| <input type="checkbox"/> Filmstrips | <input type="checkbox"/> Local environmental experts | <input type="checkbox"/> Scientific Models | <input type="checkbox"/> Community members with special enviro. knowledge |
| <input type="checkbox"/> Cassette Tapes | <input type="checkbox"/> Other (Please describe): | | |

5. What is the foremost constraint that prevents/would prevent you from teaching about the environment in your classes? (Please check one.)

- | | |
|---|--|
| <input type="checkbox"/> Lack of planning time | <input type="checkbox"/> Lack of environmental education training |
| <input type="checkbox"/> Lack of teaching time | <input type="checkbox"/> Lack of environmental education resources |
| <input type="checkbox"/> Other (Please describe): | |

6. What would encourage you the most to teach about the environment? (Choose the top two you would consider to be the most helpful.)

- | | |
|--|---|
| <input type="checkbox"/> More environmental education training | <input type="checkbox"/> More access to environmental education resources |
| <input type="checkbox"/> More planning time | <input type="checkbox"/> More time to teach all required subjects |
| <input type="checkbox"/> Time allotted during the school day specifically for teaching about the environment | <input type="checkbox"/> After school programs focused on environmental issues and activities |
| <input type="checkbox"/> Other (Please describe): | |

7. The following list of critical environmental issues was compiled by a group of educators, students, NGOs, government agencies, and environmental specialists in the fall of 1996. Please choose the top two issues you consider to be the most important.

- | | |
|--|---|
| <input type="checkbox"/> Trash | <input type="checkbox"/> Sewage Water |
| <input type="checkbox"/> Deforestation | <input type="checkbox"/> Water Contamination |
| <input type="checkbox"/> Lack of an Environmental Culture or Sensitivity | <input type="checkbox"/> Pesticide Poisoning |
| <input type="checkbox"/> Soil Erosion | <input type="checkbox"/> Other (Please describe): |

Teacher Background Information

8. How many total years have you been teaching?

1 2 3 4 5 6 7 8 9 Other: _____

9. Please circle the highest level of education you have completed.

_____ Primary school _____ Secondary School _____ Normal School
University (What university? _____ Concentration/Major: _____)
Graduate Degree (What university? _____ Degree received: _____)
Other (Please describe.):

10. Have you had any special training to be a teacher? _____ Yes _____ No
If yes, please describe.

11. Since becoming a teacher, have you had any additional teacher education?

_____ Yes _____ No

If yes, in what subjects/areas? Please describe training provided.

12. During an average school year, how many times are you provided with additional training?
(Please circle correct number.)

0 1 2 3 4 5 Other (Please specify): _____

Background Information on Students and Classroom Resources

13. How many total students do you have? _____

On average, how many hours a day do they attend school? _____

What is your average class size? _____

14. How many other teachers or assistants do you have in your classroom throughout the day?

0 1 2 3 4 5 Other (Please specify): _____

In what ways are they able to help you (For example, are they specialists in a certain topic and only deal with the students in regard to that topic such as reading or mathematics.)?

15. What is the range of ages of your students?

16. What subject(s) do you teach? (Please check all that apply.)

Science

Math

Spanish

Social Studies/History

English or other Foreign Language

Art

Environmental Education

Physical Education

Other (Please describe):

THANK YOU FOR YOUR TIME!

You will receive information on the results of this survey in January 1998.

Encuesta a Profesores del departamento de Carazo



Este cuestionario dará información para recopilar una list de las necesidades y recomendaciones para educación ambiental (EA) en Carazo. El estudio esta apoyado por MARENA, Los Compañeros de las Americas Nicaragua - Wisconsin, y la Universidad de Wisconsin. El equipo de investigación, encabezado por una especialista en educación ambiental del Centro de Educación Ambiental Wisconsin, esta colectando información de diversos fuentes para:

- determinar los problemas ambientales de más importancia para Carazo.
- determinar las necesidades para educación ambiental en Carazo.
- identificar los organismos instituciones e individuos involucrados en educación ambiental.
- revisar los programas que existen sobre educación ambiental y evluar los logros de sus objetivos.
- determinar estrategias para la involucración de educación ambiental en las escuelas y otros organismos.

A través de su participación en el proceso de investigación, Ud. ayudará a dar información precisa, completa y útil que será importante en la creación de una armazón de educación ambiental para Carazo. Muchas gracias por su tiempo e interés en este proyecto.

Educacion Ambiental

1. En sus propias palabras de una definición de educación ambiental.

2. Se siente que es importante enseñar sobre el ambiente?

_____ Si _____ No

Por favor explique porque si o porque no.

3. Ha incluido enseñanza sobre el ambiente en sus clases?

_____ Si _____ No

Si ha incluido, por favor describa en que manera.

4. Según su definición, ha tenido instrucción específica enfocado en educación ambiental?

_____ Si _____ No

Si la ha tenido, cuándo y en dónde? A través de cual organismo o agencia gubernamental? Por favor describa brevemente.

5. Por favor marque los recursos que Ud. tiene disponibles para enseñar sobre el ambiente.

- | | | | |
|------------------------|----------------------------------|---------------------------|---|
| _____ libros del texto | _____ videos | _____ folletos | _____ revistas |
| _____ parques locales | _____ bosques escolares | _____ areas naturales | _____ especialistas de la universidad |
| _____ afiches | _____ peliculas | _____ museos | _____ libros de fotos o dibujos |
| _____ filminas | _____ expertos ambientales | _____ modelos científicos | _____ miembros de la comunidad con conocimientos especial sobre el ambiente |
| _____ cassettes | _____ Otro (Por favor describa): | | |



6. Cuál es la limitante más grande que impide la enseñanza sobre el ambiente en sus clases?
(Por favor marque **uno**.)

___ Poco tiempo para planificación

___ Poco instrucción en educación ambiental

___ Poco tiempo para enseñanza

___ Poco recursos en educación ambiental

___ Otro (Por favor describa):

7. Qué animaría más a la enseñanza sobre el ambiente?
(Escoja los dos que Ud. considera los más adecuados.)

___ Más instrucción en educación ambiental

___ Más acceso a los recursos sobre educación ambiental

___ Más tiempo para planificación

___ Más tiempo para enseñar los requisitos

___ Tiempo durante el día escolar asignado específicamente para la enseñanza de educación ambiental

___ Un programa después de la hora de clase enfocado en los problemas y actividades ambientales

___ Otro (Por favor describa):

8. La siguiente lista de los problemas ambientales están recopilados por grupos de educadores, estudiantes, ONGs, agencias gubernamentales y especialistas ambientalistas. Por favor escoja **el problema (uno)** que considera Ud. es el más importante.

___ Basura

___ Agua Negras

___ Deforestación

___ Contaminación del agua

___ Falta de una cultura ambiental o sensibilidad ambiental

___ Envenenamiento por los pesticidas

___ Erosión de los suelos

___ Otro (Por favor, describa):



Información sobre los Profesores

9. Cuántos años ha dado clases?

1 2 3 4 5 6 7 8 9 Otro: _____

10. Por favor marque el nivel de educación más alto que ha cumplido.

_____ Primaria _____ Secundaria _____ Normal

Universidad

(Cuál universidad? _____ Carrera o Concentración _____)

Post-Grado

(Cuál universidad? _____ En que? _____)

Otro (Por favor describa):

11. Ha tenido Ud. instrucción especial para ser profesor?

_____ Yes _____ No

Si ha tenido, por favor describa.

12. En el tiempo de ser profesor, ha tenido instrucción adicional?

_____ Si _____ No

Si ha tenido, en cuales materias o areas del estudio? Por favor describa la instrucción.

13. Durante un año normal, cuantas veces recibe Ud. instrucción adicional?
(Por favor encierre con un circulo el numero correcto.)

0 1 2 3 4 5 Otro (Ser especifico): _____

Informacion de los estudiantes y recursos del aula

14. En total, cuantos estudiantes tiene? _____

Normalmente, cuantas horas asisten a clase? _____

En general, cuál es el tamaño de sus clases? _____

15. Durante el día cuantos ayudantes u otros profesores tiene en la aula?

0 1 2 3 4 5 Otro (Ser especifico): _____

De que manera te ayudan (Por ejemplo, esta un especialista en un area de estudio como lectura o matematica)?

16.Cuál es la extensión de las edades de sus estudiantes?

17. Cuales materias enseña Ud.? (Por favor marque todos que aplique.)

____ Ciencias Naturales

____ Matemática

____ Español

____ Historia / Ciencias Sociales

____ Ingles o otro idioma extranjera

____ Arte

____ Educación Ambiental

____ Educación Fisica

____ Otro (Por favor describa):

Gracias por su tiempo!

Recibí la información de esta encuesta en enero de 1998.

Appendix H
Teacher Survey Validity Panel Members

Name	Position and/or Affiliation
Vonda Brown	Environmental Educator, Peace Corps, Diriamba, Nicaragua
Silvio Echaverry	Carazo Departmental Delegate, MARENA, Diriamba, Nicaragua
Sally Ellingboe	Environmental Education Coordinator, Stevens Point Area Public Schools and Director, Boston School Forest
Anne Green	Outreach Program Coordinator, Wisconsin Center for Environmental Education
Ilene Grossman	State Assistant Coordinator, Project WET (Water Education for Teachers)
Jennie Lane	Wisconsin K-12 Energy Education Program Coordinator and Curriculum Specialist
Dan Sivek	Associate Professor of Environmental Education, College of Natural Resources, University of Wisconsin-Stevens Point and Secondary Education Specialist, Wisconsin Center for Environmental Education

Appendix I
Letter to Teacher Survey Validity Panel Members

August 1997

Dear Reviewer:

Attached please find a copy of a proposed "Teacher Survey" for use in a research project being conducted in the Carazo department of Nicaragua. First, it would be helpful for you to know a bit about the project. Then, it would be greatly appreciated if you could read through the survey and comment on its content and apparent validity.

Background Information on Nicaraguan Environmental Education Research

The importance of and need for environmental education has been rapidly increasing as natural resources continue to be depleted at a breathtaking rate around the world. A clean and healthy environment is critical to our physical as well as emotional well-being. Environmental education is an expanding field that can join diverse people through knowledge not only about the environment as a whole but, more importantly, knowledge specifically centered in their own community.

In order to support effective environmental education (EE), Nicaraguan government officials, resource managers, and citizens feel that more information is needed on what kinds of programs and resources are already available to them. Working through the Nicaraguan Ministry of Natural Resources and the Environment (MARENA), the Carazo Department (an area politically similar to a state or province) has volunteered to be the first focus area of this environmental education study as it already has several mechanisms in place for promoting EE programming through formal and non-formal venues. However, Carazo requires more concise information on the resources available and needs of its citizens with regard to this topic. This will be examined through a local as well as national perspective.

A study called "Rapid Assessment for Environmental Education" (RAEE) began in July 1997 to address these topics. RAEE will compile a comprehensive report on the current state of EE in Carazo using a combination of procedures including personal interviews and focus groups. A researcher from the Wisconsin Center for Environmental Education is working closely with MARENA and Wisconsin-Nicaragua Partners (WNP) to perform this assessment.

You are a participant in the information gathering part of this research. Your opinion of the attached survey questions will be extremely helpful in determining the appropriateness of these questions to address the abilities and attitudes of teachers with regard to environmental education in Carazo.

Specific Information Regarding the "Teacher Survey"

This survey is being conducted to determine how much influence classroom teachers have on environmental education and the possibilities for using the formal education system as a basis for unifying EE in the Carazo department. The information to be gained from the written survey portion of the research focuses on teachers' willingness to teach environmental education, preparation and teaching time available for EE, resources and materials available for EE, and previous training in the area.

Please read the proposed questions carefully, keeping in mind the objectives of the survey. Any feedback on what you feel is the ability of the questions to measure the information sought would be useful in the development of the final version of the survey.

If you have any questions, please do not hesitate to contact me at (715) 341-0748 (H) or (715) 346-4320 (W); FAX (715) 346-4698; e-mail nardo166@uwsp.edu. If you could have this reviewed and returned to me by Tuesday, Aug. 12, that would be wonderful.

Thank you very much for your time and assistance.

Sincerely yours,

Nicole M. Ardoin
Environmental Education Specialist

Appendix J
Draft Teacher Survey Reviewed by Validity Panel Members

Ideas for Teacher Survey

This questionnaire will provide information to be used in compiling a list of environmental education (EE) needs and recommendations for meeting them in the Carazo. The study is being supported by MARENA, Nicaragua-Wisconsin Partners, and the University of Wisconsin - Stevens Point. The research team, headed up by an environmental education specialist from the Wisconsin Center for Environmental Education, is gathering information from a variety of sources in order to:

- determine environmental problems of particular concern to this area.
- determine environmental education needs in Carazo.
- identify specific participants in and target audiences for environmental education programming.
- review existing environmental education programs and evaluate achievement of their objectives.
- determine strategies for incorporating environmental education into formal and non-formal educational system for both youth and adults.

Through participating in this research process, you will assist in providing accurate, thorough and helpful information which will be used in creating an EE framework for Carazo. Thank you for your time and interest in this project.

Teacher Background Information

1. How many years have you been teaching in your current school?
2. Please circle the highest level of education you have completed.

Primary school Secondary School University Graduate Degree Other

3. Have you had any special training to be a teacher?
4. Since becoming a teacher, have you had any in-service training? If so, in what subjects/areas?

Background Information on Students and Classroom Resources

6. How many total students do you have?
How many hours a day do they attend school?
If you teach more than one class of students, what is your average class size?
7. Do you have any other teachers or assistants in your classroom?
8. What is the range of ages of your students?
9. What subject(s) do you teach?
10. What kind of textbooks and resource materials do you have available?

Environmental Education

10. In your own words, define environmental education.
11. Have you had any training specifically focusing on environmental education? If so, when and where? Through what organization or government agency was the training provided?

12. What kind of resources are currently available to you for teaching environmental education (include local parks, school forests, environmental specialists, books and magazines, etc.)?
13. What is the foremost constraint which prevents/would prevent you from teaching environmental education in your classroom?
14. The following list of environmental education needs was compiled by non-government organizations, FUNCOD and MAN, working in Carazo. Please rank them in order of what you perceive to be the most important (#1) to the least important (#10).

(Choices to be determined through focus group.)

**REUNION COMISION AMBIENTAL DEL DEPARTAMENTO
DE CARAZO
ASISTENCIA**

NOMBRE Y APELLIDO	ORGANISMO/INSTI TUCION	DIRECCION	MUNICIPIO	TELEFONO/ FAX
Felix Cavallo Garcia	Policia Nacional	Km 47 C/Sur.	Jinotepe	041229921
Lies Van Mierlo	Hermanamiento	De Telcor una y media ^{al norte}	San Marcos	
JENN BLAKEMAN	CUERPO DE PAZ	COSTADO SUR DEL ^{CONCHA} MUNICIPAL	ROSA RIO	—
MERCEDES WARRUAZ A.	Alcaldia La paz L.	de Kartel 1 C al sur 1/2 este	La paz Carazo	5526404.
David Ricardo Mora.	SCOUT.	UNAV. 2/4 al Sur	Jinotepe	047-2957
Rogel Bermudez P.	Inst. Nac. Diriamon	Bº La Independencia	Diriamon	4222265
Fatima Martinez Gutierrez	Inst. La Salle	Bº FCO Chavez	Dba.	4222842
Consuelo del C. Rodriguez Amador	Inst. Alejandro Garcia Vedo.	Cartagena al NE. Departamental	Jinotepe	04122827.
Carlos Huñoe Vasquez	INPRMU.	TELOR 1/2 ARIBA	LA PAZ	—
Fidel Lanuza P.	POSAF	MARENDA - DREAMBA	DREAMBA	042 22243
Marvin Jose (Andrés) Pérez	MINSA	San Marcos.	San Marcos	04322301
Rosario P. Perquet Kofy	HEI	Entrada a Diriamon	Diriamon	
LENEIRO VARGAS	ALCALDIA - LA CONQUISTA	LA CONQUISTA - CARAZO	LA CONQUISTA	055-25956-57
Ada Fanny Vasquez F.	MED. San Marcos.	Planta alta Alcantaria.	San Marcos.	043-22-295
Demian Zepeda M	MED- Dental	Jinotepe		658
Pedro Maucecano	MARENS	Paso 1, 2º N S C. P.	Diriamon	22912-22507
Arsenio Lozama L.	Alcaldia	Configura TELCOR.	El Rosario	23393.
WALTER VAUGHAN ROSAS	ONG- NICAMBIENTAL	DE LA VICKY 2 C → SUR 1 C → ESTE; 1 C → SUR	HANAGUA.	2678267

ALTAMIRA D'ESTE

**REUNION COMISION AMBIENTAL DEL DEPARTAMENTO
DE CARAZO
ASISTENCIA**

NOMBRE Y APELLIDO	ORGANISMO/INSTI TUCION	DIRECCION	MUNICIPIO	TELEFONO/ FAX
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Efraín Chamorro	NICAMBIENTAL	Vicky 2c sur, Icarimba, Ica sur	Managua	2678267
Raúl Cruz Guadamuz	Radio Cepad	Sta. Teresa, Carazo	Sta. Teresa	041-23683
Gloria Rivas Leiva	MED	Sta Teresa - Carazo	Sta Teresa	041 23442
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LUIS MANUEL SILVA GONZALEZ	INATEC/POU TECNICO JINOTEPE	Km 47 1/2 c. SUR JINOTEPE	JINOTEPE	(0) 4122675
Mario Astola Hdez	CAPROSER	Shell 4 c. al ^{Diriamba} OESTE	Diriamba	042 22 443
Armando Yaramo Vaizquez	CAPROSER	IDEM	Diriamba	042 22 443
Rayando Cordero P.	C. Amb. Dolores	Alcaldia 7c al sur	Dolores	041-22078
Rayando Obregón C.	C. Amb. - UNIFAD	Telcar 1 c. Sur.	"	041-23548
Carlos Bolaños	PROSESUR	Banic 1c sur 1c ^{JINOTEPE} abajo	JINOTEPE	0412-2122
Marcelo Sánchez Pérez	MINSA	San Marcos	San Marcos	043 22 302
Rodrigo Luquet	MED	Diriamba	Diriamba	
Mónica Alemán Celada	MED - Rosario	Rosario	Rosario	
Marcelo García Hdz	ALSAM	San Marcos	San Marcos	043 22 375
Markku Pylehtäinen	Maren/KePa	Diriamba	Diriamba	

II-Problemas y alternativas en el trabajo de Educación Ambiental.

PROBLEMAS	CAUSAS	EFECTOS	ALTERNATIVAS
Falta de educación ambiental para la población	<ul style="list-style-type: none"> -Malos hábitos educativos escolares y sociales. -Influencia de la propaganda. -Desconocimiento de la importancia del medio ambiente. -La situación económica y desem....pleo. -Intereses económicos internos y externos 	<ul style="list-style-type: none"> -Dispersión dela basura. -Destrucción de recursos hídricos y vegetales. -Deforestación. -Contaminación generalizada. -Crisis, pobreza, mala salud y deterioro del medio ambiente. -Mal uso de plaguicidas. -Falta de credibilidad de las instituciones del estado. 	<ul style="list-style-type: none"> -Potenciar los medios de difusión. -Capacitación a docentes y padres de familia. -Introducir en los programas de estudio, a todos los niveles, contenidos relacionados con la ecología, el impacto ambiental, etc... -Buscar alternativas energéticas y tecnológicas: ejemplos la cocina Lorena, manejo de bosques y tacotal... -Crear sistemas agroforestales. -Manejo silvopastoril. -Ordenamiento de cultivos y apoyo financiero. -Servicio social ecológico. -Incentivos económicos a quienes mejoren el medio ambiente. -Fortalecimiento de la sociedad civil: que las comunidades manejen sus recursos naturales. -Reglamentación de la Ley Ambiental

Infuncionalidad de la Comisión Ambiental en los territorios	Mucha burocracia.	Falta de educación generalizada en el territorio.	-Hacer funcionar la Comisión. -Reestructurarla y planificar en cada uno de los territorios. -Descentralización -Fortalecimiento.
No existe una estrategia nacional de Educación Ambiental	No se le da la importancia que tiene para adoptar el cambio en el sistema de producción.	La población no se ha apropiado del manejo productivo que conlleve a un mejoramiento ambiental.	Que se implemente un plan estratégico de educación ambiental a nivel formal e informal.
Falta conciencia y conocimiento de los recursos naturales y del medio ambiente	-Divulgación mal dirigida hacia el medio rural. -Falta de capacitación.	-Despale indiscriminado. -Uso irracional de los recursos. -Pérdida de la biodiversidad. -Erosión.	-Divulgación, capacitación, y sensibilización más eficiente hacia el sector rural y urbano.
Falta de hábitos higiénicos	Poca orientación familiar y social	-Mal manejo de la basura. -Enfermedades.	-Educación familiar. -Formación de comités comunales. -Que las alcaldías asuman la recolección. -Ubicar la basura en lugares adecuados.
Mal uso de plaguicidas.	-Falta de conocimiento de uso y manejo. -Incumplimiento de leyes que no permiten el uso de plaguicidas prohibidos.	-Contaminación del medio. -Intoxicaciones. -Fitotoxicidad.	-Capacitación. -Uso de equipos de protección. -Implementación de las leyes. -Uso de productos naturales, orgánicos, biológicos.

Falta de coordinación de los diferentes organismos que luchan por el medio ambiente. <div style="text-align: right; border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin-left: 10px;">X</div>	-Falta de comunicación.	Desperdicio de recursos humanos y financieros.	-Realizar encuentros. -Formar una coordinadora que trabaje por la preservación del medio ambiente a nivel municipal, departamental y regional.
Falta de mecanismos de identificación de problemas y de metodología	Ausencia de organismos que asuman esas responsabilidades.	-Mal uso de suelo. -Deforestación.	Creación de organismos que se responsabilicen.

Appendix L
Personal Interview Data Analysis Document

- L-1 Interview Codes
- L-2 Interview Data Document

Appendix L-1
Interview Coding Chart

Interview Subjects' Organization Types:

- I = government, national level
- II = government, department level
- III = government, municipal level
- IV = national non-governmental organization
- V = local branch of national non-governmental organization
- VI = international government organization
- VII = academic (K-12)
- VIII = academic (university level)
- IX = independent institution

1. Carazo's most critical environmental problems that can be addressed through environmental education

- AIR = air pollution
- BD = loss of biodiversity
- CHEM = chemical contamination
- DEF = deforestation
- ECON = economic problems
- EE = lack of EE programs
- GRAY = gray waters or sewage waters (aguas negras)
- H2O = water contamination
- LAW = lack of legal enforcement of environmental laws and regulations
- NAT = loss of native species
- OVERP = overpopulation
- PERS = lack of understanding of the connection between personal actions and environmental problems
- PEST = pesticide poisoning/contamination
- SENS = lack of environmental sensitivity/environmental culture
- SLA = unsanitary slaughterhouses
- SOIL = soil erosion
- SW = solid waste (trash)
- TOX = toxic waste management

2. Environmental education programs currently under way in Carazo

- BRIG = ecological brigade (K-12)
- CAM = campaign
- CBRIG = community ecological brigade
- CMS = EE commission
- COMP = composting
- CONF = national level conference
- CURR = curriculum guide
- ECO = 60 mandated hours of ecological service (high school)
- HEA = health/hygiene-related programs
- INST = institutional strategy

K12 = K-12 program
MUS = museum education program
NATL = national strategy
PAR = parade
PEST = pesticide education
PK = visit to/interpretive program at park or natural area
RAD = radio program
REC = recycling
REF = reforestation
SCH = clean up on school grounds
SOL = solar ovens
STU = study
SW = solid waste management programs
TEC = technical assistance program
TNG = interpretive training in parks
TRAS = trash clean up (not on school grounds)
TREE = tree nursery
TTNG = teacher training
UNIV = university level program
XC = extra-curricular activities

3. Environmental education resources available TO the interviewee's organization

BIB = bibliography of available resources
CAS = cassette tape
COM = community member
CONF = conference proceedings
CURR = curriculum guide
EXP = environmental expert
FILM = filmstrip
FOR = school forest
MOD = scientific model
MUS = museum
NAT = natural area
PAM = pamphlet
PARK = local park
PICT = picture book
POST = poster
TEXT = textbook
TNG = training guide
UNIV = university specialist
VID = video tape

4. Environmental education resources available FROM the interviewee's organization

A/V = general audio-visual materials
BIB = bibliography of available resources
CAS = cassette tape
COM = community member

CONF = conference proceedings
CURR = curriculum guide
EXP = environmental expert
FILM = filmstrip
FOR = school forest
GEN = general statements about resources available from organization
MOD = scientific model
MUS = museum
NAT = natural area
PAM = pamphlet
PARK = local park
PICT = picture book
POST = poster
TEXT = textbook
TNG = training guide
UNIV = university specialist
VID = video tape

5. Funding/sponsors of environmental education projects

ADE = ADECA
AID = US AID
BID = Bank of International Development
CAN = Canadian government or NGO
CEC = CECOTROPIC
DAN = Danish government or NGO
EU = European Union
FIN = Finnish government or NGO
FUN = FUNCOD
GER = German government or NGO
HOL = Dutch government or NGO
IAB = Inter-American Bank of Development
MAN = MAN
MAR = MARENA
MAY = mayor's office
MED = MED
MINSAs = MINSAs
NAT = The Nature Conservancy
OXF = Oxfam
PC = Peace Corps
POS = POSAF
PROS = PROSESUR
PV = Private organizations
SWE = Swedish government or NGO
WB = World Bank
WWF = World Wildlife Fund

6. Problems with environmental education projects currently under way

\$ = lack of funding
CNG = project demands big change from participants' current lifestyle
COMM = lack of communication and coordination *between* projects / organizations
CONN = lack of connection of learning to "real life"
COORD = lack of internal coordination within project
COUN = lack of appropriate counterpart for foreign project
EE = lack of one person specifically focused on EE
FOL = lack of follow-up, follow through after program
FOR = foreigners work then leave
INT = lack of interest on the part of the participants
KNOW = lack of knowledge on the part of the project's leaders
LINT = lack of interest on the part of the leaders
LTIME = lack of time (leader)
ONE = one shot projects
PINT = program itself isn't interesting / locally applicable
PLAN = lack of long-term plan
SCH = working *only* in school grounds
TIME = lack of time (participant)
TNG = lack of educator training

7. Successes with environmental education projects currently under way

\$ = providing funding for EE
COM = work being done in the community
LOC = local community members are involved
SCH = work being done in schools (on grounds, in building)
STU = students are involved
TEACH = teachers are involved
WRK = community organizing workshops

8. Participants in environmental education projects currently under way

12 = junior high and high school students (7th - 12th grade)
AG = agricultural producers
CMS = local environmental education commission
COM = community members
GOVT = government employees and organizations
K = elementary school students (through 6th grade)
MD = media
NGO = non-governmental organizations/employees
PK = parks and protected area personnel
PRIV = private sector
TEACH = teachers
UNIV = university professors or students

9. Methods of delivering information/programs

DEM = demonstrations
INS = in-service training (K-12 teachers)
PRE = pre-service training (K-12 teachers)
WRK = workshops

10. Greatest barriers to teaching environmental education in Carazo

\$ = lack of funding
CNG = lack of willingness to make a big change in current lifestyle
COMM = lack of total community involvement
CONN = lack of connection of learning to “real life”
COORD = lack of coordination between formal/non-formal sector and between government agencies
GOV = bureaucracy and lack of government support
INT = lack of interest
KNOW = lack of knowledge
ONE = one-shot efforts on the part of organizations or trainers
PRI = environmental education is not a priority at a national level
RES = lack of resources
RESP = putting responsibility for environmental problems on others
SENS = lack of environmental sensitivity
TIME = lack of time
TNG = teaching style in which educators are trained (not very active, very traditional)
VERT = vertical chain-of-command structure—orders must come from the top

11. Factors that would best help to improve level of environmental education in formal setting

\$ = more funding
COORD = coordination between different government departments (MARENA, MED, MINSA, etc.)
EE = person specifically focused on environmental education
NET = development of environmental education network
PLAN = planning/coordination
TIME = more planning time
TNG = teacher and community leader training
YOU = more/better use of students and young people in environmental education projects

12. Nonformal Avenues

4S = Nicaraguan 4H
BRIG = community ecological brigades
CH = church groups
NG = neighborhood groups
SCO = boy and girl scouts
WOM = women’s groups

13. Increasing EE non-formally

EE = person specifically focused on EE within community

FOR = public forum

ORG = method of organizing concerned citizens

TNG = training

WK = community workshops

14. Collaborating Institutions and Groups (Currently collaborating or possible partners)

ALC = Alcadia (Mayor's office)

CEC = CECOTROPIC

COMARENA = COMARENA (Santa Teresa's Commission of Natural Resources)

FTF = Farmer to Farmer

FUN = FUNCOD

IUCN = International Union for the Conservation of Nature

MAG = Ministry of Agriculture BIB = bibliography of available resources

MAN = MAN

MARENA = MARENA

MD = media

MED = MED

MINSA = MINSA

NAAEE = NAAEE (North American Association for Environmental Education)

NAT = Nature Conservancy

PC = Peace Corps

POS = POSAF

PRIV = Private sector

PROS = PROSESUR

15. Environmental Education Programs in Planning for Future Implementation

(See codes under section number two.)

Appendix L-2
Interview Data Document

Interview Subjects' Organization Types:

- I = government, national level (5, 6, 8, 11)
- II = government, department level (1, 16, 22)
- III = government, municipal level (9, 21)
- IV = national non-governmental organization (15, 20)
- V = local branch of national non-governmental organization (7, 18, 23)
- VI = international government organization (2, 3, 4, 12, 13)
- VII = academic (K-12) (10, 17)
- VIII = academic (university level) (19)
- IX = independent institution (14)

Note on Codes Following Passages: Throughout this compiled coding document, each interview passage is followed by a code. The codes provide the following information: The first roman numeral represents the organizational type that the interview subject represents. (See the top of this page, "Interview Subjects' Organization Types," for a full listing of roman numeral codes and organization types.) In the following example, the subject's organization belongs to group I, the national-level governmental agencies. The next Arabic numeral is the unique interview number. To ensure anonymity, the interview subjects are identified only by their organization type and interview number. In the following example, the quote is from interview subject number five. The third number in the first set of parentheses identifies the page number from the transcription on which this quote can be found. The second set of parentheses indicates in which coding section this piece of information was placed. For example, this quote can be found in section number 1 ("Carazo's most critical environmental problems that can be addressed through environmental education") under the topic of deforestation, coded as "DEF." The third set of parentheses contains information on the other sections in which this particular piece of information may be found. In addition to section 1 under deforestation, the following quote was also coded and placed in section number 1 (Most Critical Environmental Problems) under "H20" or water contamination, and "EE" or a lack of environmental education. If the passage is included in only one section, the third set of parentheses will read (XX).

- We have a document which expresses which problems are the priority—including deforestation, water contamination and the lack of environmental education. The two main problems stated in that document are deforestation and environmental and water contamination. (I, 5, 2) (1.DEF) (1.H20; 1.EE)

Note on Style of Translations: Some of the interview translations were done in the first person (for example, if the interview subject said, “I think deforestation is the most critical environmental problem,” the sentence was translated as such), while other translations were done in the third person (for example, if the interview subject said in Spanish, “I think that deforestation is the most critical environmental problem,” the sentence was translated as “He says that he thinks that deforestation is the most critical environmental problem.” Because of this difference, the passages presented in this compiled document may not all be in the same format. However, in the body of the text, the researcher used brackets to indicate when the interview subject’s passage was being changed to the first person. Again, using the above example, if the translation was “He says that he thinks that deforestation is the most critical environmental problem,” in the text of the document, this passage would read, “[I think] that deforestation is the most critical environmental problem.”

1. Carazo’s most critical environmental problems that can be addressed through environmental education:

1.AIR = air pollution

- All the issues—such as solid waste management, air pollution, water pollution—are engineering, legislation, and infrastructure problems. (VI, 2, 8) (1.AIR) (2.H2O; 2.SW)
- Car exhaust [serious environmental problem in Diriamba] (III, 9, 1) (1.AIR) (XX)
- Air pollution from the cars. (II, 16, 1) (1.AIR) (XX)
- She said that one of the biggest problems that she sees here in Nicaragua is contamination or pollution. She’s talking about pollution—sound pollution, air pollution, water pollution, solid wastes. She says that in Managua a lot of people burn their garbage so they have a lot of air pollution—burn tires. (IV, 20, 1) (1.AIR) (1.H2O; 1.SW)

1.BD = loss of biodiversity

- A promotion of the importance of a return to diversity in nature and food sources should definitely be addressed. (VI, 12, 2) (1.BD) (XX)

1.CHEM = chemical contamination

- In Carazo, there is also the problem of water and soil contamination from chemical use in the coffee plantations. (I, 8, 1) (1.CHEM) (XX)

- They need some money to start putting up signs and messages to stop the people from poisoning the river to get out the crabs. People poison the river to get out the crabs but they don't realize that the crabs that they're getting are poisonous and that they're poisoning themselves and that they're disrupting the system of the crab -- they're killing the young. (III, 17, 2) (1.H2O) (1.CHEM)

1.DEF = deforestation

- Renewable energy so we can reduce the pressure on the fuel wood; will be growing forests to produce firewood and wood for commercial uses (II, 1, 7) (1.DEF) (XX)
- But in the rural areas I would definitely say deforestation could be addressed through environmental education. (VI, 3, 1) (1.DEF) (XX)
- It's just ... they know that the problems are deforestation but they'll be the first ones to say that they'd rather have their food cooked on firewood than on a gas stove because it has a better flavor. (VI, 3, 3)
- The commission is also interested in protecting/planting trees. The areas that have been losing trees are getting dryer and hotter. I think they're really interested in preserving the beauty here and, more than that, preserving the climate. (VI, 4, 2) (1.DEF) (XX)
- We have a document which expresses which problems are the priority—including deforestation, water contamination and the lack of environmental education. The two main problems stated in that document are deforestation and environmental and water contamination. (I, 5, 2) (1.DEF) (1.H2O; 1.EE)
- The rate of growth, as always, depends on the amount of rain and quality of soils. Depleted soils of the watershed of the Rio Grande and the 60 to 70 percent rate of deforestation is the number one cause that POSAF is working on in Carazo. (V, 7, 1) (1.DEF) (XX)
- Carazo has many problems. Some of these include: . . . (2) Changes in the microclimate due to deforestation. (V, 7, 1) (1.DEF) (XX)
- The same problems as in the rest of Nicaragua. (1) Deforestation which leads to the disappearance of rivers, flooding, problems with water quality. (2) Water pollution from discarded city waters due to badly designed aqueduct systems. (I, 8, 1) (1.DEF) (1.H2O)
- She says actually there's no one problem, there are several problems but one of the problems she considers the most serious problem is the watershed of the Rio Grande—which actually is one-third of the area of the whole state of Carazo. There has been a whole lot of deforestation that has occurred there and of course the habitat of many species has been lost

and of course the rivers have diminished their flow but of course right now some programs have been implemented in order to try to restore the ecosystem of the watershed. (VII, 10, 2) (1.DEF) (2.H20)

- The deforestation in some areas of the state which, of course, [I consider] that that is a problem that can not be solved by one institution alone and the joint work and activities and coordination and cooperation between the civil society and non-government organizations and government institutions in order to attack and try to solve that problem jointly. (VII, 10, 2) (1.DEF) (XX)
- For example, it's very common that people say the main environmental problem in Nicaragua is deforestation and if you ask them why that's happening, they say, well it's because MARENA has given them the permission. (VI, 13, 2) (1.DEF) (XX)
- At the beginning, during the first 6 or 7 months, they [Peace Corps volunteers] give charlas directly to the students on different environmental topics like garbage, deforestation, topics that are important in their community. (VI, 13, 4) (1.DEF) (9.WRK; 8.K; 1.SW; 2.K12)
- The deforestation of the zone is the principal problem, it brings on negative consequences such as soil erosion, disappearance of the flora and fauna, the drying out of the rivers, etc. (IX, 14, 1) (1.DEF) (1.SOIL, 1.H20, 1.NAT)
- Beginning in the 1940s, up to today, Nicaragua has lost more than 60 percent of its forests, representing about two-thirds of the country's original forests. (IV, 15, 1) (1.DEF) (XX)
- Cutting of precious wood. (II, 16, 1) (1.DEF) (XX)
- Right now deforestation is happening at a high rate and without control within Nicaragua and it's drying up the water sources. San Marcos doesn't have many water sources and the ones that they do have been disappearing due to deforestation. Near by the city there is a water source and it is disappearing. They've been working with the commission and some Swiss and German NGOs to reforest and try to save the water source. (III, 17, 1) (1.DEF) (1.H20)
- Also, nearby there is a rock mined which is being exploited by the poorer people of the community and it has caused a social/economic problem. They can't take away the only employment these people have but, at the same time, their type of work is causing more environmental problems that is changing the climate and drying up rivers. He believes that if it's not controlled at this problem that this water source and the Rio Dulce Nombre will dry up in the next four years. (III, 17, 1) (1.DEF) (1.ECON; 1.H20)

- On Monday at 5PM, their commission is going to get together and they're also going to talk about problems about permission to cut trees and the need to get EE into the rural zones for the management of garbage and dirty waters. (III, 17, 2) (1.DEF) (1.H2O; 1.SW)
- He also said that the coastal part of San Marcos, they have a lot of roads going in there that trucks and such have not been able to get in so the deforestation is down in comparison to a lot of places. They have just started going in and cutting down trees so now they have a commission that is trying to stop that. (III, 17, 3) (1.DEF) (XX)
- She said the other problem is deforestation—that a lot of people don't understand the importance of trees and that if they do cut the trees that it will make the climate a lot hotter and that it also adds to the pollution. She said part of their work was to try to bring out a conscience in the people to plant trees and protect the trees. (IV, 20, 1) (1.DEF) (XX)
- He said another problem that they have, because of the economic situation and the unemployment, is that even though people know that it's wrong to cut down a tree or that it's damaging their environment, they still do it. Up until this point, they haven't been able to control the problem. They've been trying to work with the police -- it's a continual process to work with the police but they're finding that they're not getting many results by fining or putting people in prison or getting them in trouble with the law. He would like to see an education campaign for this type of problem. (III, 21, 1) (1.DEF) (1.ECON)
- He also sees deforestation and the drying up of rivers because of that as big problems in Carazo, and contaminated water. But he basically sees garbage and water quality as the most important. (V, 23, 6) (1.DEF) (1.SW; 1.H2O)

1.ECON = economic situation in the country

- To speak of solutions in this country, with the bad economic situation, is very difficult, because it is very difficult to say to a farmer not to cut down a tree that will serve for cooking purposes. It is difficult to say not to take turtle eggs because this is a source of subsistence. Without presenting them with sources of employment there cannot be other alternatives and in the meantime they will continue to destroy the environment. (IX, 14, 1) (1.ECON) (XX)
- The poor economic condition of the people. There are no alternatives for the people to use gas or electricity instead of fire wood. (II, 16, 1) (1.ECON) (XX)
- Unemployment. (II, 16, 1) (1.ECON) (XX)

- In the end, poverty is the real problem. They don't have any economic resources to provide for their family. With this fish poisoning, they are immediately rewarded w/ money. (II, 1, 5) (1.ECON) (1.PEST)
- Carazo has many problems. Some of these include: (4) Water pollution due to the economic conditions. For example, the poisoning of rivers to harvest shrimp. (V, 7, 1) (1.ECON) (1.H20, 1.PEST)
- Also, nearby there is a rock mined which is being exploited by the poorer people of the community and it has caused a social/economic problem. They can't take away the only employment these people have but, at the same time, their type of work is causing more environmental problems that is changing the climate and drying up rivers. He believes that if it's not controlled at this problem that this water source and the Rio Dulce Nombre will dry up in the next four years. (III, 17, 1) (1.ECON) (1.DEF; 1.H2O)
- He said another problem that they have, because of the economic situation and the unemployment, is that even though people know that it's wrong to cut down a tree or that it's damaging their environment, they still do it. Up until this point, they haven't been able to control the problem. They've been trying to work with the police—it's a continual process to work with the police but they're finding that they're not getting many results by fining or putting people in prison or getting them in trouble with the law. He would like to see an education campaign for this type of problem. (III, 21, 1) (1.ECON) (1.DEF)
- A lot of people would say that it's the economic situation—that's one of the problems. But [I don't] believe that—[I believe] it's more the interest to work and the voluntude of the people. [I've] done a lot of inviting people who should be in charge of these kind of programs to different meetings and activities and they don't seem to want to come. And *then* for [me] would come the economics. But [I] would say that's after the lack of interest. It's more the people that are in charge of these different things that don't have the interest, but should be leading. They're the ones that can do a lot and they're supposedly the ones that should have interest. (V, 23, 11) (1.ECON) (10.INT)

1.EE = lack of environmental education programs

- We have a document that expresses which problems are the priority—including deforestation, water contamination and the lack of environmental education. The two main problems stated in that document are deforestation and environmental and water contamination. (I, 5, 2) (1.AIR) (1.H20; 1.DEF)

- Carazo has many problems. Some of these include: . . . (5) Not enough environmental education campaigns. (V, 7, 1) (1.AIR) (XX)
- These problems can be solved in the following manner: (1) Environmental education that is directed toward children, which are a large percentage of the population, is important to increase the permanency of formal education in the schools and to reinforce it with institutional aspects that should begin in the NGOs as well as state organizations (mayors and others) that help control the principal contamination sources of the cities. Example: solid waste treatment: good locations and collection, recycling. (IV, 15, 2) (1.EE) (1.PERS)
- She finds that education is another problem—that the schools don't have any dedication to EE. The teachers don't have a space or know how to teach about protecting the environment, or where to put the garbage, things about the water. If the kids knew this, they could be leaders in their homes because, at this point, it's very difficult to teach adults—there's no formal way to teach them and they learn a lot more slowly than children and when children learn they learn faster and she believes they could be leaders in the home for changing. (V, 18, 1) (1.EE) (XX)

1.GRAY = gray waters (aguas negras)

- I would say the “dirty waters”, the run-off. (VI, 3, 1) (1.GRAY) (XX)
- We have a recently formed environmental commission and the problems we've targeted begin with basura—trash. It is the biggest concern right now—not just because it doesn't look good but also we've had outbreaks of diarrhea and dengue and other mosquito/fly related illnesses. It's got a lot to do with the improper disposal of trash. Also the dirty water that people throw out of their patios. (VI, 4, 2) (1.GRAY) (1.SW)
- But I'd definitely say trash/aguas servidas is the number one problem. (VI, 4, 2) (1.GRAY) (1.SW)
- The second program in the works is the “fosa” or “pila septica.” It's just kind of a big hole with sand in the bottom of it—it doesn't sound too technical and it really isn't. You just dig a big hole and throw some different grades of sand in it and that's where they're going to throw the contaminated water instead of throwing it in the street. The pilas will reduce the volume of standing, contaminated water. (VI, 4, 5) (1.GRAY) (2.SW)
- [One of the most serious environmental problems in Diriamba is the] problem with agua servidas (service waters, gray water). (III, 9, 1) (1.GRAY) (XX)

- He says that this kind of education [yearly campaigns] could help with problems such as garbage, aguas negras. In the rural areas, it can help also with the garbage, the lack of latrines and the management of water. (III, 17, 1) (1.GRAY) (1.SW)
- She also sees “agua negras”—a lot of people throw them in the streets and that causes sicknesses and epidemics if there’s a lot of dirty water running around. (V, 18, 1) (1.GRAY) (XX)
- Another problem they have is the service waters. They don’t have septic tanks in the houses so they get in the streets and they’re trying to put in a new sewage system for the whole town that they hope to have completed in 1998. (III, 21, 1) (1.GRAY) (XX)
- The second problem and they’re working is a hygienic problem—keeping the community schools’ food and everything adequately clean. This incorporates garbage problems, sources of contamination, problems with “agua negras”, places where mosquito larvae would grow. (II, 22, 2) (1.GRAY) (XX)
- A big problem is that there is a lot of waste that is untreated. (II, 22, 1) (1.GRAY) (XX)
- He said that the major problems he can see are garbage and sewage waters and water quality. (V, 23, 6) (1.GRAY) (1.SW; 1.H2O)

1.H20 = water contamination

- All the issues—such as solid waste management, air pollution, water pollution—are engineering, legislation, and infrastructure problems. (VI, 2, 8) (1.H20) (2.SW; 2.AIR)
- We have a document which expresses which problems are the priority—including deforestation, water contamination and the lack of environmental education. The two main problems stated in that document are deforestation and environmental and water contamination. (I, 5, 2) (1.H20) (1.DEF; 1.EE)
- Carazo has many problems. Some of these include: . . . (4) Water pollution due to the economic conditions. For example, the poisoning of rivers to harvest shrimp. (V, 7, 1) (1.H20) (1.PEST, 1.ECON)
- The same problems as in the rest of Nicaragua. (1) Deforestation which leads to the disappearance of rivers, flooding, problems with water quality. (2) Water pollution from discarded city waters due to badly designed aqueduct systems. (I, 8, 1) (1.H20) (1.DEF)
- River pollution and poisoning [serious environmental problem in Diriamba] (III, 9, 1) (1.H20) (XX)

- She says actually there's no one problem, there are several problems but one of the problems she considers the most serious problem is the watershed of the Rio Grande—which actually is one-third of the area of the whole state of Carazo. There has been a whole lot of deforestation that has occurred there and of course the habitat of many species has been lost and of course the rivers have diminished their flow but of course right now some programs have been implemented in order to try to restore the ecosystem of the watershed. (VII, 10, 2) (1.H20) (2.DEF)
- The deforestation of the zone is the principal problem, it brings on negative consequences such as soil erosion, disappearance of the flora and fauna, the drying out of the rivers, etc. (IX, 14, 1) (1.H20) (1.SOIL, 1.DEF, 1.NAT)
- These wastes [referring to plastics and trash thrown in the streets] end up in the ocean, damaging the marine ecosystem, which causes the death of many animal and plant species. Not only does it damage the oceans but also the countryside and its species leading to the consequence of more poverty and hunger in the population. (IX, 14, 1) (1.H20) (1.NAT, 1.SW)
- Trash along the shores of rivers contaminate them and eventually that trash ends up in the ocean. (IX, 14, 1) (1.H20) (1.SW)
- Its 132,000 km² of territory is becoming very contaminated; [the people] are subjected to multiple threats that result in a loss of important natural resources and the drying out of rivers. (IV, 15, 1) (1.H20) (XX)
- Right now deforestation is happening at a high rate and without control within Nicaragua and it's drying up the water sources. San Marcos doesn't have many water sources and the ones that they do have been disappearing due to deforestation. Near by the city there is a water source and it is disappearing. They've been working with the commission and some Swiss and German NGOs to reforest and try to save the water source. (III, 17, 1) (1.H20) (1.DEF)
- Also, nearby there is a rock mined which is being exploited by the poorer people of the community and it has caused a social/economic problem. They can't take away the only employment these people have but, at the same time, their type of work is causing more environmental problems that is changing the climate and drying up rivers. He believes that if it's not controlled at this problem that this water source and the Rio Dulce Nombre will dry up in the next four years. (III, 17, 1) (1.H20) (1.ECON; 1.DEF)
- He said that the first point is really a large point so he's been listing them one by one. Another problem he sees is the "dirty waters". They're going to try to put in a septic system

within the town here but their septic tanks are about 2 km. out of San Marcos and they do have a treatment plan made for the water but it comes out about 90% pure and that goes straight into the Laguna of Masaya and this will continue to contaminate the Laguna which already has a lot of contamination problems. He believes that this Laguna could be a solution to the water problem here if it was kept clean and pure because a lot of these other sources are drying up right now—and if they don't change it will get worse. (III, 17, 1) (1.H2O) (XX)

- They need some money to start putting up signs and messages to stop the people from poisoning the river to get out the crabs. People poison the river to get out the crabs but they don't realize that the crabs that they're getting are poisonous and that they're poisoning themselves and that they're disrupting the system of the crab—they're killing the young. (III, 17, 2) (1.H2O) (1.CHEM)
- On Monday at 5PM, their commission is going to get together and they're also going to talk about problems about permission to cut trees and the need to get EE into the rural zones for the management of garbage and dirty waters. (III, 17, 2) (1.H2O) (1.DEF; 1.SW)
- People poison the rivers to get out the crabs but they don't realize that the crabs that they're getting are poisonous and that they're poisoning themselves and that they're disrupting the system of the crab—they're killing the young. (III, 17, 2) (1.H2O) (1.PEST)
- He believes [the most critical environmental problems are] water, city waste, and small industry waste. (VIII, 19, 1) (1.H2O) (1.SW)
- She said that one of the biggest problems that she sees here in Nicaragua is contamination or pollution. She's talking about pollution—sound pollution, air pollution, water pollution, solid wastes. She says that in Managua a lot of people burn their garbage so they have a lot of air pollution—burn tires. (IV, 20, 1) (1.H2O) (1.SW; 1.AIR)
- Pollution in the community of water and soils and in the garbage has been the cause for the top six important health issues. Different kinds of sicknesses including infectious diseases, diarrhea and things like that. (II, 22,1) (1.H2O) (1.SW, 1.SOIL)
- She also says that pollution of rivers is a big problem here with the chemical used to get shrimp out of the rivers. The people need this kind of activity to survive but, at the same time, they don't know about the problems that they're causing by poisoning the rivers and, in this, you can use the EE to help them realize that using chemicals in the river in the end will hurt them. (II, 22, 1) (1.H2O) (1.PEST)

- It was thought before to be the problem of MARENA but the vision has changed now and with this acknowledgment of the connection they are able to see that such things as contaminated rivers and garbage problems are the leading factors to their health problems. (II, 22, 1) (1.H2O) (1.SW)
- He said that the major problems he can see are garbage and sewage waters and water quality. (V, 23, 6) (1.H2O) (1.GRAY; 1.SW)
- He also sees deforestation and the drying up of rivers because of that as big problems in Carazo, and contaminated water. But he basically sees garbage and water quality as the most important. (V, 23, 6) (1.H2O) (1.SW; 1.DEF)

LAW = lack of legal enforcement of environmental laws and regulations

- There are environmental laws but a lack of resources to focus on these laws and enforce them. (II, 16, 1) (1.LAW) (XX)
- There are laws and new articles in the constitution to protect the natural resources but no one complies with these laws. There is a lack of human resources and economics to exercise the job of control and follow-up to these laws. (II, 16, 2) (1.LAW) (XX)

1.NAT = loss of native species

- Carazo has many problems. Some of these include: . . . (3) Disappearance of native species. (V, 7, 1) (1.NAT) (XX)
- The deforestation of the zone is the principal problem, it brings on negative consequences such as soil erosion, disappearance of the flora and fauna, the drying out of the rivers, etc. (IX, 14, 1) (1.NAT) (1.SOIL, 1.H2O, 1.DEF)
- These wastes [referring to plastics and trash thrown in the streets] end up in the ocean, damaging the marine ecosystem, which causes the death of many animal and plant species. Not only does it damages the ocean but also the countryside and its species leading to the consequence of more poverty and hunger in the population. (IX, 14, 1) (1.NAT) (1.H2O, 1.SW)
- They just need to get some organization there to also help with the problem of disappearing of fauna which is mainly the shrimp and crab that are in the water. They need some money to start putting up signs and messages to stop the people from poisoning the river to get out the crabs. (III, 17, 2) (1.NAT) (XX)

1.OVERP = overpopulation

- Agriculture appears to be the cause of all environmental problems in that it leads to overpopulation. Agriculture traps us into a system in which we have sufficient food supply for the current population. This population reproduces and greater food resources are required. In order to feed the increasing population, clearcutting and other techniques such as fertilizers and pesticides must be implemented to increase production and in turn population once again. (VI, 12, 2) (1.OVERP) (XX)

1.PERS = lack of understanding of the connection between personal actions and environmental problems

- If you talk about garbage, well, because the mayor's office isn't gathering the garbage. In other words, it's other people's problem, not our problem. And, yes, we recognize that there are consequences of that in terms of deforestation and soil losses, contamination of soils in the rivers and watersheds and all kinds of consequences that people are not aware that they have some part and need to figure out what to do about it. (VI, 13, 2) (1.PERS) (XX)
- Yes, and a lot of time people don't recognize the difference between the problem and consequence, that's another one. Because, some people say it's deforestation while other people, if they're in the agricultural community, will say, "Well, the soil is poor, is not producing, and the productivity of the soil is declining" and that's a consequence of deforestation but they know that something has changed and that something needs to be done. The problem is that we don't see *us* as part of the problem. The other matter that is very important for me is that we can't continue saying, "you can't do this, you can't do that" and creating laws. There are two ways to address this problem: a normative one—using the laws and the other one is using awareness—get into the consciousness of the people so they realize that managing natural resources we can continue forever but, if we overexploit them, we have a short term resource. So, basically, it's not a matter of just knowing the problem, it's a matter of doing something and providing an alternative to people. There are people in very poor communities that even if they recognize the problem, they have to get food for their family today and tomorrow, they don't see a month. (VI, 13, 3) (1.PERS) (XX)
- These problems can be solved in the following manner: (1) Environmental education that is directed toward children, which are a large percentage of the population, is important to increase the permanency of formal education in the schools and to reinforce it with institutional aspects that should begin in the NGOs as well as state organizations (mayors

and others) that help control the principal contamination sources of the cities. Example: solid waste treatment—good locations and collection, recycling. (IV, 15, 2) (1.PERS) (1.EE)

- Lack of an environmental culture in the home. We teach it in the classroom but if the child doesn't see a good example in their family, he or she is not going to incorporate environmental actions in his or her life. (II, 16, 1) (1.PERS) (1.SENS)

1. PEST = pesticide poisoning/contamination

- one of the important problems becoming very common is using poison to catch freshwater fish (and shrimp); practice developed due to poverty levels/rural populations lack of education; some of these people don't know what these practices can do; don't understand the consequences. This practice developed during the famous green revolution, cotton was planted and demanded lots of pesticides. Many farmers transported the pesticides in large barrels, washed out the barrels in the river and noticed that the fish were dying. Wouldn't eat them themselves but then would sell at market (II, 1, 4) (1.PEST) (XX)
- There is regulation but it's hard to prove what they did. (who committed the act of using pesticides to fish shrimp, in order to sanction that person). If MARENA people catch them, they put them in jail for three days but then can't prove what they did so must release them. Now have environmental laws and more legal ways to report/enforce punishment to people who commit such crimes. (II, 1, 5) (1.PEST) (XX)
- This [fish poisoning] is a important problem. Not only taking punitive measures but to make people aware of the problem. Must develop consciousness about the negative effects of this practice. Some of these NGOs like FUNCOD and MAN are trying to get information out to these rural people. In the end, poverty is the real problem. They don't have any economic resources to provide for their family. With this fish poisoning, they are immediately rewarded with money. (II, 1, 5) (1.PEST) (1.ECON)
- Carazo has many problems. Some of these include: (4) Water pollution due to the economic conditions. For example, the poisoning of rivers to harvest shrimp. (V, 7, 1) (1.PEST) (1.H2O, 1.ECON)
- People poison the rivers to get out the crabs but they don't realize that the crabs that they're getting are poisonous and that they're poisoning themselves and that they're disrupting the system of the crab—they're killing the young. (III, 17, 2) (1.PEST) (1.H2O)
- Number 7 [most important health/environmental related problem] is the poisoning from pesticides. (II, 22, 1) (XX)

- She also says that pollution of rivers is a big problem here with the chemical used to get shrimp out of the rivers. The people need this kind of activity to survive but, at the same time, they don't know about the problems that they're causing by poisoning the rivers and, in this, you can use the EE to help them realize that using chemicals in the river in the end will hurt them. (II, 22, 1) (1.PEST) (1.H2O)
- A lot of people just use them in their house to kill different animals and they don't think about the dangers of using these pesticides. (II, 22, 2) (1.PEST) (XX)

1.SENS = lack of environmental sensitivity/environmental culture

- The major one, at the base of most of the problems, is to increase the level of environmental ethic—this is a problem in the United States as well—creating a citizenry who is aware of and concerned about environmental problems enough to change their behaviors. (VI, 2, 2) (1.SENS) (XX)
- A program for EE in Carazo should be attached to the specific problems of Carazo. I think that the program should start with a sensitization to make people aware of the problem—the people need to be aware and sensitized to the problem—about environmental problems in general. I think that's a general need that we have here in Nicaragua. (I, 5, 2) (1.SENS) (XX)
- EE in the line of increasing awareness because here in Nicaragua we haven't done big campaigns to sensitize the population so all the time the money that the government or MARENA has is not enough. EE is not as important as it should be in the eyes of the people who are at the head of the ministry. (I, 5, 3) (1.SENS) (2.CAM)
- The problem is that we are at the stage where people know what the problems are but not how they affect them. For instance, do you happen to know the spectrum of environmental behavior? (awareness, knowledge, attitudes/values, citizen action skills, citizen action participation) We are in the very first stage so we have the whole spectrum to go on in order to make people realize that we are responsible for the environmental problems that occur in our own communities and that's what we are trying to impress the most. Move the audience from where we are to the next stage where they can be part of organizations and community groups and do something. (VI, 13, 2) (1.SENS) (XX)
- . . . many of the principle causes of death amongst children and adults are due to illnesses associated with an unhealthy environment—for example, cholera, dengue, diarrhea,

respiratory (lung) problems, and so on. This is tied to the way in which people from both the city and the countryside live, caused by a lack of environmental culture. (IV, 15, 1) (XX)

- The poor environmental culture—we are accustomed to throwing our trash wherever we want. One can see trash in the streets, the ocean, rivers, etc. (II, 16, 1) (1.SENS) (1.SW)
- Lack of an environmental culture in the home. We teach it in the classroom but if the child doesn't see a good example in their family, he or she is not going to incorporate environmental actions in his or her life. (II, 16, 1) (1.SENS) (1.PERS)
- He says that he feels the number one barrier is the missing or nonexistent environmental culture or concern about the environment. (III, 21, 2) (1.SENS) (XX)
- He says that one of the main problems is that people here don't know what environmental education is and he says that a lot of things don't work out because they think it's only collecting, picking up garbage or working in a farm with the nuns . . . (V, 23, 4) (1.SENS) (6.KNOW)
- And he sees another problem as the wants of the people to work in this. He said that, as far as having environmental education, you could take care of the problem by 40 to 50% if you just had people who wanted to work in it, or work with it. (V, 23, 6) (1.SENS) (XX)

SLA = unsanitary slaughterhouse conditions

- The second problem is that they have a butchering area where they kill the animals (slaughterhouse) and the town is trying to put a up a new place that would be more hygienic to deposit of the waste. (III, 21, 1) (1.SLA) (XX)

1.SOIL = soil erosion

- Carazo has many problems. Some of these include: (1) Soil erosion by water and wind. (V, 7, 1) (1.SOIL) (XX)
- The deforestation of the zone is the principal problem, it brings on negative consequences such as soil erosion, disappearance of the flora and fauna, the drying out of the rivers, etc. (IX, 14, 1) (1.SOIL) (1.DEF, 1.H2O, 1.NAT)
- Pollution in the community of water and soils and in the garbage has been the cause for the top six important health issues. Different kinds of sicknesses including infectious diseases, diarrhea and things like that. (II, 22,1) (1.SOIL) (1.H2O, 1.SW)

1.SW = solid waste (trash)

- On the other hand, I think that waste management is a very big problem—people throw garbage and all their waste and water and sewage or the rain water drainage system which eventually will contaminate surface water sources (rivers, lakes). (II, 1, 7) (1.SW) (XX)
- Within the city, I would say garbage and garbage dumps. (VI, 3, 1) (1.SW) (XX)
- You'll go into a school and it might be their week of the environment and they have all this stuff that says "Clean up" and they actually might have a trash cans around and all the kids throw it in when they're in the school but they walk outside and buy a bag of something and throw it on the ground right away. (VI, 3, 2) (1.SW) (XX)
- And they can go on and tell you and tell you and tell you, if you sit down with anybody, they know that you shouldn't throw garbage in the streets. But every time it rains, all the garbage washes away and they don't see it or else they think the animals eat it or they don't know how long it's hanging around because they don't see it. Also, men come through the streets and sweep it up every day so people just throw it in the streets and people are just like, "Well, someone will come sweep it up." (VI, 3, 3) (1.SW) (XX)
- All the issues—such as solid waste management, air pollution, water pollution—are engineering, legislation, and infrastructure problems. (VI, 2, 8) (1.SW) (2.H20; 2.AIR)
- We have a recently formed environmental commission and the problems we've targeted begin with basura—trash. It is the biggest concern right now—not just because it doesn't look good but also we've had outbreaks of diarrhea and dengue and other mosquito/fly related illnesses. It's got a lot to do with the improper disposal of trash. Also the dirty water that people throw out of their patios. (VI, 4, 2) (1.SW) (1.GRAY)
- But I'd definitely say trash/aguas servidas is the number one problem. (VI, 4, 2) (1.SW) (1.GRAY)
- Our next big project is trash—they had a senor who came around and picked up trash in the streets but they've had a lot of problems with that because he can't handle the volume of trash and he's been sick. The Alcadia [mayor's office] hasn't been charging for trash collection and they just don't have the manpower to run it. They're trying to change the trash program to set up something like they have in Leon (with the organic trash collected—they hope to generate revenues from compost). (VI, 4, 4) (1.SW) (15.TRAS)
- Garbage problems [most critical environmental problem in Diriamba] (III, 9, 1) (1.SW) (XX)

- And on the top of that is also the solid waste management—the management of all kinds of garbage (VII, 10, 2) (1.SW) (XX)
- . . . That is the most critical issue—solid waste management or toxic waste management—all the leftovers—what you can see in Nicaragua. It's so obvious. (I, 11, 3) (1.SW) (1.TOX)
- #2 = Garbage—contaminated water, soils, plastic bags in the streets. (VI, 12, 2) (1.SW) (XX)
- At the beginning, during the first 6 or 7 months, [the Peace Corps volunteers] give talks directly to the students on different environmental topics like garbage, deforestation, topics that are important in their community. (VI, 13, 4) (1.SW) (9.WRK; 8.K; 2.K12; 1.DEF)
- The contamination of the environment by solid waste comes from the plastic culture in which we live. We throw out bags, aluminum cans, glass, etc. (IX, 14, 1) (1.SW) (XX)
- These wastes [referring to plastics and trash thrown in the streets] end up in the ocean, damaging the marine ecosystem, which causes the death of many animal and plant species. Not only does it damage the oceans but also the countryside and its species leading to the consequence of more poverty and hunger in the population. (IX, 14, 1) (1.SW) (1.NAT, 1.H20)
- The trash cans are sources of much contamination through the breeding of flies, which cause a lot of diarrhea in children. (IX, 14, 1) (1.SW) (XX)
- Trash along the shores of rivers contaminate them and eventually that trash ends up in the ocean. (IX, 14, 1) (1.SW) (1.H20)
- Contamination as a result of trash is a serious problem because many of the principle causes of death amongst children and adults are due to illnesses associated with an unhealthy environment—for example, cholera, dengue, diarrhea, respiratory (lung) problems, and so on. (IV, 15, 1) (1.SW) (XX)
- The poor environmental culture—we are accustomed to throwing our trash wherever we want. One can see trash in the streets, the ocean, rivers, etc. (II, 16, 1) (1.SW) (1.SENS)
- Clandestine (hidden) trash dumps. (II, 16, 1) (1.SW) (XX)
- He says that this kind of education [yearly campaigns] could help with problems such as garbage, aguas negras. In the rural areas, it can help also with the garbage, the lack of latrines and the management of water. (III, 17, 1) (1.SW) (1.GRAY)
- He said he has to add that in San Marcos they need a plan of how they'll manage the garbage. They have an overuse of plastic that is non-biodegradable—it needs 300 or more years to biodegrade. Their dump was unplanned and they don't have any garbage treatment

- or any garbage treatment plant—only to burn and what burns, burns and what stays, stays. He says they need to have a better treatment plan and find some alternatives like recycling and separating different parts of the garbage. (III, 17, 1) (1.SW) (XX)
- On Monday at 5PM, their commission is going to get together and they're also going to talk about problems about permission to cut trees and the need to get EE into the rural zones for the management of garbage and dirty waters. (III, 17, 2) (1.SW) (1.DEF; 1.H2O)
 - She said that one of the main problems she sees is dump sites and dump locations. They haven't been giving them any good location spots as of now and also garbage collection. (V, 18, 1) (1.SW) (XX)
 - He believes [the most critical environmental problems are] water, city waste, and small industry waste. (VIII, 19, 1) (1.SW) (1.H2O)
 - She said that one of the biggest problems that she sees here in Nicaragua is contamination or pollution. She's talking about pollution—sound pollution, air pollution, water pollution, solid wastes. She says that in Managua a lot of people burn their garbage so they have a lot of air pollution—burn tires. (IV, 20, 1) (1.SW) (1.H2O; 1.AIR)
 - He sees the number one problem as the garbage dumps—they're very close to town right now and they're looking for some land at least one kilometer from town to put the dumps. They're also looking into a landfill project and they have a few people investigating that possibility. The engineer, Sandra Morena, and several engineering students that are doing the investigation work on how to manage the solid waste problem. (III, 21, 1) (1.SW) (XX)
 - He said that in the town of Jinotepe, they don't have the means to collect the garbage properly—they need at least two more trucks to do the garbage collection properly but they're trying to do what they can with what they have. (III, 21, 1) (1.SW) (XX)
 - Pollution in the community of water and soils and in the garbage has been the cause for the top six important health issues. Different kinds of sicknesses including infectious diseases, diarrhea and things like that. (II, 22,1) (1.SW) (1.SOIL, 1.H2O)
 - She said there are two problems that are especially related to public health. One of these is garbage—there's many factors about garbage here that make it—the disposal of garbage is very unhygienic. In areas where the public is usually at, as in parks, markets, green areas, there are a lot of problems in the placement of garbage which causes infectious diseases, diarrhea, and parasites. (II, 22, 1) (1.SW) (XX)
 - It was thought before to be the problem of MARENA but the vision has changed now and with this acknowledgment of the connection they are able to see that such things as

contaminated rivers and garbage problems are the leading factors to their health problems.
(II, 22, 1) (1.SW) (1.H2O)

- He said he can also show you where the dump sites are so you can see where people indiscriminately throw trash in little breaks in the land, little ditches. . . (V, 23, 6) (1.SW) (XX)
- He said that the major problems he can see are garbage and sewage waters and water quality. (V, 23, 6) (1.SW) (1.GRAY; 1.H2O)
- He also sees deforestation and the drying up of rivers because of that as big problems in Carazo, and contaminated water. But he basically sees garbage and water quality as the most important. (V, 23, 6) (1.SW) (1.DEF; 1.H2O)

1.TOX = toxic waste management

- . . . That is the most critical issue—solid waste management or toxic waste management—all the leftovers—what you can see in Nicaragua. It's so obvious. (I, 11, 3) (1.TOX) (1.SW)

2. Environmental education programs currently under way in Carazo

2.BRIG = ecological brigade (K-12)

- I started trying to work with some of the Brigade groups in the schools (VI, 3, 2) (2.BRIG) (XX)
- So if they did activities, it was just within the school like putting up posters to clean up the school or cleaning up the school themselves or maybe planting some trees, but within the school grounds and within school hours. (VI, 3, 2) (2.BRIG) (XX)
- The Centro de Salud works with the school's health brigade, and we formed an Ecological Brigade at the school so a lot of it is just the coordination of the activities between the groups represented on commission: the Alcadia [the mayor's office], [the health center], [municipal] police, and the brigades. (VI, 4, 3) (2.BRIG) (14.ALC; 14.MINSA)
- The way it stands right now on the itinerary, the Ecological Brigades are going door to door and explaining how to separate organic and inorganic trash and explaining that trash recollection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the Alcadia [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (2.BRIG) (2.COMP; 2.TRAS; 8.12; 8.COMM; 14.ALC)

- It's just like with the schools—it's kind of just picking the right groups. Like with the brigade—when we first started out with the brigade, we just kind of threw 40 students together and it just crashed and burned. It was crazy. So, we went back and said we would pick students who were doing well in school, and we'll try to get a combination of discipline going and some interest maybe so it's worked a lot better with the smaller groups. You have to stick to smaller groups here because people get off track really fast. The bigger the groups get, the harder it is and it just defeats your purpose. I'd definitely say the best groups to work with are small groups with the same interests—like small religious groups, small brigades in the schools, small brigades in the communities. (VI, 4, 10) (2.BRIG) (12.BRIG; 6.INT)
- Within this institution, we have had a variety of programs with the youth of Nicaragua in what is called “Brigadas Ecologicas Municipales” (BEM) or Municipal Ecological Brigades. BEM are very popular and have had many good results. (I, 8, 1) (2.BRIG) (8.12)
- In 1990, [I] organized two brigades formed by 80 students and it was started because [I] felt the need to do something to make people conscious of environmental problems. (VII, 10, 1) (2.BRIG) (XX)
- . . . One of the two most important things [MED is] involved with, as far as the environmental education theme or issue, is the organization of the ecological brigades at the primary level and also the ecological social service that the students at the secondary level need that as a requisite to graduate. So that's one of the most important things that [I think] are being imposed by the Ministry of Education. (I, 11, 2) (2.BRIG) (2.ECO; 8.K; 8.12)
- We [Peace Corps volunteers] are focusing on primary schools, rural schools (although we work in Diriamba and some towns) and we work with Ecological Brigades at the high school level. (VI, 13, 4) (2.BRIG) (XX)
- FUNCOD has campaigns in schools such as seminars, presentations, as well as being a pioneer in the organization of ecology clubs since the 1980s, whose goals are to better the environment through reforestation. Example: the campaign to plant the national tree, which is on its way to extinction, and through this a project has been developed called “Protection and Conservation of National Species,” of which 12 [native tree species] are affected. (IV, 15, 2) (2.BRI) (2.K12, 2.REF)
- [Interviewer] What are the biggest possibilities for environmental education in Carazo? [Subject] The Ecological Brigades and the willingness of some teachers and students to participate in environmental projects. (II, 16, 2) (2.BRIG) (XX)

- For example, the Ecological Brigade in San Marcos, with the help of the mayor's office, is cleaning up the river. The MED does not have the resources to give transportation support so we made an agreement with the heads of households and they pay the gas and MED gives the bus. We have economic and human resources to continue and control the reforestation and environmental projects, and the jurisdictional aspect. (II, 16, 2-3) (2.BRIG) (6.\$, 14.PRIV, 14.MED)
- He said as far as the deforestation problem, they also have in the schools Ecological Brigades that have been working right out front—they work every day. Different school children come in and work. And in the month of September they hope to have a reforestation plan for the urban areas of Jinotepe—for the entrance and exit part of Jinotepe, the cemetery and the parks. (III, 21, 1) (2.BRIG) (2.REF)
- One of the results from these talks [given by the Jinotepe mayor's office] is that after the talks they have formed Ecological Brigades and they keep working in the environmental sector, incorporating new students and strengthening all the time so they see that as a good possibility for EE. (III, 21, 2) (2.BRIG) (XX)

2.CAM = campaign

- And everybody wants these huge campaigns. They want a big parade, a big campaign, they want a one-time blurb, and that's what they also see as environmental education. You know, Plan Playa is that clean-up, the Easter weekend clean-up. And it goes great, people yell at each other for throwing their garbage on the ground at the beach, and they say, "See, haven't you listened to the kids?" It's this big campaign, but it's only a week and then everybody goes back home and throws it in their backyard or on the streets. And for a short time it's a success. (VI, 3, 7) (2.CAM) (XX)
- They're very popular because they usually include big posters, big noise, T-shirts, stickers, fun stuff, a party kind of situation going on And then it's over with like it's a lot of energy and a lot of fun and it really fits into the culture here as far as getting people's attention. (VI, 3, 7) (2.CAM) (XX)
- Campaigns—that's all I've worked with in Nicaragua. (VI, 3, 7) (2.CAM) (XX)
- But he wants like these big campaigns so everybody sees so everybody says, "MED is doing something." Everybody's interested in getting all this credit and that's why everybody likes campaigns because they're these big, wonderful things that are flashy and bring in all this attention, bring in all this press attention, get your picture in the paper, like "I'm doing

something” and nothing gets done. That’s why I don’t see any of these organizations as really being effective. (VI, 3, 8) (2.CAM) (XX)

- We are trying to design a campaign. Three things we’re working on: a strategy, the pilot program and a campaign that we are trying to design for the next four months but we don’t have enough money so I don’t know if we’ll be able to do the campaign that we’re trying to do. (I, 5, 3) (2.CAM) (2.NATL; 6.\$)
- EE in the line of increasing awareness because here in Nicaragua we haven’t done big campaigns to sensitize the population so all the time the money that the government or MARENA has is not enough—EE is not as important as it should be in the eyes of the people who are at the head of the ministry. (I, 5, 3) (2.CAM) (1.SENS)
- For example, during Easter week, young people [in the Ecological Brigades] work on the heavily visited beach areas educating vacationers and residents to keep the waters and beach itself clear of garbage. (I, 8, 1) (2.CAM) (2.TRAS)
- They’re working on what’s called the Plan Playa, which is the type of project that takes place during the summer vacations and the brigades go to the different beach resorts around the area, around here on the coast, and they try to train the tourists to help manage the waste—not to throw it on the beaches. The activities that they develop—picking up the waste and all that. They also give talks to the different people that are there—telling them about the negative effects of throwing the waste on beaches. (VII, 10, 2) (2.CAM) (2.TRAS)
- And the fact that they do that, she says that she has a lot of requests from most of the students to participate in the brigade and to work with it because they organize tours of the beaches, Plan Playa thing and they go some other places on tours related to biodiversity and forests and parks and since she does all kind of activities, a lot of students try to get involved with the brigade to work with her, participate in all those activities. (VII, 10, 3) (2.CAM) (XX)
- They [boy/girl scouts] do some community service and work but it depends on different communities—they do environmental. projects more like campaigns like collecting garbage or something like that. There are two different groups—one is the ecological brigades that were organized through the mayor’s office at the beginning then MARENA took them over. Then there are the 4H groups—started through the Nicaragua Institute for Agricultural Extension. This is something taken from the United States—4H but here it is called 4S. They are planning to focus on training youth groups to work on agricultural projects. So,

Ecological Brigades and 4S are the ones I know. (VI, 13, 5) (2.CAM) (12.SCO; 2.TRAS; 14.MARENA; 12.4S)

- Schools, different organizations and political groups have a kind of systematic EE. It comes and goes—it's a one time thing—they have a big campaign. It's kind of like the festivals of the patron saint. They come once a year and go past but there's no education that continues. (III, 17, 1) (2.CAM) (6.FOL)
- She said that, with health education, in every area, SILAS works within the communities—with talks within the communities—with speaker systems they have on the top of trucks, posters, announcements—in some communities it's more effective than in others. That's mainly because in some communities there's more emphasis or more health problems so they emphasize more in some communities than in other communities. (II, 22, 1) (2.CAM) (14.MINSA; 2.HEA)

2.CBRIG = community ecological brigade

- So, I tried to find some people that wanted to do things in the community and that's when we formed the Municipal Brigade which is some kids in high school but most are either in their last year or they're in the university. And they list the problems and they think up the solutions and they work on them. (VI, 3, 2) (2.CBRIG) (XX)

2.CMS = EE commission

- We are organizing EE commissions at state level—already have one, forming one at city level who then is forming one at a rural level (the idea is to have a whole net of EE commissions at rural, county, and state levels); in the process of organizing them—almost all of them are organized; all 8 counties already have EE commission at county level; asking many people to be involved at an organizational level and then volunteer on a personal level; Ministry of Education, local NGOs are also involved; last Friday, commission meeting for one county, 60 people attended, local NGOs, governmental representatives (II, 1, 3) (2.CMS) (XX)
- This state commission with the proper mechanisms will prevent this thing from happening; whoever comes into the state and wants to do something having to do with the environment, they must go through the state commission so that the commission knows what they are going to do and not duplicate the efforts (II, 1, 10) (2.CMS) (XX)

- The state commission is sort of coordinated by MARENA, but not only MARENA. Two other people are working with us—one person from UNA and one representative from CECOTROPIC, which is another NGO. He's the secretary of the commission, he's a newspaper man, he's the one who is doing the publicity and extends the invitations, since he has access to the media and communication—Humberto Campos. (II, 1, 10) (2.CMS) (XX)
- [Interviewer] You said you created an EE commission—is that here in El Rosario?
[Subject] Yes, it's coordination between sectors/representatives of the population to find rapid solutions to environmental problems. We have a department of Carazo regional meeting every month, and they were pushing people to form environmental commissions in each area so Santa Theresa has one, El Rosario has one, Diriamba has one—just about all of the municipals have one. (VI, 4, 2) (2.CMS) (8.GVT)
- It was a really big struggle the first month, but I started attending the Department of Carazo environmental meetings, and I started bugging some people here about going. And the environmental commission formed around that. (VI, 4, 3) (2.CMS) (XX)
- I know of few or no programs that are working in this respect. The Commission of the Environment and Natural Resources, COMARENA. (III, 9, 1) (2.CMS) (14.MARENA)
- Recently the mayor's office has been setting up the Municipal Commission for the Environment and Natural Resources (COMARENA) headed by the vice-mayor. (III, 9, 1) (2.CMS) (XX)
- First he explained the environmental commission. He's part of the environmental commission of San Marcos. It's formed by the current mayor. In the commission, the people of the town participate together—the ecologists, the teachers, students, MINSA, community organizations. They have planned to have participation from the University of Mobile and an association of workers from the rural areas which is formed by farmers and producers. (III, 17, 2) (2.CMS) (XX)
- Her job has been organizing commissions in the different areas in Carazo and helping the rural areas, places called “comarques” which are the small communities outside of the urban area, to form their own commissions so they can work within their own community. So, mainly working with this with MARENA and with myself. She's trying to give incentive to these people to solve their own problems. (V, 18, 1) (2.CMS) (7.COM; 14.MARENA)
- Now through commissions and different integrated works, [MARENA and MINSA are] trying to solve these problems between the individual community and their environment. They just started with this process and having this vision—it doesn't mean that they haven't

done things within EE in the past but they've been very particular to certain areas and very related to just health. (II, 22, 1) (2.CMS) (XX)

- There's a lot of commissions but there's no system and she believes that the focus should be more on the leaders of the communities such as the mayors. They should take this as one of their responsibilities and not just leave it up to MED or MINSA or MARENA. There needs to be a coordination between the different institutions and sectors. In Carazo, there have been some advances and this has mainly been through commission meetings—getting together and talking about these problems but in practice there's very little being done. A lot of activities are sporadic—there's not a lot of carry through, nothing is really strongly developed as far as in the education. (II, 22, 2) (2.CMS) (10.COORD)
- There's a commission in Jinotepe and that's the only one that really works in environmental issues and it is supported by the mayor's office—and this is their structure. They work under the development of the environment, and they have different things put under it such as culture, sports, and . . . it's called the Commission of Social Prevention. The police are the ones that wanted to form this more than anybody so they're one of the main supporters of the commission. (V, 23, 3) (2.CMS) (XX)
- [Jinotepe's environmental] commission really hasn't done anything. It's mainly because the mayor has everything centralized so everything has to go for him and he was away for awhile in Spain, and he doesn't know exactly what he was doing there. (V, 23, 3) (2.CMS) (10.GOV)
- [For CECOTROPIC, I'm] working with the commissions of environmental education in each of the towns and also in the departmental level . . . (V, 23, 7) (2.CMS) (XX)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (2.CMS) (14.MAR; 14.CEC; 14.FUN; 14.POS; 5.GER)
- The departmental commission is formed of the eight commissions that are from the municipalities of Carazo and so each municipality has members that are interested in

environmental education and they come to the departmental commission. Each of the eight commissions have different characteristics—if you want to know about those, [I participate] in those meetings as well. (V, 23, 9) (2.CMS) (XX)

- [I believe] that the strongest commission is COMARENA (Comission de Recursos Naturales)—which is in Santa Teresa and [I] can get you the document for them. And they're really strong because they've had a long time since they've formed and they have a lot of documentation. But that's not to say that the commissions aren't working in the other areas. A lot of them are working because of the individuals involved—like there's one or two that are doing most of the work in the different commissions as in [my case] that is working here as a motivator trying to get the commission to do different things. Dolores, which is the little town between Diriamba and Jinotepe, they have been working with talks to the community and replanting trees. El Rosario, which is the little town that we're going to today—they have the goal that they want to be the greenest and cleanest municipality. (V, 23, 9) (2.CMS) (XX)
- [I don't] want to forget the commission of La Conquista which is also working really well. They're working with the problem of cleaning up of their rivers and getting the shrimp population up. Also, they're working in cleaning up the town and the municipality. Most of the commissions are headed by the vice-mayors, with the exception of Diriamba where it is headed by the mayor. (V, 23, 9) (2.CMS) (XX)
- [Diriamba's environmental commission] has [me] a little bit concerned because it's only working in the rural areas, there's not anything going on within the town and a lot of the problem is that it has a political interest. The only people involved are from the liberal party and that it's not really a city interest—though the mayor of Diriamba does seem to have some interest in the environment. (V, 23, 9) (2.CMS) (10.GOV)
- [I'll] talk a little bit about the members of each group and how they're a little different. In Diriamba, they don't work with any of the organizations like the NGOs. None of the NGOs are part of the commission, or students or teachers—it's just the mini-mayors. For each commission, you can ask [me] more questions if you have any questions about them. It's organized with mini-mayors that live in the rural communities and they're part of the commission. (V, 23, 9) (2.CMS) (XX)
- In Dolores, [the environmental commission is] basically a family that runs the commission. It's the father-in-law and the son, the brother-in-law and the family—they all meet together in the commission. In San Marcos, they have students, they have participation of the

teachers and the ecological brigades—it's got a good mix of people. (V, 23, 9) (2.CMS) (XX)

- In El Rosario, [the environmental commission] also [has] a good mix. They have people from the health department that are also in the commission. (V, 23, 10) (2.CMS) (7.STU; 7.LOC)
- In Jinotepe, [the environmental commission is] also party oriented and there are some people that are included and there are some people that aren't and that depends on the politics. The Jinotepe mayor doesn't have very good relations with MARENA so they aren't involved in their environmental commission. Some groups are working independently in Jinotepe—they haven't been invited to the commission or wanted to participate but they're still doing work in environmental education. (V, 23, 10) (2.CMS) (10.GOV)
- In Santa Teresa, he said that even though [the environmental commission is] working very well, it's mainly focused on communities around Chacocente and organizations that are working around there and not on anything else that works in Santa Teresa and there's a lot of jealousy between these different groups that are working there. (V, 23, 10) (2.CMS) (XX)
- In La Conquista [on the environmental commission], there's also a good mix of students and health workers so each commission has a mix of members that's a little bit different. (V, 23, 10) (2.CMS) (7.STU; 7.LOC)
- [I] mentioned the political problems mainly to give you an idea that this has been hurting the environmental education—that you should be able to take out the political ideology but, unfortunately, a lot of these commissions have problems with this. (V, 23, 10) (2.CMS) (10.GOV)

2.COMP = composting

- The way it stands right now on the itinerary, the Ecological Brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash collection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the Alcadia [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (2.COMP) (2.BRIG; 2.TRAS; 8.12; 8.COMM; 14.ALC)

2.CONF = national level conference

- MARENA is the one that is promoting the organization of these commissions. In November, we had a conference at the national level (Nov. 11 to 13) on EE. From there we made several suggestions on things that could be done on EE. We're trying to establish a network on the national level to exchange experiences; to establish whatever actions we think are necessary to attack the problem and to use our human resources in the best ways. (II, 1, 4) (2.CONF) (XX)
- We had the great opportunity to put together 250 people and had the opportunity to make the departments or local committees and for almost the first time, it was an opportunity to talk about the conceptualization of EE, to the methodologies that the people are taking—political lines and strategic lines. (I, 5, 6) (2.CONF) (XX)
- I was reading documents on the conference on environmental education from last October... no, not last October but the October or November from a year ago. VB/SE: November, no December of 1996... NA: Right, and it sounds like a lot of the information in the strategic plan came from that meeting. And at that meeting you had representatives from all the departments to come together to determine environmental problems and important actions. (I, 6, 2) (2.CONF) (2.NATL)
- We had the second meeting in November 1997. (I, 6, 3) (2.CONF) (4.CONF)
- We gave them general information—like, this year we're going to have here in Nicaragua a big conference of environmental education that NAAEE is doing—this April. (I, 6, 3) (2.CONF) (XX)
- So, we had two topics we focused on at the second meeting. The strategy—their suggestions around the document—and the second topic was the planning, the action. The people decide what are the objectives for the third meeting—and they designed that, where the third meeting will happen, and the mechanism to communicate all the comments on the thing. In the proceedings you will find the objectives for the third meeting. [Interviewer] And that will be taking place in July? [Subject] In July—the third meeting, in Granada, near Carazo. (I, 6, 4) (2.CONF) (XX)

2.CURR = curriculum guide

- They have in there their guide book that tells what the teachers are supposed to include what to teach the kids. (VI, 3, 4) (2.CURR) (XX)

- From the beginning of preschool and primary school they address several issues and at those stages of the education curriculum, the students are taught how to separate and classify solid waste and so on and as they advance to the secondary level some other more complex issues are addressed like environmental pollution, loss of habitat and the loss of several species of flora and fauna. And that's about the way they go about it—from the most simple things in the early school days to the most complex things as they go on to the secondary level. (I, 11, 3) (2.CURR) (2.K12; 8.K; 8.12)
- For the last six months, [MAN has] been focusing on education in the schools and they have started with workshops for the teachers. They're trying to develop a guide book for teachers to use. They've been working with the schools that are supporters of MAN. It's like a pilot project that has been working with the guide book for three years and they started with the kids. The guide book is for the teachers and they've been using it in the schools for three years. (IV, 20, 1) (2.CURR) (2.TTNG; 2.K12; 8.TEACH)
- She said that that's what [MAN is] trying to do right now. The book that they have, they want it to be used all around Nicaragua but in their workshops that's where they're getting ideas for their regional specifications. She said they have sections in the book on water, biodiversity and soil. They're trying to get more Nicaraguan pictures because there are a lot of foreign books that come in here and have elephants and other things in them so they would like to have animals from Nicaragua and if they're going to show a lake, they want it to be a lake from Nicaragua also. That's what they're in the process of doing now—making it more Nicaraguan. (IV, 20, 2) (2.CURR) (XX)
- She says that it is secure that they'll use this guidebook. They've had two meetings with the curriculum directors at MED and they're very excited about it and they like the form because up to this point Nicaragua hasn't had a guide book for EE. (IV, 20, 2) (2.CURR) (14.MED)
- She said that their focus date is Feb. 25, 1998 and they've only been working on it 6 months but they've gotten a lot of input from a lot of teachers and they think they'll be ready by that time. (IV, 20, 2) (2.CURR) (4.CURR)
- There are seven chapters in [MAN's environmental education curriculum guide] and it's more or less to give teachers an idea of how to incorporate EE into the classroom. They have ideas like examples but they leave a lot of it up to the individual teachers as to how they teach it. For example, in Masaya they developed more of their EE on water because that's what they're the most worried about and they developed their own songs, social dramas and poems specific to the area of Masaya. They used the book as a guide but then they did their

own work. It also helps the teachers not to have such a rote learning system which a lot of the teachers have. They also instruct people on things you can do in the house to help the environment. (IV, 20, 5) (2.CURR) (4.CURR)

2.ECO = 60 mandated hours of ecological service (high school)

- One of the good things is that the government passed a law that high school students, in order to graduate, they have to donate 60 hours of their time to ecological social service. Must get involved with ecological activities and must get the permission of the Ministry of Health and Ministry of Education and approval of the institution. (II, 1, 8) (2.ECO) (XX)
- And, as far as the students are concerned, they have the 60 hours of environmental work, which I believe could really be taken advantage of by the community. (VI, 3, 4) (2.ECO) (XX)
- They also have the 60 hours that the kids are supposed to do. (VI, 3, 4) (2.ECO) (XX)
- “We had to go clean up trash.” But that’s not environmental education. They’re not getting any consciousness of what’s going on, they’re not learning anything about the environment or what its needs are and what their place in taking care of it is. They’re just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don’t even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 7) (2.ECO) (XX)
- Yeah, they have this 60 hours, they have this new environmental law but it’s not important to them because they don’t have one person set aside to make sure, on the departmental level they don’t. (VI, 3, 8) (2.ECO) (XX)
- . . . One of the two most important things they’re involved with as far as the environmental education theme or issue is the organization of the ecological brigades at the primary level and also the ecological social service that the students at the secondary level need that as a requisite to graduate. So that’s one of the most important things that [I think] are being imposed by the Ministry of Education. (I, 11, 2) (2.ECO) (2.BRIG; 8.K; 8.12)
- Right now the ministry is requiring 60 hours of community ecological high school work in order for students to graduate so volunteers are supporting the teachers to do environmental work in the community—using the high school. (VI, 13, 4) (2.ECO) (XX)
- In the national MED program, the majority of the focus is in the natural sciences. In the 4th grade the students study soil and water conservation. In the 6th grade they study 20 hours of

flora and fauna preservation, preservation of wildlife areas, water, soil, and air, and also learn about gardening. In secondary school the students in 5th year learn the general ideas of the environmental laws, and the basic concepts of environmental management. They have sections focused on ecosystems, relations between humans and ecosystems, and the 60 hours of ecological work in order to receive their bachelor's diplomas. (II, 16, 2) (2.ECO) (8.K, 8.12, 2.K12)

- This is for the educational 60 hours, that MARENA put out, and this is the guide for teachers on how to work on those 60 hours for teachers. It talks about the problems. This is how you would resolve the problems. These are your resources that you can use to help you to plan your 60 hours—this is for all of Nicaragua. This is showing, this is what they're supposed to be doing with their classes. They're supposed to be identifying problems with the students and making solutions. Like here it says that the principal problem is garbage, that the kids think it is. Then they write down what they think the effects of that problem would be then they plan solutions then they look at the resources they have to put together these solutions. This was put out by Jorge Luis Hernandez—who was with MED but is now with MARENA. (V, 23, 4) (2.ECO) (3.TNG; 14.MARENA)

2.HEA = health-related education

- In the past it was thought that MINSA was not responsible for this kind of education but now that they have been seeing that both types—as in education about public health and education about the environment—have a connection on the health of the people nearby. It was thought before to be the problem of MARENA but the vision has changed now and with this acknowledgment of the connection they are able to see that such things as contaminated rivers and garbage problems are the leading factors to their health problems. (II, 22, 1) (2.HEA) (14.MINSA; 14.MARENA)
- She said that, with health education, in every area, SILAS works within the communities—with talks within the communities—with speaker systems they have on the top of trucks, posters, announcements—in some communities it's more effective than in others. That's mainly because in some communities there's more emphasis or more health problems so they emphasize more in some communities than in other communities. (II, 22, 1) (2.HEA) (2.CAM; 14.MINSA)
- Environmental factors permit that mosquitoes can reproduce in higher quantities so these diseases are spread through environmental problems. One of their programs is a community

clean-up program where they try to emphasize in different departments, in different places that the people keep clean their houses, their yards, their community area to not have this problem with malaria and dengue. (II, 22, 2) (2.HEA) (XX)

- The second problem and they're working is a hygienic problem—keeping the community schools' food and everything adequately clean. This incorporates garbage problems, sources of contamination, problems with “agua negras”, places where mosquito larvae would grow. Then they have the malaria project which focuses on risk areas, giving adequate information on how to prevent the excess growth of mosquitoes. (II, 22, 2) (2.HEA) (XX)
- This is a study done by the doctor that is specializing in pesticides, this is the pesticide program [SILAS—part of MINSA] and it talks about the health status of the people who work in Plastinique, which is one of the biggest plants in Carazo. And this is what her study found on that part of contamination, in regards to health issues. (V, 23, 3) (2.HEA) (2.PEST; 14.MINSA)

2.INST = institutional strategy

- [Interviewer] You'll be having another conference this fall? [Subject] No, we'll have sectorial groups discussing around the strategy that their sector will have. [Interviewer] So, within each sector, they will come up with their own strategy and see how that fits in . . . [Subject] And the role they should play and awareness of EE for their sector, actions that they should do, and how all institutions should coordinate. [Interviewer] Sector meaning institutions not geographical areas? [Subject] Institutions . . . (I, 5, 8) (2.INST) (XX)
- This is the environmental commission, it's called COMARENA, of natural resources. It's based in Sta. Teresa in Carazo. This is their document for environmental education and this is their plan for Sta. Teresa—it's been formed for awhile. This is Sta. Teresa—Sta. Teresa is Chacocente's area and this is their plan, which is specifically for the turtles. This Thursday, supposedly, the commission will be getting together to re-do their document, this is an old document but he hasn't been that into what they've been doing lately. (V, 23, 3) (2.INST) (14.COMARENA)

2.K12 = K-12 program

- So if [ecological brigade] did activities, it was just within the school like putting up posters to clean up the school or cleaning up the school themselves or maybe planting some trees, but within the school grounds and within school hours. (VI, 3, 2) (2.K12) (XX)

- Formally, I would say that would be in the schools—supposedly they have 60 hours as part of their environmental education and what’s written up in the MED books. (VI, 3, 7) (2.K12) (XX)
- Laura and Jen [Peace Corps volunteers] can be effective because they’re working one on one with the teachers and that’s why a lot of people now are moving away from forestation projects and moving away from working with MARENA and the mayor’s offices and are working straight with the schools in the formal sector. Because they have the network set up and they have somebody that supposedly is responsible for it so like when you work with a teacher for two years teaching them how to incorporate environmental education into their work plan, then they have their work plan written up probably they’re going to continue using that work plan with the next year’s block. They’re going to see, they’re going to have worked out the games, they’re going to have worked up the activities, they’re going to see it’s easier for them with this all planned out, and that they can complete what MED has signed up for them. So I believe that those kind of people are going to be effective in their work in Peace Corps—the ones who are working directly with teachers because that’s the one that has a counterpart or a real person that that’s the teachers responsibility. They have to get that done and they’re interested in doing it or partially interested in doing it. (VI, 3, 9) (2.K12) (7.SCH; 7.STU)
- However, rangers [from Chacocente/La Flor] do go to local schools to give programs. (VI, 2, 6) (2.K12) (2.PK; 8.K; 8.12)
- And the second part of my job is promoting environmental education in the schools. (VI, 4, 3) (2.K12) (XX)
- From the beginning of preschool and primary school they address several issues and at those stages of the education curriculum, the students are taught how to separate and classify solid waste and so on and as they advance to the secondary level some other more complex issues are addressed like environmental pollution, loss of habitat and the loss of several species of flora and fauna. And that’s about the way they go about it—from the most simple things in the early school days to the most complex things as they go on to the secondary level. (I, 11, 3) (2.K12) (2.CURR; 8.K; 8.12)
- I work with 2 rural schools—they’re barrios or small communities right outside of Jinotepe. I work with 4th through 6th grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games

and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. (VI, 12, 2) (2.K12) (8.K; 8.TEACH; 7.LOC)

- Currently, we're working on an overpopulation analysis for the community. We're splitting the kids up into groups so that they can go around and ask questions such as, "How many people live in this house? How many people have died in a certain amount of years? How much firewood and water do you use per day?" etc. We're going to make a population growth rate chart. A separate group is going around and asking about the resources—how much land is there, how much water is there, how much water does the community use per year. Then we will discuss how much longer we can continue at the current population growth rate. (VI, 12, 3) (2.K12) (2.STU; 8.K)
- We're trying to get together themes like garbage, deforestation, overpopulation, an introduction to environmental science, ecosystems, animals, different appreciations for environmental problems—and coming up with different projects—mostly outside of the classroom—going for walks, thinking about the adaptations of different animals and plants. (VI, 12, 3) (2.K12) (8.K)
- Working with schools through an agreement with the Minister of Education (MED), we are working on supporting school primary school teachers, mainly in rural communities, to incorporate EE which is in the curriculum but is not always implemented. We are doing that in different regions, covering almost all populated Nicaraguan regions. There is a curriculum transformation right now from first to third grade so they are doing/promoting active education and local knowledge and we are working from first through sixth grade so not only including the first three grades who are working with MED but also the upper three grades (VI, 13, 3) (2.K12) (14.MED; 8.K)
- We started working with 3 schools—one volunteer works with three schools—we work from 4th through 6th grade—that way we cover the grades not covered by MED with the transformation in the curriculum so basically what the volunteers do is support the teachers to incorporate what in the curriculum into the classroom in a more active, using active methodology, using local knowledge from the students, and incorporating whatever environmental problems are happening and trying to find solutions where students can be involved. (VI, 13, 4) (2.K12) (2.TTNG; 8.K; 8.TEACH)
- At the beginning, during the first 6 or 7 months, they [Peace Corps volunteers] give talks directly to the students on different environmental topics like garbage, deforestation, topics that are important in their community. (VI, 13, 4) (2.K12) (9.WRK; 8.K; 1.SW; 1.DEF)

- Our principal users are the primary and secondary students from both urban and rural zones and we think it should be directed more towards the rural children because they are the future caretakers of the countryside. (IX, 14, 1) (2.K12) (8.K, 8.12)
- We made a mark for ourselves with the exhibit that allows the students to get to know the objectives of the museum. The students participate voluntarily. [It] explains the reasons why the museum stayed in this municipality. It asks the students to identify which are the principal environmental problems and where they come from and explains to them what the solutions can be and ultimately they learn to differentiate the different types of forests and their animal and plant species. (IX, 14, 2) (2.K12) (7.STU)
- FUNCOD has campaigns in schools such as seminars, presentations, as well as being a pioneer in the organization of ecology clubs since the 1980s, whose goals are to better the environment through reforestation. Example: the campaign to plant the national tree, which is on its way to extinction, and through this a project has been developed called “Protection and Conservation of National Species,” of which 12 [native tree species] are affected. (IV, 15, 2) (2.K12) (2.BRI, 2.REF)
- In the national MED program, the majority of the focus is in the natural sciences. In the 4th grade the students study soil and water conservation. In the 6th grade they study 20 hours of flora and fauna preservation, preservation of wildlife areas, water, soil, and air, and also learn about gardening. In secondary school the students in 5th year learn the general ideas of the environmental laws, and the basic concepts of environmental management. They have sections focused on ecosystems, relations between humans and ecosystems, and the 60 hours of ecological work in order to receive their bachelor’s diplomas. (II, 16, 2) (2.K12) (8.K, 8.12, 2.ECO)
- Their main work is to support programs in environmental education (EE), deforestation, watershed projects—any kind of project that’s going on in Carazo they support with their people or in whatever way they can support it. They do formulate some small projects in the area. She’s been working mainly with MARENA and me as far as EE and they’ve been focusing mainly on the schools. (V, 18, 1) (2.K12) (5.FUNCOD; 14.FUNCOD; 14.MAR)
- For the last six months, [MAN has] been focusing on education in the schools and they have started with workshops for the teachers. They’re trying to develop a guide book for teachers to use. They’ve been working with the schools that are supporters of MAN. It’s like a pilot project that has been working with the guide book for three years and they started with the

kids. The guide book is for the teachers and they've been using it in the schools for three years. (IV, 20, 1) (2.K12) (2.TTNG; 2.CURR; 8.TEACH)

- Meanwhile, [I've] been giving talks and workshops in schools on environmental education, as an individual, even though [I'm] supposed to be working with [Jinotepe's] whole [environmental education] commission. (V, 23, 3) (2.K12) (XX)

2.MUS = museum education program

- They [ADECA] built the museum. (VI, 3, 6) (2.MUS) (XX)

2.NATL = national strategy

- So, that's one thing we [MARENA] are doing and the other is creating a national EE strategy for Nicaragua—we're working on that. (I, 5, 3) (2.NATL) (XX)
- Three things we're working on: a strategy, the pilot program and a campaign that we are trying to design for the next four months but we don't have enough money so I don't know if we'll be able to do the campaign that we're trying to do. (I, 5, 3) (2.NATL) (2.CAM; 6.\$)
- This strategic plan you mentioned, is that for all of Nicaragua? V: Yes, it is a reference. It is a framework for the nation, for everybody, but it just a reference because we think that each department should make their own EE strategy based on their own problems using this reference of framework. (I, 5, 3) (2.NATL) (XX)
- That was the beginning—we started with the local and national meetings. We started to finalize the strategic document I was talking about. (I, 5, 6) (2.NATL) (XX)
- I was reading documents on the conference on environmental education from last October... no, not last October but the October or November from a year ago. VB/SE: November, no December of 1996... NA: Right, and it sounds like a lot of the information in the strategic plan came from that meeting. And at that meeting you had representatives from all the departments to come together to determine environmental problems and important actions. (I, 6, 2) (2.NATL) (2.CONF)
- [Interviewer] So, from the information from this conference, you're using that to put together your strategic plan. [Subject] Yes, but so far we are not happy with the document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. [Interviewer] And the parts of the strategic plan, they're addressing which areas of environmental education? [Interviewer] Formal education, non-formal education and informal education—to teach the strategy that

tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (2.NATL) (8.K; 8.12; 8.COMM; 8.UNIV; 8.MD)

- First of all, MARENA has with its ministry an institution especially designed to work in the area of environmental education at a national level. (I, 8, 1) (2.NATL) (XX)

2.PAR = parade

- It was more or less something on paper—or something the kids, like when there was a parade, they would participate in the parade as the Ecological Brigade. (VI, 3, 2) (2.PAR) (XX)
- They want a big parade, a big campaign, they want a one-time blurb, and that's what they also see as environmental education. You know, Plan Playa is that clean-up, the Easter weekend clean-up. And it goes great, people yell at each other for throwing their garbage on the ground at the beach, and they say, "See, haven't you listened to the kids?" It's this big campaign, but it's only a week and then everybody goes back home and throws it in their backyard or on the streets. And for a short time it's a success,(VI, 3, 7) (2.PAR) (XX)
- They also participate in several parades that they have organized. They have parades in the street where they display ecological activities and promote ecological actions for the citizens to do and that's about it. (VII, 10, 3) (2.PAR) (XX)
- Just the fact that they go out on parades with bands and display signs with things that citizens should do like the importance of managing solid waste properly and not to pollute the streets, don't throw things on the streets, the importance of environmental education—that has the effect of making some people conscious of the problem. (VII, 10, 3) (2.PAR) (XX)

2.PEST = education about wise use of pesticides and pesticide safety

- Another program they have is with pesticide use. They're trying to train the different aspects, the different people that would be involved with pesticides to be conscious of the different pesticides and their dangers. She said that they work more with the producers explaining the toxic possibilities of pesticides and how to limit poisoning themselves and the area that they are working in—and especially if it is close to a population. They also work with themselves as they do spray for mosquitoes and different things so they work with their own people talking about the dangers of these pesticides that they're using on the community and how to use them properly. They work with teachers and students to change the ideas and

concepts about indiscriminate use of pesticides. A lot of people just use them in their house to kill different animals and they don't think about the dangers of using these pesticides. They also work with those that sell pesticides—the buyers and sellers. Mainly to describe what chemicals are being used—how they can hurt you, how you can get poisoned—kind of general education so that they're not using them wrong. (II, 22, 2) (2.PEST) (2.TEC)

- She said that four years ago they started training medical staff to reproduce what they had learned in the field of pesticides in educational materials. They're using them to change the values and customs of people in their use of pesticides. That's where they've mainly focused themselves and over two or three years of the training they've come up with 30 to 40 types of resources over the indiscriminate use of poisons. (II, 22, 2) (2.PEST) (4.EXP)
- This is a study done by the doctor that is specializing in pesticides, this is the pesticide program [SILAS—part of MINSA] and it talks about the health status of the people who work in Plastinique, which is one of the biggest plants in Carazo. And this is what her study found on that part of contamination, in regards to health issues. (V, 23, 3) (2.PEST) (2.HEA; 14.MINSA)

2.PK = visit to/interpretive program at park or natural area

- At Volcan Masaya, they see schools almost every day. Usual visitation rate per day is about 300 students although some days it is as high as 800. Some trips are pre-planned while others just show up—the cost is a bit higher for schools who show up when they're not on the schedule. Have a big schedule so it is rather well planned out which schools are coming on what days. Pretty well set in the way they deal with school groups—the kids arrive and sit down for a 15 minute talk from a ranger about volcano ecology and the park. They then receive a guided tour through the visitors center with the ranger explaining a bit about each exhibit—quality varies with the ranger. Some are very good and know a lot about the park. If requested, shown a 20 minute slide show about the park—pretty well done. Then go walk around the crater area or have a guided tour through the lava caves. (VI, 2, 6) (2.PK) (8.K; 8.12)
- However, this is not typical. For example, in the Chacocente/La Flor protected area visits to protected area only from local schools because there isn't much capacity for school groups—[there's] no real visitors center or formal school programs at most other parks/protected areas besides Volcan Masaya. (VI, 2, 6) (2.PK) (2.K12; 8.K; 8.12)

2.RAD = radio program

- I'm not familiar with the math program but there are a few environmental radio programs—like the environmental hour hosted by Humberto Campos. (3NC, 9) (2.RAD) (XX)
- [I'm] also the director of "Radio Magazine," which plays on a station in Managua and another station here in Carazo, so [I'm] the director of that. It's an agriculture and animal husbandry show. (V, 23, 7) (2.RAD) (XX)
- [The radio show] is an agricultural show so they do a lot of what is conservation of soil and water and natural fertilizers—things that are going to help the producers. Agroforestry—they get some information on economics on how much things cost—to help the producers know these facts before they go to the markets so that they're not losing money or being lied to. They also do environmental education, which is really amplified—they invite organizations that are working in environmental projects to talk about their projects or they invite MARENA to talk about what they're doing. They talk about fisheries . . . all kinds of topics are covered as well as environmental education. It's more of a motivator and informer than used for training. (V, 23, 10) (2.RAD) (XX)
- It's mostly for producers but he's personally been trying to put more of environmental education issues into the program so they try to focus at least 10 to 15 minutes weekly on environmental issues, which are also picked up by the TV stations and general population. (V, 23, 10) (2.RAD) (XX)
- There's a group that does a radio show in the morning here in Jinotepe—put on by students from Jinotepe and his name is Samir Baneza (student at UCA in his second year of ecological studies) (V, 23, 10) (2.RAD) (XX)

2.REC = recycling

- . . . and we're trying to do this recycling, like you do here on those boy scout paper drives; there is a paper recycling plant in Granada. (II, 1, 7) (2.REC) (XX)

2.REF = reforestation

- In Diriamba, I came to help start tree nurseries for a reforestation project that the mayor's office was supposed to be sponsoring. (VI, 3, 1) (2.REF) (XX)
- The mayor's office was to take it over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone

have anyone who had any idea what was going on with the tree nursery. (VI, 3, 1) (2.REF) (XX)

- Like they did set up two tree nurseries that have run successfully for a year and then after that, that's it. So I could say that they've been effective in that they've gotten so many trees planted or so many trees grown, (VI, 3, 6) (2.REF) (XX)
- POSAF's a five year project, they work on forests for five years and then they're done. (VI, 3, 8) (2.REF) (XX)
- POSAF-Carazo focuses on the management and recovery of natural resources, which includes projects in agroforestry, silvopastoral, and reforestation. At this moment, POSAF is working in cooperation with the different mayors' offices in reforestation projects. (V, 7, 1) (2.REF) (XX)
- And also they have some kind of projects on planting trees in different areas of the city, around the school, like some type of landscape work and establish some gardens in several places like the entrance to Diriamba and the exit of Diriamba to the south and they try to plant trees on the road and various places so they're doing like an urban type of reforestation. (VII, 10, 2) (2.REF) (XX)
- Some of the seniors who are just getting ready to graduate from high school, they have put a fence around the trees around the area and they have planted about 2,000 trees (VII, 10, 2) (2.REF) (2.TREE; 2.SCH; 6.SCH)
- FUNCOD has campaigns in schools such as seminars, presentations, as well as being a pioneer in the organization of ecology clubs since the 1980s, whose goals are to better the environment through reforestation. Example: the campaign to plant the national tree, which is on its way to extinction, and through this a project has been developed called "Protection and Conservation of National Species," of which 12 [native tree species] are affected. (IV, 15, 2) (2.REF) (2.BRI, 2.K12)
- MED works with . . . MARENA on the ecological brigades and their reforestation and clean-up plans. (II, 16, 1) (2.REF) (14.MED, 14.MARENA, 2.TRAS)
- They have another small project which is to reforest the road between San Marcos and Jinotepe. They decided to start on this area also because each year they have a religious festival—called the "Tope" when the three saints come together. There are people from all over—especially a lot of warmer areas—from Managua or areas where it is a lot hotter. It is in April that they have the festival so this area isn't very shaded because there's not a lot of trees. So, they're hoping with the shade trees to have a better recreation spot and to have

people enjoy what they're doing. He said that they don't want to spread themselves too thin on their projects so they're starting small and going from there. (III, 17, 2) (2.REF) (XX)

- They're also on a reforestation project of Rio Dulce Nombre. On Saturdays, the students and the commission go out into the area and they do interviews. They're trying to think of an EE plan to work with the population to find a way to clean up the river area. (III, 17, 2) (2.REF) (8.12; 8.CMS; 7.COM)
- He said as far as the deforestation problem, they also have in the schools Ecological Brigades that have been working right out front—they work every day. Different school children come in and work. And in the month of September they hope to have a reforestation plan for the urban areas of Jinotepe—for the entrance and exit part of Jinotepe, the cemetery and the parks. (III, 21, 1) (2.REF) (2.ECO)
- He said that they have been receiving a lot of help from POSAF. They're the ones that have been helping with a reforestation plan for Jinotepe. They have large projects for reforestation and their goal is to reforest the watershed area of the Rio Grande. (III, 21, 2) (2.REF) (14.POSAF)
- [The Jinotepe mayor's office has] also been getting help from CECOTROPIC. They help the small producers with financing for planting basic crops and for reforestation. (III, 21, 2) (2.REF) (2.TEC; 14.CEC; 5.CEC)
- It was done by an informal agreement—[I] went in and told them what [I] was doing and then they asked [me] to do something but now [I don't] have much time so he goes by every 15 days and checks with them—[I'm] now like a technical advisor. They reforested their school area and they also planted some fruit trees and stuff around the male dormitories. (V, 23, 8) (2.REF) (2.TTNG; 2.TEC)

2.SCH = clean up/improvement on school grounds

- So if [the ecological brigade] did activities, it was just within the school like putting up posters to clean up the school or cleaning up the school themselves or maybe planting some trees, but within the school grounds and within school hours. (VI, 3, 2) (2.SCH) (XX)
- In the trash charlas they have games between different groups, classifying trash and stuff. We try to put it into practice in the schools. Like in Arlen Siu, for our trash program, we're going to dig two big holes basically, and we're going to deposit organic trash in one and inorganic in the other. (VI, 4, 4) (2.SCH) (2.TRAS; 8.K)

- Some of the seniors who are just getting ready to graduate from high school, they have put a fence around the trees around the area and they have planted about 2,000 trees (VII, 10, 2) (2.SCH) (2.TREE; 2.REF; 6.SCH)
- She's responsible of a certain area of the ecological activities of the school and so she had the support of some other teachers in the school and they have like a special kind of banner and they give her an award to the school room that is cleaner so they promote the activities to clean the school and once a month they give the special banner, the "banner ecologica," so they have been promoting that. (10, EP) (2.SCH) (6.SCH)

2.SOL = solar ovens

- We started with Peace Corps (with Vonda) and the Finland development organization promoting the use of the cocina solar (solar oven) which is a type of kitchen that uses firewood more efficiently; had a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives; at that seminar, we actually built those cocinas and solar ovens. (II, 1, 7) (2.SOL) (XX)
- I started this solar ovens project—kind of as a secondary project—something to keep me busy and people had an interest in learning about it. (VI, 3, 2) (2.SOL) (XX)
- Yes, the first year I worked with the guy from Finland on it and we contacted a few people, like a few communities Like we had a few demonstrations for the press and they took pictures for the newspaper and stuff and a few people that were at these demonstrations with the press said that their neighborhoods would be interested so we went and gave free demonstrations in the neighborhoods and we took lists of people that would like to go to a workshop. And then we held workshops. And then the second year, we were full with people calling us and asking us to come and give a workshop to a group of people that they had organized. (VI, 3, 3) (2.SOL) (XX)
- Actually, we've never done any study on who has carried through using them. I suspect the number is pretty low because it is a big change. And when I first started the project, a lot of people asked me, "This project, you know, I think it would be better to put your energies to something that people would use." But I figured that if people are interested in learning about it and it's some kind of knowledge that I know, and they're interested enough to organize themselves, I'll teach it to them and then if they're going to use it tomorrow or maybe use it three years down the road, at least they'll have the knowledge and they have an alternative. It's going to be their decision what they do, if they're going to want to use it as

an alternative to firewood. So, I don't know, it would be interesting to see how many have used the ovens but I don't know of any right now, to be honest. I know of many that have built them and many organizations that have them and are promoting it further but I don't know of any individuals that are using them. (VI, 3, 3) (2.SOL) (XX)

2.STU = study

- La Flor = Qualitative study to identify beliefs of target audiences; this information was used to develop belief-based messages for educational materials. Quantitative evaluation will be implemented to determine impact of materials on knowledge, beliefs, and intentions to engage in specific behaviors related to sea turtle conservation. (VI, 2, 3) (2.STU) (XX)
- Volcan Masaya = A one year visitors study is being implemented to provide baseline in visitor demographics and determine visitor satisfaction with interpretive materials and services and qualitatively determine changes in satisfaction as a result of any new materials or interpretive services implemented as part of GreenCOM. (VI, 2, 3) (2.STU) (XX)
- Another one of our major components is a visitor's study at Volcan Masaya National Park. We're implementing a visitor services survey in order to define visitor characteristics to Volcan Masaya National Park. Created a survey which will be administered by a local-hire assistant over the next 9 months. Describing where the visitors are from, length of stay in the park, how many times they have been to the park, what kind of information and interpretation they received, and their satisfaction with the experience. (Provided copy of survey in English and Spanish). Once the results are back and tabulated, hoping to use them to improve the quality of visit to Volcan Masaya. Will work to design interpretive programs and services according to the visitor needs. (VI, 2, 5) (2.STU) (8.COM)
- We're also doing social research in the Chacocente/La Flor region. Chacocente Wildlife Refuge is a protected area located in Carazo. We're working with the local protected area staff to assess behaviors regarding the turtle beaches—why people are taking eggs, what the belief system is behind it, what the attitudes are and then working with park personnel to create an education campaign to specifically address (and possibly change) these behaviors—using personal interviews and a quantitative survey. Educational materials will be evaluated three months after implementation. Research design created by GreenCOM with involvement by local people and protected area personnel but research itself being conducted by an independent local contractor. (VI, 2, 5) (2.STU) (8.COM)

- Currently, we're working on an overpopulation analysis for the community. We're splitting the kids up into groups so that they can go around and ask questions such as, "How many people live in this house? How many people have died in a certain amount of years? How much firewood and water do you use per day?" etc. We're going to make a population growth rate chart. A separate group is going around and asking about the resources—how much land is there, how much water is there, how much water does the community use per year. Then we will discuss how much longer we can continue at the current population growth rate. (VI, 12, 3) (2.STU) (2.K12; 8.K)
- Also, in Carazo, [UNA] was working on this study about the natural resources in Rio Grande. We have all this information. (VIII, 19, 3) (2.STU) (XX)
- They are in a national coordination of NGOs where each NGO has their job—some work in only reforestation—others work in only certain areas . . . FUNCOD is in EE but they work in the informal sector. They work with the National University of Engineering with the measurement of how many gases are in the air. (IV, 20, 4) (2.STU) (14.FUN)
- This is also [a study done] on pesticides and it talks about, in our department, how many people have been intoxicated by pesticides and have had to go to the hospital and this is between 1995 and 1996. SILAS is part of the Ministry of Health. (V, 23, 4) (2.STU) (14.MINSA)
- [I have] a friend that works in Project HOPE that did a study for health on the different dump sites and problems with the environment and [I] could get you information from that. (V, 23, 6) (2.STU) (XX)

2.SW = solid waste management programs

- Some of the counties are trying to do something; Santa Theresa is already building a landfill. (II, 1, 7)
- The second program in the works is the "fosa" or "pila septica." It's just kind of a big hole with sand in the bottom of it—it doesn't sound too technical and it really isn't. You just dig a big hole and throw some different grades of sand in it and that's where they're going to throw the contaminated water instead of throwing it in the street. The pilas will reduce the volume of standing, contaminated water. (VI, 4, 5) (2.SW) (1.GRAY)
- With the pila septica—the holes for the dirty water. We've already given the charlas [talks] to the brigade and the brigade is going to teach the people how to do it in small groups. They're going to pick small groups of people that need them and then they're going to work

together and build one in one patio and then go the next patio and build one. You have to get the people involved. It's kind of missing the point if you don't have them involved—if you tell them the Alcaldia [mayor's office] has donated materials and this organization has donated this and this organization has donated that so we're going through these holes in the ground for you—please throw your dirty water in it. It just doesn't mean as much as them going out there and actually making the hole and putting it in there and understanding what it's for, understanding how it works. (VI, 4, 10) (2.SW) (8.K; 8.COMM; 7.LOC)

2.TEC = technical assistance program

- Usual activities [of MARENA technicians] include giving permission to cut down trees for commercial, domestic, energy uses. There is now a new law now that says that in order to get permission to cut trees, a management plan must be presented to plant trees in area affected by cutting and they must establish management activities to promote natural re-growth of trees. (II, 1, 2) (2.TEC) (XX)
- (N) These activities focus on which parts of agroforestry? Is it sustainable forestry practices, organic farming... or...? S: All these things, and soil conservation, vermiculture—whatever has to do with sustainable development. (II, 1, 7) (2.TEC) (XX)
- (PROSESEUR) have emphasized that they will work in agroforestry and organic agriculture and soil and water conservation. (II, 1, 9) (2.TEC) (XX)
- Unfortunately, I see mostly either volunteers or cooperantes, which are from other countries, being effective, like in technical assistance, mainly because they're getting, they have their job as mainly that. (VI, 3, 6) (2.TEC) (XX)
- To say which organizations are doing environmental education, it really depends on your definition of EE. Many organizations are doing what we would call extension kind of work such as working with campesinos on soil conservation, tree planting, farming techniques, organic agriculture. (VI, 2, 8) (2.TEC) (XX)
- POSAF finances organizations to work with groups of producers within the following areas: Agroforestry, in which we only finance organic farming—nothing with chemicals. In silvopastoral, we give financing to better pasture land but not to buy more cattle. POSAF provides a 30 to 60 percent incentive to the producer, depending on their case. (V, 7, 1) (2.TEC) (5.POSAF)
- We also work in non-formal education through the agricultural producers. That component of our program is a lot smaller than EE—the only reason for that is that it is very difficult to

find organized groups of farmers where we can target and work very efficiently with them so at the beginning of this program (2 years old) we started with half of the volunteers working in formal and half in non-formal. (VI, 13, 5) (2.TEC) (8.AG; 6.COORD)

- For example, he said the students from Juan XXIII won the national contest last year with a paper and research on how to save the water source that we talked about earlier. It was applauded by a lot of organizations and groups but wrote up a mini-project but they haven't gotten an answer as far as where their funds are coming from to do it. They are looking for materials to start the project around here. They had thought about planting some trees but since the rains haven't started yet they haven't started with that and they're waiting for winter to set in so that they can have the trees in a stable state. (III, 17, 2) (2.STU) (7.STU)
- Right now they're in the process of a study to reserve the water source we talked about earlier. They haven't received any money to start this projects but they have started working with the students to clean this area. (III, 17, 2) (2.STU) (XX)
- He said that three things that he wanted to say. Most of them go in and they support an institution that is working with the producers. The students aren't there for a long period of time because of the cost and the time so they only stay for a short period of time. They do work some directly with the producers and in crop management. (VIII, 19, 2) (2.TEC) (4.UNIV)
- For example, some people who are working with the forestry, they know about nurseries and they can do something to change the technical way to lead the class and try to prepare a very easy and understandable paper or pamphlet to go to the people. In this proposal, we set out a diagnosis of the problems in this area in order to develop the government for the children because we were working to the families too in order that they will see these environmental problems and relate to them. (VIII, 19, 2) (2.TEC) (7.COM)
- From this participation [in a practicum in the field] of the students, now we have a proposal for a project where the students will go another five weeks—but this is extra pay—they will train the students to make an evaluation of the forestry system that they have and do an evaluation of the area's agriculture and after they will prepare a report. It is possible to have some help from the people. They like to work with the university and of course it is the cheapest labor. To me, it is possible for the students to do something and present something. (VIII, 19, 3) (2.TEC) (11.YOU; 2.UNIV)

- [The Jinotepe mayor's office has] also been getting help from CECOTROPIC. They help the small producers with financing for planting basic crops and for reforestation. (III, 21, 2) (2.TEC) (14.CEC; 2.REF; 5.CEC)
- Another program they have is with pesticide use. They're trying to train the different aspects, the different people that would be involved with pesticides to be conscious of the different pesticides and their dangers. She said that they work more with the producers explaining the toxic possibilities of pesticides and how to limit poisoning themselves and the area that they are working in—and especially if it is close to a population. They also work with themselves as they do spray for mosquitoes and different things so they work with their own people talking about the dangers of these pesticides that they're using on the community and how to use them properly. They work with teachers and students to change the ideas and concepts about indiscriminate use of pesticides. A lot of people just use them in their house to kill different animals and they don't think about the dangers of using these pesticides. They also work with those that sell pesticides—the buyers and sellers. Mainly to describe what chemicals are being used—how they can hurt you, how you can get poisoned—kind of general education so that they're not using them wrong. (II, 22, 2) (2.TEC) (2.PEST)
- He said that it was done by an informal agreement—that he went in and told him what he was doing and then they asked him to do something but now he doesn't have much time so he goes by every 15 days and checks with them—he's now like a technical advisor. They reforested their school area and they also planted some fruit trees and stuff around the male dormitories. (V, 23, 8) (2.TEC) (2.REF; 2.TTNG)

2.TNG = interpretive training in parks

- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period in which they put these ideas into practice, for example, for the next *ten weeks* they are writing interpretive plans for each protected area and identifying *one* project in the plan to produce. The same participants, in teams, come back for a second week-long workshop to learn about design techniques and to create a mock-up of the materials they want to produce. (VI, 2, 2) (2.TNG) (XX)

- [I] took part in a special training that was given to 500 people who were going to act as tour guides at Volcan Masaya National Park. (VII, 10, 1) (2.TNG) (XX)

2.TRAS = trash clean up (not on school grounds)

- In the trash charlas they have games between different groups, classifying trash and stuff. We try to put it into practice in the schools. Like in Arlen Siu, for our trash program, we're going to dig two big holes basically, and we're going to deposit organic trash in one and inorganic in the other. (VI, 4, 4) (2.TRAS) (2.SCH; 8.K)
- The way it stands right now on the itinerary, the Ecological Brigades are going door to door and explaining how to separate organic and inorganic trash and explaining that trash collection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the Alcaldia is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (2.TRAS) (2.COMP; 2.BRIG; 8.12; 8.COMM; 14.ALC)
- For example, during Easter week, young people [in the Ecological Brigades] work on the heavily visited beach areas educating vacationers and residents to keep the waters and beach itself clear of garbage. (I, 8, 1) (2.TRAS) (2.CAM)
- They're working on what's called the Plan Playa, which is the type of project that takes place during the summer vacations and the brigades go to the different beach resorts around the area, around here on the coast, and they try to train the tourists to help manage the waste—not to throw it on the beaches. The activities that they develop—picking up the waste and all that. They also give talks to the different people that are there—telling them about the negative effects of throwing the waste on beaches. (VII, 10, 2) (2.TRAS) (2.CAM)
- They [boy/girl scouts] do some community service and work but it depends on different communities—they do environmental projects more like campaigns like collecting garbage or something like that. There are two different groups—one is the ecological brigades that were organized through the mayor's office at the beginning then MARENA took them over. Then there are the 4H groups—started through the Nicaragua Institute for Agricultural Extension. This is something taken from the United States—4H but here it is called 4S. They are planning to focus on training youth groups to work on agricultural projects. So, Ecological Brigades and 4S are the ones I know (VI, 13, 5) (2.TRAS) (2.CAM; 12.SCO; 14.MARENA; 12.4S)

- MED works with . . . MARENA on the ecological brigades and their reforestation and clean-up plans. (II, 16, 1) (2.TRAS) (14.MED, 2.REF, 14.MARENA)

2.TREE = tree nursery

- In Diriamba, I came to help start tree nurseries for a reforestation project that the mayor's office was supposed to be sponsoring. (VI, 3, 1) (2.TREE) (XX)
- The mayor's office was to take it over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone have anyone who had any idea what was going on with the tree nursery. (VI, 3, 1) (2.TREE) (XX)
- Like they did set up two tree nurseries that have run successfully for a year and then after that, that's it. So I could say that they've been effective in that they've gotten so many trees planted or so many trees grown . . . (VI, 3, 6) (2.TREE) (XX)
- You have to start really small and build up—a lot of it is trying to improve upon the existing structures that are here. Like, people drove me crazy because they wanted to have [tree nurseries] in the school and they asked “Okay, who's going to buy the seeds?” and I said, “Nobody's going to buy the seeds, we're going to collect seeds like they used to do in the days of the Indians—we're just going to pull them off of the tree when they have seeds.” “Well, who's going to buy this, who's going to buy that, who's going to buy the land?” “Nobody is going to buy the land—we're going to find people who are going to donate it.” The best programs are the ones that make people find their own resources and the time. (VI, 4, 11) (2.TREE) (XX)
- Quality education with the forest that was established there with the assistance of MARENA and some funds that were obtained by some organizations from Germany and also the nursery that was established there which has 35,000 or 30,000 trees (VII, 10, 2) (2.TREE) (5.GER; 5.MARENA)
- Some of the seniors who are just getting ready to graduate from high school, they have put a fence around the trees around the area and they have planted about 2,000 trees (VII, 10, 2) (2.TREE) (2.REF; 2.SCH; 6.SCH)
- We are basically promoting school nurseries using fruit trees and fuel trees and we are promoting a lot of fruit trees, trying to show the students that, if they would like to have fruits, they can grow them. They bring the seeds from their houses like mangoes or whatever is available and they have one or two plants and they use local resources and there

are milk bags we use instead of buying plastic bags. In other places, we just have the nurseries without having bags so they will learn how to have the trees and how to grow them. (VI, 13, 4) (2.TREE) (8.K)

- He said that, to be honest, he thinks that as a group MOPAFMA doesn't really exist in Carazo. It's really just one person. Mostly they just supply bags and seeds to that people can start tree nurseries. They don't have their own offices and don't have their own tree nurseries. He said that they have helped establish nurseries and one of them is in an area called Santa Teresa, another town in Carazo, and they started a tree nursery there of 200,000 plants but they didn't watch it very closely. It started with the mayor's office. But now they've all grown too big—too big to be planted—past where they could be replanted and that's a problem. He doesn't understand exactly what went wrong with that project. It was meant to be for the small producers of the area to use. (V, 23, 2) (2.TREE) (14.MOPAFMA)
- They have another nursery—it's before the little bridge in El Rosario and he said he's not sure how many plants they have there but it's not really *their* nursery—they help facilitate it. (V, 23, 2) (14.MOPAFMA) (2.TREE)

2.TTNG = teacher training

- So, before each school year and what I've heard that they've done is a lot of ... they don't have anything really well planned. They just kind of meet ... they get together and they talk. And those two weeks could really be taken advantage of by using them to give maybe a two day workshop on how to incorporate environmental topics in the different classroom issues and how to use their guidebook that they do have by MED and the environmental issues they're supposed to cover. (VI, 3, 4) (2.TTNG) (XX)
- So, they have the structure in formal education to have a good environmental education project, with the set aside time at the beginning of each year, I believe they also have it at the beginning of each semester for teacher training. (VI, 3, 4) (2.TTNG) (XX)
- I'll tell you what the teachers really like. They really like the teacher in-service trainings where an outside organization gives them and pays for it. They got into a big fight with MED because when they had the one in July, they said they were supposed to get more money to cover transportation and food . . . (VI, 4, 7) (2.TTNG) (9.INS; 11.TNG)
- So the teachers get money from MED to cover those things? JB: Yes, and they were up in arms about it because it wasn't variable. They were coming from all different areas but they all got paid the same and most of them ended up trying to race home for an hour to eat lunch

because they didn't want to pay to eat a meal there. That seems to be more effective if an in-service training like that were kind of like you'd present the materials to them and say "This is how you do it" and it won't be 100% effective—that's kind of one of the frustrations of working here. (VI, 4, 8) (2.TTNG) (6.\$)

- Then we're going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade—so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas. (VI, 12, 3) (2.TTNG) (9.WRK; 8.TEACH)
- I think, in the Escuela Normale [normal school], they should incorporate teaching about the environment. I think they're doing that right now—they're teaching teachers how to raise tree nurseries, how to do composting—but I don't know if they're teaching about how to think about how animals adapt or how to make up experiments or do investigations of any kind. But it would be a good idea to teach how to encourage students to think for themselves. I think labs should be required in primary and secondary schools and a science fair could be implemented into the program. (VI, 12, 5) (2.TTNG) (8.TEACH; 11.PRE)
- In different courses, they start with natural science and have moved on to other courses and there are specific topics about the environment. What happened is that teachers don't receive the proper training so we are working on that, starting with natural science. (VI, 13, 3) (2.TTNG) (8.TEACH)
- We started working with 3 schools—one volunteer works with three schools—we work from 4th through 6th grade—that way we cover the grades not covered by MED with the transformation in the curriculum so basically what the volunteers do is support the teachers to incorporate what in the curriculum into the classroom in a more active, using active methodology, using local knowledge from the students, and incorporating whatever environmental problems are happening and trying to find solutions where students can be involved. (VI, 13, 4) (2.TTNG) (2.K12; 8.K; 8.TEACH)
- After 7 months, when the teacher is aware that the dynamics are good—when they realize that the students remember better what they do rather than what they memorize and that they are using their creativity and local knowledge—they agree to start working with the volunteer in a planning process using the Nicaraguan curriculum. how to incorporate dynamics in those topics. The second year of the volunteer service, the teacher will do the dynamics—at least once every week and the volunteers will support the teachers and help them. Teachers will lose or gain confidence in using dynamics in some activities and other

- classroom activities—using their curriculum because they don't want to spend time using other topics that are not covered by the curriculum (VI, 13, 4) (2.TTNG) (8.TEACH)
- For example, this was a training that was sponsored by a volunteer, she did from 4 to 6 grade for example two days of the week and then gave out the manual. (VI, 13, 10) (2.TTNG) (4.CURR)
 - So what the teachers do right now, the volunteer explains to the teachers using paper on the wall summarizing the dynamic, they do it and they write it down with notes—what grades, how to do it, etc. We start doing that with 2 hours using MED training at the beginning of each year in February, for example. (VI, 13, 10) (2.TTNG) (9.INS; 8.TEACH)
 - The way we are approaching it is to explain to the teachers that volunteers are here to support them— not to give more work but to help them by doing a more active class, by giving them a more active class is less work for them and in the long term students have a better long term understanding and better results, even in grades, because they remember longer. Because teachers feel that you have to prepare a lot to do these things with your class, the volunteer has to explain it's just thinking about what to do and using local materials like the same pens and papers they have and more imagination. Also, we work with the teachers that want to work with the volunteers. The ones that are not that enthusiastic, we just leave them alone and we'll come back to them later. This is also adult education, teaching to the teachers, and we know that we don't learn just by receiving information—we have to do it. After 7 months of watching the volunteers and seeing the results, the teachers realize that the students remember more what the volunteer is teaching and doing than what the teacher is doing so that's when we've convinced them—just by seeing it in the classroom. (VI, 13, 12) (2.TTNG) (8.TEACH; 9.DEM)
 - We have a time every year where the teacher participate in workshops and talks. Sometimes the NGOs give talks or the MED or other ministries. (II, 16, 2) (2.TTNG) (XX)
 - For the last six months, [MAN has] been focusing on education in the schools and they have started with workshops for the teachers. They're trying to develop a guide book for teachers to use. They've been working with the schools that are supporters of MAN. It's like a pilot project that has been working with the guide book for three years and they started with the kids. The guide book is for the teachers and they've been using it in the schools for three years. (IV, 20, 1) (2.TTNG) (2.K12; 2.CURR; 8.TEACH)
 - She'll show you the guide book afterwards but what they've been doing the last six months is they've been doing nation-wide workshops with teachers—using the guidebooks and

trying to develop it better—trying to find out their inputs on it—if they want to have drawings or changes. (IV, 20, 2) (2.TTNG) (9.WRK)

- She said that [MAN has] had 8 workshops and they know that isn't very many but they had some basic goals before they went into the workshops. They wanted to have them in areas where MAN was already present and also they wanted to make sure that the professors and school district had interest in the project. She wanted to make sure that all the professors were volunteers because she was saying that they don't get paid very much so she didn't want to make it requisite that they participate in those workshops so that they're all volunteers. She wants to make sure that they have a lot of interest and that they like it. They have had the most success in the Masaya region where they have done 3 workshops in 44 schools. She finds that they have a lot of interest because they have a laguna there and they have a lot of "agua negras"—polluted waters. So, they've had a lot of interest in the Masaya area. They have done some in Puerto Sandino—another area—but there they just gave their ideas and that was it. They've also done some in the Matagalpa but they found that they've gotten the most support in Masaya. (IV, 20, 3) (2.TTNG) (9.WRK; 7.TEACH)
- Last year, he was working mainly in the schools—he worked in the Normal school, which is the teacher training school, and they work there because the teachers are going to be trained and they want them to . . . the multiplier effect. They worked with tree nurseries, they worked in deforestation, they worked a little bit in natural fertilizers and some in gardening. He worked with them in about six months and it was mainly done in the form of talks with teachers, and this is another thing that CECOTROPIC is doing. (V, 23, 7) (2.TTNG) (XX)
- . . . [I believe] it's a really good resource to do the teaching there with the teachers and the students but a lot of people don't feel that that's that important and, right at the moment [CECOTROPIC and MED] don't have a lot of money to do these programs at the Normal. (V, 23, 7) (2.TTNG) (6.\$)
- It was done by an informal agreement—[I] went in and told them what [I] was doing and then they asked [me] to do something but now [I don't] have much time so he goes by every 15 days and checks with them—[I'm] now like a technical advisor. They reforested their school area and they also planted some fruit trees and stuff around the male dormitories. (V, 23, 8) (2.TTNG) (2.TEC; 2.REF)

2.UNIV = university level program

- Francisco Salmeron, UNA, has an agreement with a Swedish university, professors from the university do their postgraduate work with this university; they do their research in Nicaragua and go and do paperwork and analysis in Sweden (II, 1, 11) (2.UNIV) (XX)
- [Interviewer] Within Nicaragua, are there any universities that have EE as a degree or major? [Subject] No, but you find that in courses like “National Parks and Protected Areas”, we use a lot of techniques from interpretation so in those there is an EE component but not like a course and seeing the different aspects—formal, non-formal, informal education, etc. (VI, 13, 8) (2.UNIV) (8.UNIV)
- [Interviewer] Which university would you say focuses the most on EE? If there were someone interested in EE, would they major in education and take science classes or would they major in science and take education classes? [Subject] I’ll take something back, the UNAN, the national university which is the public one, they have a bachelor’s degree focusing on biology for teaching so they receive the more formal education and a lot of them are working as teachers. They focus more on education than on regular sciences. (VI, 13, 8) (2.UNIV) (8.UNIV)
- His position here [at UNA] is as vice-dean of the school of Natural Resources. There are 12 schools here and their main focuses are soil, water, and forests. (VIII, 19, 1) (2.UNIV) (XX)
- So far, the idea is to improve the college and create new majors within this faculty—as of now we’re very limited. We have agronomists with more knowledge about soil management and irrigation and not focusing on environmental problems. So, I think we need to train professional technicians on the faculty relating to environmental problems. At least we want to change this to a school—we have the school of forestry and the school of soil and water. The proposal is that, within three years, we would like to have a department of natural resources management and the other one in environmental protection. With these two departments, I think we will develop more things about the environment. (VIII, 19, 1) (2.UNIV) (XX)
- [UNA wants] to develop and first we want to have a post-graduate program about the Natural Resources Management. So far I cannot tell you what exactly the program we will have but this is the program we want to develop. At the moment, we only have agronomists and agricultural engineers—these are the two areas we have. But training in environmental education, we don’t have. This is a very big area missing in the university in general. (VIII, 19, 1) (2.UNIV) (XX)

- He said that he's afraid that students and teachers are not receiving agricultural education. They're taking science classes and leaning to work in the countryside and doing investigations in things like forestry, water, soil. Usually they leave to work with an organization but the professors here do receive training on how to give the classes but most of them do not receive training in education. (VIII, 19, 1) (2.UNIV) (XX)
- We have a subject here that is rural social development and we also have research methods class. In these areas, we look at technology of the people and also economical evaluation. I think we have students in the fifth year that they can work with a plan. Most of the research we do in this faculty is in collaboration with partners—we don't have an experimental site. We're working in Matagalpa and so far we have one in Jinotepe—most of the research is with small farmers. (VIII, 19, 1) (2.UNIV) (3.UNIV)
- From this participation [in a practicum in the field] of the students, now we have a proposal for a project where the students will go another five weeks—but this is extra pay—they will train the students to make an evaluation of the forestry system that they have and do an evaluation of the area's agriculture and after they will prepare a report. It is possible to have some help from the people. They like to work with the university and of course it is the cheapest labor. To me, it is possible for the students to do something and present something. (VIII, 19, 3) (2.UNIV) (2.TEC; 11.YOU)
- Also there is a project to have an extension of the university in Carazo with the Professor Silvio Echaverry. He's very interested in this project but it has been very slow. I think it would be very good for the university to work with this project -- in order to get trained to work in EE and also to have the same idea as to how to develop formal EE at the university here as well. (VIII, 19, 3) (2.UNIV) (XX)
- Any universities she doesn't know of either. She said that UCA has some projects that [MAN helps] out to send specialists on. If there's a thing that [UCA wants] to talk about, they'll bring in a specialist [from MAN]. (IV, 20, 4) (2.UNIV) (XX)

2.XC = extra-curricular activities

- She said that besides what's contemplated in the curriculum, they're trying to promote and to make the students aware of some extra-curricular activities that they have to do in order to get involved in these environmental issues—not as an obligation but making them feel the need of it—it comes as a niche—that they don't feel obliged but that they see the need and they do it at their own initiative. (11.MG, 4) (2.XC) (XX)

- There's a group called, "Amigos de las Naturaleza" (Friends of Nature). They don't really work for the environment—they just call themselves that. During the July vacation, they helped me to dig holes to bury the garbage at the school, they helped me plant a garden and work on a compost pile—and they really enjoyed it. (VI, 12, 8) (2.XC) (XX)
- She said that besides what's contemplated in the curriculum, they're trying to promote and to make the students aware of some extra-curricular activities that they have to do in order to get involved in these environmental issues—not as an obligation but making them feel the need of it—it comes as a niche—that they don't feel obliged but that they see the need and they do it at their own initiative. (I, 11, 4) (2.XC) (8.K; 8.12)

3. Environmental education resources available TO the interviewee's organization

3.BIB = bibliography of available resources

- These are from where I work—the Wisconsin Center for Environmental Education—and they're all resources in Spanish. And a lot of them are free. Some of them, you have to pay a little bit but, if you explain, but I explained to them that I was ordering them for Carazo—a department in Nicaragua—so they sent them for free. (VB, 6) (3.BIB) (XX)

3.CAS = cassette tape

3.COM = community member

3.CONF = conference proceedings

3.CURR = curriculum guide

- How to use their guidebook that they do have by MED. (VI, 3, 4) (3.CURR) (XX)
- They have in there their guide book that tells what the teachers are supposed to include what to teach the kids. (VI, 3, 4) (3.CURR) (XX)
- The unit in the book [MARENA's curriculum guide] isn't really specific, it just kind of says "Be nice to the environment. Don't throw things in the street." and stuff like that. (VI, 4, 5) (3.CURR) (6.EE)

- NAAEE is going to bring book packages for environmental education already translated into Spanish. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (3.CURR) (3.TEXT)

3.EXP = environmental expert

- She said that Don Silvio [Echaverry] is probably the only human resource she can think of where people can go ask questions and find out about what's going on or get information on the environment. (V, 18, 2) (3.EXP) (XX)

3.FILM = filmstrip

3.FOR = school forest

3.MOD = scientific model

3.MUS = museum

3.NAT = natural area

3.PAM = pamphlet

- Sometimes they [MED] give out a little pamphlet that tells them [teachers] what they could do. Like they have a list of activities they could do with the kids. (VI, 3, 8) (3.PAM) (XX)
- And MARENA has brochures and posters and that sort of thing? S: Yes. (VII, 10, 4) (3.PAM) (3.POST)

3.PARK = local park

3.PICT = picture book

3.POST = poster

- And MARENA has brochures and posters and that sort of thing? S: Yes, (VII, 10, 4) (3.POST) (3.PAM)

3.TEXT = textbook

- NAAEE is going to bring book packages for environmental education already translated into Spanish. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (3.TEXT) (3.CURR)

3.TNG = training guide

- This is for the educational 60 hours, that MARENA put out, and this is the guide for teachers on how to work on those 60 hours for teachers. It talks about the problems. This is how you would resolve the problems. These are your resources that you can use to help you to plan your 60 hours—this is for all of Nicaragua. This is showing, this is what they're supposed to be doing with their classes. They're supposed to be identifying problems with the students and making solutions. Like here it says that the principal problem is garbage, that the kids think it is. Then they write down what they think the effects of that problem would be then they plan solutions then they look at the resources they have to put together these solutions. This was put out by Jorge Luis Hernandez—who was with MED but is now with MARENA. (V, 23, 4) (3.TNG) (2.ECO; 14.MARENA)

3.UNIV = university specialist

3.VID = video tape

4. Environmental education resources available FROM the interviewee's organization

4.A/V = audio visual resources

- This is the EE law so they've put them on overheads for the teachers to look at and they have accompanied each by a picture because a lot of people don't like to read and it explains the law a little clearer. She said that's the material that [MAN uses] because Nicaraguans are lazy if they go to a workshop all day they don't pay attention. They're looking for ways to get them to learn in various ways. (IV, 20, 5) (4.A/V) (XX)

4.BIB = bibliography of available resources

- At the Ministry of Education level, they get some support as far as literature and illustrations and things of that sort and bibliographies—and there's some of it but [I think] it's not enough and [I think] that there's a lot of need to improve that. (I, 11, 4) (4.BIB) (4.CURR)

4.CAS = cassette tape

4.COM = community member

- Human resources are the 60+ people we have trained in over 15 organizations. (VI, 2, 7) (4.COM) (4.EXP)

4.CONF = conference proceedings

- We [MARENA] have a document that compiled all the suggestions and presentations [from the National EE Conference] that I think Carazo should have a copy of this—Silvio Echaverry at MARENA probably has a copy. (I, 5, 6) (4.BIB) (XX)
- We had the second meeting in November 1997 and we have a memoria—proceedings—a document. And so you could have the first meeting and then the second meeting. (I, 6, 3) (4.CONF) (2.CONF)

4.CURR = curriculum guide

- MARENA uses a general EE guide which park personnel use in all protected areas. (VI, 2, 7) (4.CURR) (XX)
- I don't think it's very effective to say "We have these Nicaraguan resources" which we do—we have a book created with activities for Nicaragua, but we don't have the funds to get them printed. (VI, 4, 7) (4.CURR) (6.\$)
- An important thing to mention is that the labeling that is in these environmental guide books is indispensable—this is a book done with MED in Nicaragua. It actually lists all the activities and at what point they apply directly to the curriculum so the teacher can go through her book and mark what areas she has activities for. NA: Most of the teachers don't have copies of this book, right? JB: No teachers have copies. NA: This is the one that the Peace Corps is trying to raise money to distribute? JB: This is the one that Peace Corps made. There are two of them—1st through 3rd and 4th through 6th. (VI, 4, 8) (4.CURR) (4.TNG; 6.\$)

- At the Ministry of Education level, they get some support as far as literature and illustrations and things of that sort and bibliographies—and there's some of it but she thinks it's not enough and she thinks that there's a lot of need to improve that. (I, 11, 4) (4.CURR) (4.BIB)
- And at certain localities, like in Chinandega and some other places, some organizations like the Peace Corps, they have elaborated some kind of material that they are using but she thinks that that material should be duplicated and should be sent to other communities so that they can use it so what's being done right now as far as providing those resources is not enough... (I, 11, 4) (4.CURR) (XX)
- We started using this book that was developed by Peace Corps volunteers and the MED in Guatemala and everything is active education. They use 10 different general topics usable in almost any community. For example, awareness of the environment., animals, trees, garbage, water, soil, protected areas, populations and sustainability, sustainable development and environmental ethics. Everything is with games and dynamics. (VI, 13, 9) (4.CURR) (XX)
- I have a committee in Panama that is also working with Peace Corps in EE but they started working in curriculum development with the MED so they created for each grade a manual. This is the 2nd grade—it has all the different courses: Spanish, math, natural science, and each one has objectives, a topic and a dynamic. We started using this with the Nicaragua curriculum and came up with this guide created by a Peace Corps volunteer and the MED in the community. What she did was using this to incorporate EE into the Nicaragua curriculum. Now it says for each course from 1st to 3rd grade what to do. (VI, 13, 9) (4.CURR) (14.MED)
- For example, this was a training that was sponsored by a volunteer, she did from 4th to 6th grade for example two days of the week and then gave out the manual. (VI, 13, 10) (4.CURR) (2.TTNG)
- There are few resources. In written materials we only have those which MARENA gives us or natural science texts, making use of the Ecological Museum. (II, 16, 2) (4.CURR) (4.MUS, 4.TEXT)
- She said that their focus date is Feb. 25, 1998 and they've only been working on it 6 months but they've gotten a lot of input from a lot of teachers and they think they'll be ready by that time. (IV, 20, 2) (4.CURR) (2.CURR)
- There are seven chapters in [MAN's environmental education curriculum guide] and it's more or less to give teachers an idea of how to incorporate EE into the classroom. They

have ideas like examples but they leave a lot of it up to the individual teachers as to how they teach it. For example, in Masaya they developed more of their EE on water because that's what they're the most worried about and they developed their own songs, social dramas and poems specific to the area of Masaya. They used the book as a guide but then they did their own work. It also helps the teachers not to have such a rote learning system which a lot of the teachers have. They also instruct people on things you can do in the house to help the environment. (IV, 20, 5) (4.CURR) (2.CURR)

4.EXP = environmental expert

- Human resources are the 60+ people we have trained in over 15 organizations. (VI, 2, 7) (4.EXP) (4.COM)
- For instance, with Dulce Nombres which is a very small community (smaller than most of the others; and all they have is a school and a church), I've tried to take the environmental charlas [talks] and integrate them into the curriculum rather than create a brigade or mini-program. I can work "one-on-one" with the teachers there since it is smaller. (VI, 4, 3) (4.EXP) (9.WRK)
- MARENA has a number of specialists in about every area related to the environment or forestry. These specialists are almost always willing to give small talks on whatever the need calls for. (I, 8, 1) (4.EXP) (XX)
- As far as extensionist work in Carazo, we find that Ing. Silvio Echaverry is one of our best human resources. In the future, we hope that all delegates will be able to focus more of their time and energy in extension work and environmental education within the community. This can be accomplished as a lot of their policing duties are taken over by others. (I, 8, 2) (4.EXP) (XX)
- She said that four years ago they started training medical staff to reproduce what they had learned in the field of pesticides in educational materials. They're using them to change the values and customs of people in their use of pesticides. That's where they've mainly focused themselves and over two or three years of the training they've come up with 30 to 40 types of resources over the indiscriminate use of poisons. (II, 22, 2) (4.EXP) (2.PEST)
- Yes, [CECOTROPIC has] human resources more than [other resources]. (V, 23, 8) (4.EXP) (XX)

4.FILM = filmstrip

4.FOR = school forest

4.GEN = general statements regarding resources available from interviewee's organization

- We have a list—I don't think it would be worth it to you if I mentioned all the materials that we have but I could give you the list. [Interviewer] That would be great. So then people in that department can then call you or write to you for copies of materials? [Subject] We don't have the resources to photocopy the materials but the people could come here or we have a person that very frequently goes to Carazo and, through that person, we might lend them the material. [Interviewer] I saw, as we were coming in, what looked like a library over there. Is that where the EE material is? [Subject] We have the material here. We should have it in that office but, right now—until the conditions are ready, we'll give them the material. They have another kind of materials. (I, 5, 5-6) (4.GEN) (XX)
- Really it doesn't have any, but in the [museum project's future] is a document center for which there already is money. We want financing for this third phase, which is the construction of this center. (IX, 14, 2) (4.GEN) (XX)
- [MAN has] some publications that they've done themselves here and they have also a collection of materials—stuff from Costa Rica, Panama, Ecuador, Chile. They said at the MED they don't have any materials at all on EE. (IV, 20, 4) (4.GEN) (XX)
- [The translator] asked her how you get the materials if you want them, she said that when they do the workshops they supply all the materials. They have also been working on teaching about the law on EE and they try to make them more practical so that you're not reading a law book to try to get people to know what kind of laws are out there and the positions the government has taken on EE. (IV, 20, 4) (4.GEN) (XX)
- [MAN has] a small document center. They have some materials they give away to students and they also have some they let you borrow to make copies from the document center. (IV, 20, 4) (4.GEN) (XX)
- MINSA and SILAS in Carazo doesn't count on any available materials in the educational development. They have some materials as in a copy of a video to talk about pesticides. As far as monetary resources are concerned, they have a certain amount but it's dedicated to training of health workers and sellers and some on the users of pesticides. They don't have enough to do all the activities they would like to do. They don't have enough to teach to students or household education on the use of pesticides. (II, 22, 3) (4.GEN) (6.\$)

- [CECOTROPIC doesn't] have anything that [I know] of that's open to the public. [My] work partners have documents and different things but those are theirs. [I] can get any of that for you and you can read it. (V, 23, 8) (4.GEN) (XX)

4.MOD = scientific model

- They will have [exhibits] on the biodiversity that is important, and the approximately 23 protected areas of the Pacific. The room where there is a simulation of the natural habitat of forest formation will stay the same. There will be exhibits of volcanic formations and only one description of a watershed, such as the Rio Grande. There will be an exhibit on the protected area of Chacocente, biodiversity associated with the coffee and explains the water cycle. (IX, 14, 2) (4.MOD) (XX)

4.MUS = museum

- Also, in Diriamba, MARENA has supported the ecological museum. (I, 8, 2) (4.MUS) (XX)
- It is for this reason that we are thinking about reorganizing this [museum] in the following manner: primarily delimiting the four climatic regions of Nicaragua. Later, categorizing the region of dry tropics that have as a study objective to introduce to us a little about the functioning the ecosystem. (IX, 14, 2) (4.MUS) (XX)
- There are few resources. In written materials we only have those which MARENA gives us or natural science texts, making use of the Ecological Museum. (II, 16, 2) (4.MUS) (4.CURR, 4.TEXT)

4.NAT = natural area

- Volcan Masaya is the exception in terms of resources available—they have more materials and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed. (VI, 2, 7) (4.NAT) (4.POST; 4.PAM; 4.PARK)
- Nicaragua's protected areas are also a resource. In and around the Carazo area, we have Chacocente and Volcan Masaya. In other areas of Nicaragua, we have Si a Paz and Bosawas. You can find more information about these protected areas by talking to Orlando Valasquez or Roger Roman, respectively. (I, 8, 1) (4.NAT) (XX)

4.PAM = pamphlet

- The director of EE in MARENA put out a publication with suggestions of things they can do to complete their 60 hours of work and how it should be done. (II, 1, 8) (4.PAM) (XX)
- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.PAM) (3.PICT; 3.POST; 3.TNG)
- Volcan Masaya is the exception in terms of resources available—they have more materials and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed. (VI, 2, 7) (4.PAM) (4.POST; 4.NAT; 4.PARK)

4.PARK = local park

- Volcan Masaya is the exception in terms of resources available—they have more materials and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed (VI, 2, 7) (4.PARK) (4.POST; 4.NAT; 4.PAM)

4.PICT = picture book

- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.PICT) (3.POST; 3.PAM; 3.TNG)

4.POST = poster

- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.POST) (3.PICT; 3.PAM; 3.TNG)

- Volcan Masaya is the exception in terms of resources available—they have more materials and resources and a more comprehensive visitors center than other parks though the materials need updating and are not the best designed (VI, 2, 7) (4.POST) (4.NAT; 4.PARK)

4.TEXT = textbook

- MARENA-Managua has a documentation center where the public or students can come and do research. (I, 8, 1) (4.TEXT) (XX)
- There are few resources. In written materials we only have those which MARENA gives us or natural science texts, making use of the Ecological Museum. (II, 16, 2) (4.TEXT) (4.MUS, 4.CURR)

4.TNG = training guide

- GreenCOM/Nicaragua will produce a minimum of: poster or storybook for buffer zone residents around sea turtle conservation sites; poster and brochure series for all eight protected areas in the “sistema minimo”; interpretive materials (currently being defined); practical training guide (to replicate training, also for reference); park guard training manual. (VI, 2, 3) (4.TNG) (3.PICT; 3.PAM; 3.POST)
- Also, the training manuals being produced by GreenCOM in conjunction with the park system will help provide a framework for training of personnel and then will be tailored to each individual park. (VI, 2, 4) (4.TNG) (XX)
- An important thing to mention is that the labeling that is in these environmental guide books is indispensable—this is a book done with MED in Nicaragua. It actually lists all the activities and at what point they apply directly to the curriculum so the teacher can go through her book and mark what areas she has activities for. NA: Most of the teachers don't have copies of this book, right? JB: No teachers have copies. NA: This is the one that the Peace Corps is trying to raise money to distribute? JB: This is the one that Peace Corps made. There are two of them—1st through 3rd and 4th through 6th. (VI, 4, 8) (4.TNG) (4.CUR; 6.\$)

4.UNIV = university specialist

- We have a subject here that is rural social development and we also have research methods class. In these areas, we look at technology of the people and also economical evaluation. I think we have students in the fifth year that they can work with a plan. Most of the research

we do in this faculty is in collaboration with partners—we don't have an experimental site. We're working in Matagalpa and so far we have one in Jinotepe—most of the research is with small farmers. (VIII, 19, 2) (4.UNIV) (2.UNIV)

- He said that three things that he wanted to say. Most of them go in and they support an institution that is working with the producers. The students aren't there for a long period of time because of the cost and the time so they only stay for a short period of time. They do work some directly with the producers and in crop management. (VIII, 19, 2) (4.UNIV) (2.TEC)
- He said that it does turn out to be mostly for the students. They have a five-week practicum—work with producers. They have the first one in this past year—between March and April—where they put the students with these different producers. (VIII, 19, 3) (4.UNIV) (XX)

4.VID = video tape

- The videos that are shown [at the Ecological Museum] concern the environmental problems of the department such as the deterioration of the Rio Grande and about the coffee plantations. (IX, 14, 2) (4.VID) (XX)
- They have some videos and materials that have been donated from the WWF and UICN (Union for the International Conservation of Nature)—they work in Mesoamerica—they have their regional office in Costa Rica and are partially supported or funded by WWF. (IV, 20, 4) (4.VID) (XX)
- [CECOTROPIC does] have a video that [we] put out on the forestry plan—but that's about it. (V, 23, 8) (4.VID) (XX)

5. Funding/sponsors of environmental education projects

5.ADE = ADECA

- The Germans moved out ... well, really ADECA was working on [the tree nursery/reforestation project] but the Germans were financing it. (VI, 3, 1) (5.ADE) (XX)
- Like, you could say ADECA has been effective because they have gotten money to do things in environmental work. (VI, 3, 6) (5.ADE) (XX)
- Most of the help [I get], as far as the resources are concerned, comes from MARENA and ADECA—the organization that built the ecological museum—and sometimes we manage to

get some money from some other organizations in order to provide for their requests for different activities that they develop in the beach and other places, provide support for the students. As far as implements are concerned, [the Ecological Brigade gets] some more help from MARENA and from ADECA. (VII, 10, 3) (5.ADE) (5.MAR)

- [I haven't] obtained very much help from those organizations but I haven't gotten in touch with those organizations in order to see about the possibilities of obtaining some help and that is the reason that most of the help that [I get] comes from ADECA and MARENA and in part from the Ministry of Education. (VII, 10, 4) (5.ADE) (5.MED; 5.MARENA)
- This museum project was carried out by the Association for the Development of Carazo (ADECA) with financing for the first phase from the Canadian government through the environmental fund. The second phase, which is in progress now, is being funded by the Crensem state (Germany). (IX, 14, 1) (5.ADE) (5.GER, 5.CAN)
- ADECA created these three videos so that the museum can be promoted [and raise] a lot of the necessary money, which it does not have. (IX, 14, 2) (5.ADE) (XX)

5.AID = US AID

- GreenCOM is the environmental education and communication project funded by USAID and managed by the Academy for Educational Development. (VI, 2, 2) (5.AID) (XX)
- I know that, in San Salvador, AID is financing a big project and this project is like a [?], that makes everybody do things at the same time. But they have financed it for \$2 million during four years, and they're working hard with the brigadistas, they're working with the schools, they have a lot of materials that they already have done. But we don't have that here in Nicaragua. (I, 6, 5) (5.AID) (6.\$)

5.BID = Bank of International Development (International Development Bank)

- It is a five year project sponsored by BID (International Development Bank), the government of Sweden, Nordic funds, and the government of Nicaragua. (V, 7, 1) (5.BID) (5.SWE;

5.CAN = Canadian government or NGO

- The Danish had Canadians as technical assistants for the financial and technical management—I'm not sure if you understand that kind of organization. The Danish contract the Canadians who are the ones that technically finance and manage all the things. (I, 6, 2) (5.CAN) (5.DAN)

- This museum project was carried out by the Association for the Development of Carazo (ADECA) with financing for the first phase from the Canadian government through the environmental fund. The second phase, which is in progress now, is being funded by the Crensem state (Germany). (IX, 14, 1) (5.CAN) (5.ADE, 5.GER)

5.CEC = CECOTROPIC

- [The Jinotepe mayor's office has] also been getting help from CECOTROPIC. They help the small producers with financing for planting basic crops and for reforestation. (III, 21, 2) (5.CEC) (14.CEC; 2.TEC; 2.REF)

5.DAN = Danish government or NGO

- Right now we [the EE department of MARENA] have Danish support but not as much as that time. (I, 6, 1) (5.SWE) (XX)
- And your consultant who is here, is he/she through the Danish contacts? VB: Yes, he was financed by the Danish but he is Nicaraguan. (I, 6, 2) (5.SWE) (XX)
- The Danish had Canadians as technical assistants for the finance and technical management—I'm not sure if you understand that kind of organization. The Danish contract the Canadians who are the ones that technically finance and manage all the things. (I, 6, 2) (5.SWE) (5.CAN)

5.EU = European Union

- (PROSESEUR) being financed by the European Union. (II, 1, 9) (5.EU) (XX)

5.FIN = Finnish government or NGO

5.FUN = FUNCOD

- Their main work is to support programs in environmental education (EE), deforestation, watershed projects—any kind of project that's going on in Carazo they support with their people or in whatever way they can support it. They do formulate some small projects in the area. She's been working mainly with MARENA and me as far as EE and they've been focusing mainly on the schools. (V, 18, 1) (5.FUNCOD) (2.K12; 14.FUNCOD; 14.MAR)

5.GER = German government or NGO

- As it turned out, the mayor's office was to take over a German project that was made for tree nurseries in town—the Germans were running it for one year and the mayor's office was supposed to be running it for the next year. (VI, 3, 1) (5.GER) (XX)
- The Germans moved out ... well, really ADECA was working on it [tree nursery/reforestation project] but the Germans were financing it. (VI, 3, 1) (5.GER) (XX)
- Some of the activities [the Ecological Brigade is] involved in are quality education with the forest that was established there with the assistance of MARENA and some funds that were obtained by some organizations from Germany (VII, 10, 2) (5.GER) (5.MARENA; 2.TREE)
- [I have] even obtained some financing from Germany which allowed them to reactivate the nursery [I] was talking about. They got some money and when the students from Germany come here, they also help planting trees and doing some other activities related to environmental education issues. (VII, 10, 3) (5.GER) (XX)
- This museum project was carried out by the Association for the Development of Carazo (ADECA) with financing for the first phase from the Canadian government through the environmental fund. The second phase, which is in progress now, is being funded by the Crensem state (Germany). (IX, 14, 1) (5.GER) (5.ADE, 5.CAN)
- She said that MAN was started in 1988 and they had their first stable organization in 1990. They are an NGO supported by different organization from Holland and WWF and Oxfam. They have a German partner who is helping out right now and they get some funding from German organizations too. They're working in EE. (IV, 20, 1) (5.GER) (5.WWF; 5.OXF; 5.HOL)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (5.GER) (14.MAR; 14.CEC; 14.FUN; 14.POS; 2.CMS)

5.HOL = Dutch government or NGO

- She said that MAN was started in 1988 and they had their first stable organization in 1990. They are an NGO supported by different organization from Holland and WWF and Oxfam. They have a German partner who is helping out right now and they get some funding from German organizations too. They're working in EE. (IV, 20, 1) (5.HOL) (5.WWF; 5.OXF; 5.GER)

5.IAB = Inter-American Bank of Development

- If we implement these projects with an EE program parallel to it, our chances to reduce these illegal activities are getting better; one of these projects is called the POSAF, Proyecto Social Ambientale y Forestale (Social, Environmental, and Forestry in Development Project) financed by the Inter-American Bank of Development to promote agroforestry. (II, 1, 5) (5.IAB) (XX)
- (PROSESEUR) being financed by the Inter-American Bank of Development. (II, 1, 9) (5.IAB) (XX)

5.MAN = MAN

5.MAR = MARENA

- It is a five year project sponsored by BID (International Development Bank), the government of Sweden, Nordic funds, and the government of Nicaragua. (V, 7, 1) (5.MAR) (5.SWE; 5.BID)
- Some of the activities [the Ecological Brigade is] involved in are quality education with the forest that was established there with the assistance of MARENA and some funds that were obtained by some organizations from Germany. (VII, 10, 2) (5.MAR) (5.GER; 2.TREE)
- Most of the help [I get], as far as the resources are concerned, comes from MARENA and ADECA—the organization that built the ecological museum—and sometimes we manage to get some money from some other organizations in order to provide for their requests for different activities that they develop in the beach and other places, provide support for the students. As far as implements are concerned, they get some more help from MARENA and from ADECA. (VII, 10, 3) (5.MAR) (5.ADE)
- [I haven't] obtained very much help from those organizations but [I haven't] gotten in touch with those organizations in order to see about the possibilities of obtaining some help and

that is the reason that most of the help that [I get] comes from ADECA and MARENA and in part from the Ministry of Education. (VII, 10, 4) (5.MAR) (5.ADECA; 5.MED)

- In the Minister of the Environment, MARENA, it looks like every year the budget is getting smaller and they get less money and less resources to work with and this is the reality... (VII, 10, 4) (5.MAR) (10.PRI)

5.MAY = mayor's office

- I suggest financing partners through MED and the mayor's office to get to know the environmental problems. (III, 9, 1) (5.MAY) (5.MED)

5.MED = MED

- I suggest financing partners through MED and the mayor's office to get to know the environmental problems. (III, 9, 1) (5.MED) (5.MAY)
- [I haven't] obtained very much help from those organizations but [I haven't] gotten in touch with those organizations in order to see about the possibilities of obtaining some help and that is the reason that most of the help that [I get] comes from ADECA and MARENA and in part from the Ministry of Education. (VII, 10, 4) (5.MED) (5.ADECA; 5.MARENA)

5.MINSA = MINSA

5.NAT = Nature Conservancy

- The Nature Conservancy is involved in Bosawas [nature preserve in northern Nicaragua]. (VI, 2, 8) (5.NAT) (XX)

5.OXF = Oxfam

- She said that MAN was started in 1988 and they had their first stable organization in 1990. They are an NGO supported by different organization from Holland and WWF and Oxfam. They have a German partner who is helping out right now and they get some funding from German organizations too. They're working in EE. (IV, 20, 1) (5.OXF) (5.WWF; 5.HOL; 5.GER)

5.PC = Peace Corps

- When Vonda was working with us, the Peace Corps also contributed because Vonda was working with a group of those students, making those signs that explains things and getting some other materials that they implemented in those days. Of course I made another proposal to the Peace Corps asking for another volunteer but I haven't heard about that yet. (VII, 10, 4) (5.PC) (XX)

5.POS = POSAF

- POSAF finances organizations to work with groups of producers within the following areas: Agroforestry, in which we only finance organic farming—nothing with chemicals. In silvopastoral, we give financing to better pasture land but not to buy more cattle. POSAF provides a 30 to 60 percent incentive to the producer, depending on their case. (V, 7, 1) (5.POS) (2.TEC)

5.PROS = PROSESUR

5.PV = Private organizations

5.SWE = Swedish government or NGO

- So, [EE in MARENA] was a big direction with Swedish support. The time that you're talking about, the environmental education was a unique direction and it had Swedish support. (I, 6, 1)
- It is a five year project sponsored by BID (International Development Bank), the government of Sweden, Nordic funds, and the government of Nicaragua. (V, 7, 1) (5.SWE) (5.BID; 5.MARENA)

5.WB = World Bank

- (PROSESEUR) being financed by the World Bank. (II, 1, 9) (5.WB) (XX)

5.WWF = World Wildlife Fund

- She said that MAN was started in 1988 and they had their first stable organization in 1990. They are an NGO supported by different organization from Holland and WWF and Oxfam. They have a German partner who is helping out right now and they get some funding from

German organizations too. They're working in EE. (IV, 20, 1) (5.WWF) (5.HOL; 5.OXF; 5.GER)

- [MAN is] getting funding from WWF—they're funding the workshops and the printing of the book. (IV, 20, 2) (5.WWF) (XX)

6. Problems with environmental education projects currently under way

6.\$ = lack of funding

- The mayor had little or no interest in running the tree nursery so he didn't finance it or put anybody in charge of it—except for me. I was to be running the whole thing for free for him. (VI, 3, 1) (6.\$) (XX)
- There are a few Nicaraguan volunteers that are effective but only once in awhile and you can't really blame them because they're pure volunteers and they're not getting paid any money or help and most of them have the need for it so their interest dwindles—it comes on some projects and goes away on others. (VI, 3, 6) (6.\$) (XX)
- As far as sustainable environmental education that will actually change the situation of Diriamba or Carazo, I don't believe they've been effective. Basically, I think they're just keeping themselves going on what money they get and so I don't think they have a real interest in the environment or a long-term strategic plan. (VI, 3, 6) (6.\$) (XX)
- So I try to find other volunteers in the community who would possibly like to take control. But I can't force them to and their animation level goes from high to low because they are volunteers and they're looking for other work because there's nobody assigned just to that. (VI, 3, 8) (6.\$) (XX)
- I don't think it's very effective to say “We have these Nicaraguan resources” which we do—we have a book created with activities for Nicaragua, but we don't have the funds to get them printed. (VI, 4, 7) (6.\$) (4.CURR)
- So the teachers get money from MED to cover those things? JB: Yes, and they were up in arms about it because it wasn't variable. They were coming from all different areas but they all got paid the same and most of them ended up trying to race home for an hour to eat lunch because they didn't want to pay to eat a meal there. That seems to be more effective if an in-service training like that were kind of like you'd present the materials to them and say “This is how you do it” and it won't be 100% effective—that's kind of one of the frustrations of working here. (VI, 4, 8) (6.\$) (2.TTNG)

- Three things we're working on: a strategy, the pilot program and a campaign that we are trying to design for the next four months but we don't have enough money so I don't know if we'll be able to do the campaign that we're trying to do. (I, 5, 3) (6.\$) (2.CAM; 2.NATL)
- And do you have any ideas why there weren't as many people [at the second meeting]—because at the first meeting, there were lots of people. SE: The location, probably. VB: We didn't want it as big because it's very expensive and here in MARENA they say that environmental education is a priority but it's not so. SE: When it comes to support, they seem to forget. VB: We have the money but you see that they don't have confidence—they question and so we decided to make it a little smaller. (I, 6, 4) (6.\$) (XX)
- I know that, in San Salvador, AID is financing a big project and this project is like a [?], that makes everybody do things at the same time. But they have financed it for \$2 million during four years, and they're working hard with the brigadistas, they're working with the schools, they have a lot of materials that they already have done. But we don't have that here in Nicaragua. (I, 6, 5) (6.\$) (5.AID)
- The departmental commission on environmental education is trying to work on some of these problems [soil erosion, deforestation, disappearance of native species, water pollution, pesticide poisoning, lack of EE programs] but they need help finding funding to promote projects. (V, 7, 1) (6.\$) (XX)
- The resources are very scarce and we should try to do more things. They have the science, and [I don't]—the salary they get is very little so the things they do—they don't do it because they want to get an economical reward but that they do it because they want to have a more beautiful environment. [We] have a more beautiful place as far as scenery than Guatemala and some of the rewards that they get is that they have the opportunity to go to some places with the school like Masaya, Mombacho, and some other places so that's the fact that's rewarding to them. (VII, 10, 4) (6.\$) (10.\$)
- One of the things [I desire] the most is to learn the English language but [I don't] have the resources to do it. As a matter of fact, the teachers salary was going to be increased but that the increase [we] were promised didn't come through. The primary school teacher gets \$40 a month and the secondary teacher gets \$60, a salary which is hard to live with And [I have] also elaborated some projects to improve the living conditions of some of the teachers that work with [me] at the school and [I have] been successful in finding some organizations who have given funds to improve the houses and other living conditions of some of the teachers who work there. (VII, 10, 5) (6.\$) (10.\$)

- It is used only by the Peace Corps volunteers because we don't have the money to use it with the teachers. I wrote a grant trying to find the funds but we didn't get it. We will have, in October, a group meeting of all EE volunteers to incorporate this—there is more information that they have developed—they will have one manual just in case we have the money in the future so hopefully the teachers will have them. We're planning to introduce this manual to the Minister of MED so he can lobby somewhere for the money. (VI, 13, 9) (6.\$) (9.WRK; 14.MED)
- For example, the Ecological Brigade in San Marcos, with the help of the mayor's office, is cleaning up the river. The MED does not have the resources to give transportation support so we made an agreement with the heads of households and they pay the gas and MED gives the bus. We have economic and human resources to continue and control the reforestation and environmental projects, and the jurisdictional aspect. (II, 16, 2-3) (6.\$) (2.ECO, 14.PRIV, 14.MED)
- They just need to get some organization there to also help with the problem of disappearing of fauna which is mainly the shrimp and crab that are in the water. They need some money to start putting up signs and messages to stop the people from poisoning the river to get out the crabs. (III, 17, 2) (6.\$) (XX)
- It was applauded by a lot of organizations and groups but wrote up a mini-project but they haven't gotten an answer as far as where their funds are coming from to do it. They are looking for materials to start the project around here. They had thought about planting some trees but since the rains haven't started yet they haven't started with that and they're waiting for winter to set in so that they can have the trees in a stable state. Meanwhile, they're still waiting on getting some funding to start their projects. So, he finds economic problems . . . (III, 17, 2) (6.\$) (XX)
- MINSA and SILAS in Carazo doesn't count on any available materials in the educational development. They have some materials as in a copy of a video to talk about pesticides. As far as monetary resources are concerned, they have a certain amount but it's dedicated to training of health workers and sellers and some on the users of pesticides. They don't have enough to do all the activities they would like to do. They don't have enough to teach to students or household education on the use of pesticides. (II, 22, 3) (6.\$) (4.GEN)
- . . . unfortunately those teachers who are in charge of those 60 hours don't get paid any extra and, unless they get paid, they're not going to do any kind of programs of that sort, that would invest more time. It's easier for them to just have kids pick up garbage for those 60

hours. And the others that might be interested in it are involved in so many other things and don't have the time for it. (V, 23, 4) (6.\$) (6.TIME)

- . . . [I believe] it's a really good resource to do the teaching there with the teachers and the students but a lot of people don't feel that that's that important and, right at the moment [CECOTROPIC and MED] don't have a lot of money to do these programs at the Normal. (V, 23, 7) (6.\$) (2.TTNG)

6.CNG = project demands big change from participants' current lifestyle

- Actually, we've never done any study on who has carried through using them. I suspect the number is pretty low because it is a big change. (VI, 3, 3) (6.CNG) (XX)

6.COMM = lack of communication and coordination *between* projects/organizations

- We have pointed out that we don't want to have the efforts be dispersed, to be doing several things at the same time. We have told the county and rural commissions that they must take care of their own initiatives and try to solve their problems at a local level unless something gets out of hand then they can come to the state level for support; but whatever they do, they must not disperse their efforts, everything must work through the proper channels so that several organizations are not doing the same thing at the same time and to use the resources more rationally. (II, 1, 10) (6.COMM) (XX)
- Well, the role of this office is getting clearer, clearest but environmental education needs a big project, that we don't have right now who helps different institutions to do things—help the Ministry of Health, the Ministry of Education, the civil society needs to work, to do things around environmental education. (I, 6, 5) (6.COMM) (XX)
- She says that what she would like to add is that there are some organizations, like the one we just mentioned, Farmer to Farmer where some more information, some other educational material could be obtained and that she will be more that happy to get in touch with these other organizations, whatever is possible, in order to be able to obtain that kind of material and also to get a better coordination at national level because a lot of efforts are duplicated because a lot of organizations are working by themselves and probably if we coordinated actions a more efficient type of work will be done. (I, 11, 4) (6.COMM) (14.FTF)
- They didn't want to create a commission that was doing work in the different areas of Carazo because there's a lot of jealousy. If you start doing a project in one area, everybody says that you should be doing it in another and they didn't want to have that so they were

created to help out in the different areas with the different groups. (V, 23, 8) (6.COMM)
(XX)

6.CONN = lack of connection of learning to “real life” or community

- But, I find that they have a lot of problems too because, even though I’ve been trying to give them an environmental conscience, they know that there’s a problem there and they’re in an ecological brigade because of it but, the same kid, you can give a lecture on garbage and why we don’t throw it into the streets but then afterward everyone can have a piece of candy and I’d say that 95 percent of the papers go into the street—right after the talk. And, it doesn’t only happen with them—it happens in the schools too. You’ll go into a school and it might be their week of the environment and they have all this stuff that says “Clean up” and they actually might have a trash cans around and all the kids throw it in when they’re in the school but they walk outside and buy a bag of something and throw it on the ground right away. (VI, 3, 2) (6.CONN) (XX)
- Another problem is that the kids aren’t involved, the teachers tell them what to do. Like this weekend we’re going to pick up trash on Saturday and all the kids go along and they just do it, they don’t know why they’re doing it or anything. (VI, 3, 4) (6.CONN) (XX)
- “We had to go clean up trash.” But that’s not environmental education. They’re not getting any consciousness of what’s going on, they’re not learning anything about the environment or what its needs are and what their place in taking care of it is. They’re just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don’t even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 7) (6.CONN) (XX)
- And for a short time [the campaign or parade] is a success, but there’s no long term follow-up or even long term plans for the environmental education. It’s just, “We’ll tell the kids this and we’ll tell the people this and we’ll have this campaign, we’ll have this big thing.” And then nothing else, it’s not like included in everything. (VI, 3, 7) (6.CONN) (XX)
- They have their little tiny segment of EE but it’s not very specific and doesn’t really seem to have an effect—the kids don’t see it or live it outside of the school. (VI, 4, 4) (6.CONN) (XX)
- But now their attitude has changed a lot. Once they started doing more stuff, they had more pride, a lot more pride in their community. That’s an important thing—try not to cut off the

education from the community. With the culture here, it has to be a community thing. It can't just be like "Okay, we're going to throw these charlas [talks] in the schools." The way the health and ecological brigades work, we're going to go door-to-door. It sounds so old fashioned but that's what you have to do here—you can't send nice, little typed up letters to their house so we go door to door. (VI, 4, 4) (6.CONN) (6.INT)

- A big restriction is that the kids don't live what they learn in school. I haven't met a lot of the parents but the attitude about school seems to be that you have to go to school now, but there's not any future in it so you're just kind of there and just kind of pushed to get the "passing" point and once you get to 6th, 7th, 8th, 9th grade, you drop out and try to work. (VI, 4, 5) (6.CONN) (XX)
- We're trying to preach these things in the school, and his mother is throwing plastic bags out in the road and burning plastic bags in the backyard. The kid is thinking, "Well, in school today we learned that plastic bags are bad for the environment but my whole family is doing it so why do I need to change?" I think that's a big part of it. (VI, 4, 5-6) (6.CONN) (XX)
- Another volunteer lives across the road from me and she has a lot more problems—I think because her school is larger and teachers aren't that interested in working—they're not as involved with the community and with the students' lives. (VI, 12, 2) (6.CONN) (6.LINT)

6.COORD = lack of internal coordination within project

- And they do have the time and I believe that they do have the resources, it's just getting those together. (VI, 3, 4) (6.COORD) (XX)
- It's not taking advantage if they don't have the, they could have at the beginning of each school year, or before that, the responsible teachers for the environmental project sitting down with say the environmental commission and planning out what each school was going to do and how different organizations were going to aid them in that project. (VI, 3, 4) (6.COORD) (XX)
- Well, the role of this office is getting clearer, clearest but environmental education needs a big project, that we don't have right now who helps different institutions to do things—help the Ministry of Health, the Ministry of Education, the civil society needs to work, to do things around environmental education. (I, 6, 5) (6.COORD) (6.COMM)
- See, one of the things that it seems to me has sort of a negative impact on the environmental education strategy is that no organization has assumed the direct responsibility. In the beginning, it was the Ministry of Education but then you end up with most of the people in

MARENA doing the work—even promoting the consciousness. Probably that's one thing that has a negative impact on it. (I, 6, 5) (6.COORD) (XX)

- But do it more often during the semester because they have them after each semester. They have a bunch of workshops but they don't seem to do a lot in these workshops—they should be better planned. (VI, 12, 6) (6.COORD) (XX)
- [Peace Corps volunteers] also work in non-formal education through the agricultural producers. That component of our program is a lot smaller than EE—the only reason for that is that it is very difficult to find organized groups of farmers where we can target and work very efficiently with them so at the beginning of this program (2 years old) we started with half of the volunteers working in formal and half in non-formal. (VI, 13, 5) (6.COORD) (8.AG; 2.TEC)
- She said that lately [FUNCOD has] been having problems with the foundation so that she hasn't been receiving a lot of help and there hasn't been a lot of communication between her and the central office as far as resources and materials that she can use here in Carazo but she'll try her best to answer the questions. She's the only representative of FUNCOD in Carazo. (V, 18, 1) (6.COORD) (XX)

6.COUN = lack of appropriate counterpart for foreign project

- So, lack of a knowledge of what was a tree nursery and what went into making a tree nursery and what went into running a tree nursery. (VI, 3, 1) (6.COUN) (XX)
- And he was supposed to give a counterpart to me, which he did give which was a lady who works in the market. The reason she was my counterpart was that she was the only lady on the council and he didn't want me working with the man so it kind of turned out that I was doing the tree nursery on my own because nobody knew what was going on, nor did they really care. (VI, 3, 1) (6.COUN) (XX)
- So, the kids liked the idea of working on the weekends—they always participated then. But as Peace Corps, we need to work with other Nicaraguans—and I couldn't get the teachers to do it. Well, I got one teacher to do it maybe two or three Saturdays and that was all and he no longer wanted to do it. He resigned from being the Brigada leader. And so then I was not going to end up like I did with the mayor's office—doing all of the work and not having any support. (VI, 3, 2) (6.COUN) (XX)
- Yes, and for that we're supposed to work with a counterpart but like I said, the counterparts here aren't ... like, we're to work with environmental education or forestry. Like, I was

initially in forestry department but I was put with the mayor's office who didn't have anybody working in forestry to work with me. Yeah, he was told he was to give me a counterpart so he got me the woman who is in charge of the market. She doesn't know what's going on in forestry, nor does she care. So, that's the biggest problem is that they don't have the counterparts that will carry through. Or the counterparts they do have might have a little interest in environmental education like, right now, Silvio Echaverry is my counterpart and he would probably like to do environmental education projects but he is the delegate so he has a million other things to do. And his first love is not environmental education projects, being a delegate of MARENA or whatever, and he's doing all these other politically important things but there's nobody set aside for environmental education so I find myself doing it on my own and, when I leave (VI, 3, XX) (6.COUN) (XX)

- It's been set up where I do the work and then I leave even though I've been trying to find somebody to take over, there's nobody put in that position to take over. And that's what we're initially here to come to is to help those MED people and put them in charge of that or to help train them to work side by side with them for two years but there's nobody put in that position so when we come in we're either working half with one guy who's responsible for five other things, who's really not interested in what you're doing that much even though he is ... or she is dedicated by the mayor as being in charge of reforestation projects even though her interest is the market. (VI, 3, 9) (6.COUN) (XX)
- A lot of stuff that I do kind of ends up at a dead end and I have to skirt my way around it. It took about three months for me to find teachers to work with because I was just driving myself crazy because I was working with the wrong teachers and they didn't have any interest in the program. I was trying to explain to them "This isn't my program. I'm not going to live here for the next 20 years and do this in your school." I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just 3rd and 4th graders and just picking out the really good teachers. (VI, 4, 8) (6.COUN) (6.LINT; 6.FOR)

6.EE = lack of one person specifically focused on environmental education

- They're into aiding and giving advice and they don't have a bunch of paperwork like MARENA's technicos, have to write permission for cutting down trees, they have to go out and inspect the trees, there's nobody set aside just for environmental education.(VI, 3, 6) (6.EE) (XX)

- At MED, they're worrying about doing the parade for this or that. They all have other divided attentions. There's nobody in MED seriously dedicated to working on the 60 hours, or the environmental education—that's like that's their only job so they can focus on [EE]. (VI, 3, 6) (6.EE) (XX)
- There's nobody in the mayor's office that's focused on [EE]. (VI, 3, 6) (6.EE) (XX)
- The people you're working with either in MARENA or MED or they have other things to do, there's nobody set up for just this problem or just to concentrate on it. (VI, 3, 6) (6.EE) (XX)
- It would be nice if each mayor's office was required to have somebody who was actually trained in coordinating and doing all of this or MED had somebody or MARENA had somebody—that there were some people who were dedicated to environmental education formally and non-formally. I mean, I think they'd have better results if there was somebody who was just paid to do that job and they were well-trained or even the organizations had somebody just in that. Like they have these organizations and they have this one person doing a million things—how to talk to the producer, how to grow pigs, here and there—they don't just have the environmental education, so they might help out on one project and they realize they're not getting anything out of it so they just go on. (VI, 3, 6) (6.EE) (XX)
- Like they have these organizations and they have this one person doing a million things—how to talk to the producer, how to grow pigs, here and there—they don't just have the environmental education, so they might help out on one project and they realize they're not getting anything out of it so they just go on. (VI, 3, 6) (6.EE) (XX)
- There's nobody set aside for environmental education. (VI, 3, 8) (6.EE) (XX)
- That tells me, in itself, that even though MARENA, as the Ministry of Natural Resources, they don't find environmental education important. They've set aside four people at the national level and they sweep in, every once in awhile to the Carazo office, and they want to see what kind of environmental education is going on, they make a list, they bring it back home to the central office and they say, "Look—these are the environmental education projects that MARENA is doing." (VI, 3, 8) (6.EE) (XX)
- Everybody wants to take credit and put down that it's important to them, but it's not important to them. It's not important to MED either. Yeah, they have this 60 hours, they have this new environmental law but it's not important to them because they don't have one person set aside to make sure, on the departmental level they don't—and they have thousands of students. On the municipal level they don't either. In the schools, they might

have one teacher to do their fifth year, or two teachers . . . these teachers don't know anything. (VI, 3, 8) (6.EE) (XX)

- Everybody is signing the law saying this is a good idea but I don't see this being a priority for them because they haven't set up somebody to take care of it. I mean, if it was a priority problem, they would have somebody in there doing it. (VI, 3, 8) (6.EE) (XX)
- And I think they actually want help, because like the guy in MED here is always calling me in and saying, "Well, you can work up this project with me." Because they don't have anybody set aside in MED to do it, he wants me to do it. (VI, 3, 8) (6.EE) (XX)
- [The teachers] seriously don't have the knowledge about a lot of areas. The unit in the book isn't really specific, it just kind of says "Be nice to the environment. Don't throw things in the street." and stuff like that. (VI, 4, 5) (6.EE) (3.CURR)
- A project has been presented to Congress for the regulation of forest projects has been passed on to the Ministry of Agriculture and that it probably will leave the MARENA delegation in a short time—and I hope it works out because too much time is wasted. It would give more time to environmental education—we feel underrated—we want to do something else to support environmental education. So we can then pass this work on to the Ministry of Agriculture. (I, 6, 5) (6.EE) (XX)
- She is the only person right now but [MED] has the intention of reinforcing the program and more people that are working here that are experts in the ecology and the natural science. They are going to reinforce this, not the department but the commission is going to work on environmental education. (I, 11, 2) (6.EE) (XX)

6.FOL = lack of follow-up, follow through after program

- And for a short time [the campaign or parade] is a success, but there's no long term follow-up or even long term plans for the environmental education. It's just, "We'll tell the kids this and we'll tell the people this and we'll have this campaign, we'll have this big thing." And then nothing else, it's not like included in everything. (VI, 3, 7) (6.FOL) (XX)
- There's not follow-up and there's not evaluation. It's a one time shot. It's fun for everyone but then it's over with. You do it for a week and then . . . that's how all projects are. (VI, 3, 7) (6.FOL) (XX)
- When I leave, nobody's going to take control. (VI, 3, 8) (6.FOL) (6.FOR)
- I may be being negative because I know a lot of people have had projects and a lot of projects have been nice but to be effective, they've got to be sustainable. And I don't feel

that I've been that effective either because it hasn't been set up where it can be sustainable. It's been set up where I do the work and then I leave even though I've been trying to find somebody to take over, there's nobody put in that position to take over. (VI, 3, 8) (6.FOL) (10.ONE; 6.FOR)

- At this point, there is no guarantee to ensure training continues for new employees. It depends on the government continuing to support the office after GreenCOM is gone—hoping for the multiplier effect to occur but not formally incorporated into the workshop design (i.e. recently, a ranger who participated in a training approached [me] wanting to conduct their own workshop for their park personnel). (VI, 2, 4) (6.FOL) (6.ONE; 6.FOR)
- Schools, different organizations and political groups have a kind of systematic EE. It comes and goes—it's a one time thing—they have a big campaign. It's kind of like the festivals of the patron saint. They come once a year and go past but there's no education that continues. (III, 17, 1) (6.FOL) (2.CAM)

6.FOR = foreigners work then leave

- So I find mostly it's the volunteers that work in the area, and it tends to be the foreign volunteers because they're paid a certain amount of money because that's their job and so they seem to be effective. The problem is that they're not from here so they only stay so long and then they go home and even though all of the organizations I've seen have good intentions and they want you to work with someone else, the people you're working with either in MARENA or MED or they have other things to do, there's nobody set up for just this problem or just to concentrate on it. So, they seem to be more effective. (VI, 3, 6) (6.FOR) (XX)
- I may be being negative because I know a lot of people have had projects and a lot of projects have been nice but to be effective, they've got to be sustainable. And I don't feel that I've been that effective either because it hasn't been set up where it can be sustainable. It's been set up where I do the work and then I leave even though I've been trying to find somebody to take over, there's nobody put in that position to take over. (VI, 3, 8) (6.FOR) (10.ONE; 6.FOL)
- At this point, there is no guarantee to ensure training continues for new employees—it depends on the government continuing to support the office after GreenCOM is gone—hoping for the multiplier effect to occur but not formally incorporated into the workshop

- design (i.e. recently, a ranger who participated in a training approached [me] wanting to conduct their own workshop for their park personnel). (VI, 2, 4) (6.FOR) (6.ONE; 6.FOL)
- A lot of stuff that I do kind of ends up at a dead end and I have to skirt my way around it. It took about three months for me to find teachers to work with because I was just driving myself crazy because I was working with the wrong teachers and they didn't have any interest in the program. I was trying to explain to them "This isn't my program. I'm not going to live here for the next 20 years and do this in your school." I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just 3rd and 4th graders and just picking out the really good teachers. (VI, 4, 8) (6.FOR) (6.LINT; 6.COUN)
 - When I leave, nobody's going to take control. (VI, 3, 8) (6.FOR) (6.FOL)

6.INT = lack of interest on the part of the participants

- Like, if MARENA were having an activity, the teacher would call the kids on the list and tell them they were having this activity. Or, they might do one little project in the school but, rarely ever did they have meetings where the whole brigade would get together and discuss what problems there were and what they would do about them or would they have projects. (VI, 3, 2) (6.INT) (XX)
- Another problem is that the kids aren't involved, the teachers tell them what to do. Like this weekend we're going to pick up trash on Saturday and all the kids go along and they just do it, they don't know why they're doing it or anything. (VI, 3, 4) (6.INT) (XX)
- They just want to get those hours over with so that they don't have to dedicate any more of their Saturdays or after-school hours. (VI, 3, 4) (6.INT) (XX)
- "We had to go clean up trash." But that's not environmental education. They're not getting any consciousness of what's going on, they're not learning anything about the environment or what its needs are and what their place in taking care of it is. They're just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don't even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 7) (6.INT) (XX)
- But, with the brigades, I've notice that the kids are changing a lot of their ideas. When we first took them out to plant trees, they were carrying their trees upside down because they weren't *their* trees, they were *my* trees because they were out of my vivero [tree nursery].

But now their attitude has changed a lot—once they started doing more stuff, they had more pride—a lot more pride in their community. (VI, 4, 4) (6.INT) (6.CONN)

- You have to stick to smaller groups here because people get off track really fast. The bigger the groups get, the harder it is and it just defeats your purpose. I'd definitely say the best groups to work with are small groups with the same interests—like small religious groups, small brigades in the schools, small brigades in the communities. (VI, 4, 10) (6.INT) (12.BRIG; 2.BRIG)
- She said the first thing you'll probably ask a student in Carazo is, "What do you think is environmental education?" Another problem is that with the 60 hours of ecological work a lot of people are left to the mayor's office and they're doing street clean up and stuff like that because the teachers don't know what to make them do. (IV, 20, 5) (6.INT) (6.KNOW)

6.KNOW = lack of knowledge on the part of the project's leaders

- The mayor's office was to take it over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone have anyone who had any idea what was going on with the tree nursery. So, lack of a knowledge of what was a tree nursery and what went into making a tree nursery and what went into running a tree nursery. (VI, 3, 1) (6.KNOW) (XX)
- And a lot of schools only see certain problems, they see garbage and they see deforestation. And they only see certain solutions for that—sending the kids to pick up garbage or planting trees. And they don't see the realm of planting trees that includes finding the seeds, finding the bags, finding the dirt, taking care of it, then planting it, then taking care of it afterwards. They just see getting the tree, sticking it in the ground, then going away. And the same with the garbage—they just see picking up garbage, they don't see talking to people, having the kids investigate how to make natural fertilizers, composting. (VI, 3, 4) (6.KNOW) (XX)
- And a lot of people don't have that knowledge that what it's for. They think it's just to get these 60 hours out of the way, work the kids in the school or work them around the school. And one teacher is responsible for thinking up what they're going to do. (VI, 3, 4) (6.KNOW) (XX)
- It's just the teachers don't know how to do it, and also the kids are really separate from the project. Teachers and principals don't have any consciousness, they don't know what is environmental education, nor do they care. (VI, 3, 4) (6.KNOW) (XX)

- Yeah, he was told he was to give me a counterpart so he got me the woman who is in charge of the market. She doesn't know what's going on in forestry, nor does she care. (VI, 3, 8) (6.KNOW) (XX)
- When you ask [the teachers], "How long does it take plastic to decompose?" They'll say, "Two days." And you'll respond, "But you have a plastic cup in your house and how long has it been sitting on the table?" They seriously don't have the knowledge about a lot of areas. (VI, 4, 5) (6.KNOW) (XX)
- She said the first thing you'll probably ask a student in Carazo is, "What do you think is environmental education?" Another problem is that with the 60 hours of ecological work a lot of people are left to the mayor's office and they're doing street clean up and stuff like that because the teachers don't know what to make them do. (IV, 20, 5) (6.KNOW) (6.INT)
- He says that one of the main problems is that people here don't know what environmental education is and he says that a lot of things don't work out because they think it's only collecting, picking up garbage or working in a farm with the nuns . . . (V, 23, 4) (6.KNOW) (1.SENS)
- He says that he's been trying to explain to them that environmental education is not just picking up garbage or planting a tree—it's working in your neighborhood and community . . . (V, 23, 4) (6.KNOW) (XX)
- He says that the biggest problem is that people don't know what environmental education is. When they hear that's what it is, they just think about picking up trash and planting trees. (V, 23, 5) (6.KNOW) (10.KNOW)

6.LINT = lack of interest on the part of the leaders

- The mayor's office was to take it over after a year and they were supposed to keep running it. But as it turned out, the mayor hadn't decided on anybody to do the tree nursery, let alone have anyone who had any idea what was going on with the tree nursery. So, lack of a knowledge of what was a tree nursery and what went into making a tree nursery and what went into running a tree nursery. (VI, 3, 1) (6.LINT) (XX)
- It kind of turned out that I was doing the tree nursery on my own because nobody knew what was going on, nor did they really care. (VI, 3, 1) (6.LINT) (XX)
- When [the Germans and ADECA] moved out they wrote the property over to the mayor's office and the mayor had little or no interest in running the tree nursery. (VI, 3, 1) (6.LINT) (XX)

- Then the mayor's office decided to clear out the tree nursery. So, they cleared it out and I just moved on because I didn't find anybody to support the project—nobody was going to lead it, nor did they care. (VI, 3, 2) (6.LINT) (XX)
- Anybody who wanted to come talk and try to find solutions about it could come—instead of always inviting the head of MARENA and the head of the schools—because you're getting people who are supposed to be interested in it but most of the time they're not. And they have a zillion other things going on and so they're not really ... you know, they might be interested in the problem of sewage waters around Diriamba, but that's such a big problem that if they like concentrate on one area at a time. (VI, 3, 5) (6.LINT) (XX)
- [ADECA] as far as sustainable environmental education that will actually change the situation of Diriamba or Carazo, I don't believe they've been effective. Basically, I think they're just keeping themselves going on what money they get and so I don't think they have a real interest in the environment or a long-term strategic plan. They don't have a sustainable plan. They have projects, we'll do this project, we'll get done with it, we'll move to the next project. And they're a little bit concerned ... like, personally, I think they're concerned that their projects go on. Like I think that they would love to see them continue but when they fall apart, they're not really that upset about it because they've got a new project they're working on, they have to worry about. (VI, 3, 6) (6.LINT) (XX)
- Yeah, he was told he was to give me a counterpart so he got me the woman who is in charge of the market. She doesn't know what's going on in forestry, nor does she care. (VI, 3, 8) (6.LINT) (XX)
- We have a little bit of a problem with punctuality and attendance. For example we'll get some people to show up for one [commission] meeting, but they won't show up for the next so it's kind of off and on. (VI, 4, 2) (6.LINT) (XX)
- The problem may be more of a teacher nature. For example, lack of discipline was present in 6th grade (interfering with giving charlas). I had a problem with finding teachers who wanted to work with me and weren't just expecting a circus show every once in awhile. (VI, 4, 3) (6.LINT) (XX)
- I think the problem is with education, they're just not really into the program. The teachers here are really struggling—just to meet all the requirements of the other programs. I've seen a lot of really interested teachers and a lot of really disinterested teachers, but there's not much in between. (VI, 4, 4) (6.LINT) (XX)

- A lot of stuff that I do kind of ends up at a dead end and I have to skirt my way around it. It took about three months for me to find teachers to work with because I was just driving myself crazy because I was working with the wrong teachers and they didn't have any interest in the program. I was trying to explain to them "This isn't my program. I'm not going to live here for the next 20 years and do this in your school." I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just 3rd and 4th graders and just picking out the really good teachers. (VI, 4, 8) (6.LINT) (6.COUN; 6.FOR)
- Another volunteer lives across the road from me and she has a lot more problems—I think because her school is larger and teachers aren't that interested in working. They're not as involved with the community and with the students' lives. (VI, 12, 2) (6.LINT) (6.CONN)
- Teachers need to be encouraged by directors and technicians to implement experiments, games, nature walks, guest community speakers, etc. into the classes. (VI, 12, 6) (6.LINT) (XX)

6.LTIME = lack of time (leader)

- So, the kids liked the idea of working on the weekends—they always participated then. But as Peace Corps, we need to work with other Nicaraguans—and I couldn't get the teachers to do it. Well, I got one teacher to do it maybe two or three Saturdays and that was all and he no longer wanted to do it. He resigned from being the Brigada leader. (VI, 3, 2) (6.LTIME) (XX)
- And the schools are the same thing, all the teachers have a million classes, they don't get paid very much, they have certain hours, their principals have a million other things. (VI, 3, 6) (6.LTIME) (XX)

6.ONE = one shot projects

- At this point, there is no guarantee to ensure training continues for new employees – it depends on the government continuing to support the office after GreenCOM is gone—hoping for the multiplier effect to occur but not formally incorporated into the workshop design (i.e. recently, a ranger who participated in a training approached Nina wanting to conduct their own workshop for their park personnel) (VI, 2, 4) (6.ONE) (6.FOR; 6.FOL)

6.PINT = program itself isn't interesting/locally applicable

- The only problem with it is that it touches on different topics, but it isn't very specific to conditions/problems in the area and it's not very interesting. It's kind of boring. With the charlas [talks] I give, I try to turn them into something they'll remember a lot more. (VI, 4, 4) (6.PINT) (XX)

6.PLAN = lack of long-term plan

6.SCH = working *only* in school grounds

- Like, if MARENA were having an activity, the teacher would call the kids on the list and tell them they were having this activity. Or, they might do one little project in the school but, rarely ever did they have meetings where the whole brigade would get together and discuss what problems there were and what they would do about them or would they have projects. (VI, 3, 2) (6.SCH) (XX)
- So if [the Ecological Brigade] did activities, it was just within the school like putting up posters to clean up the school or cleaning up the school themselves or maybe planting some trees, but within the school grounds and within school hours. (VI, 3, 2) (6.SCH) (XX)
- "We had to go clean up trash." But that's not environmental education. They're not getting any consciousness of what's going on, they're not learning anything about the environment or what its needs are and what their place in taking care of it is. They're just learning that they have to get their 60 hours out of the way so they can graduate and that includes going and picking up garbage on Saturday or planting a tree which they don't even care about seeing if they can grow the tree. They just plant it and then they leave and if it dries up, it dries up. (VI, 3, 7) (6.SCH) (XX)
- Some of the seniors who are just getting ready to graduate from high school, they have put a fence around the trees around the area and they have planted about 2,000 trees. (VII, 10, 2) (6.SCH) (2.TREE; 2.SCH; 2.REF)
- [I'm] responsible of a certain area of the ecological activities of the school and so [I] had the support of some other teachers in the school and they have like a special kind of banner and they give her an award to the school room that is cleaner so they promote the activities to clean the school and once a month they give the special banner, the "banner ecologica," so they have been promoting that. (10, EP) (6.SCH) (2.SCH)

6.TIME = lack of time (participant)

- They feel EE is important, but they just can't decide where to stick it in the education program, and that's a big problem right there. We've been using Orientacion Laborale of the 3rd grade for quite awhile now in Arlen Siu because usually the kids just end up drawing things, so we've been turning it into an EE program. In the higher grades, nobody knows where to stick it. They're getting into the harder core science and they don't seem to really have room in the curriculum—they don't have really any good, solid programs. (VI, 4, 6) (6.TIME) (10.TIME)
- . . . unfortunately those teachers who are in charge of those 60 hours don't get paid any extra and, unless they get paid, they're not going to do any kind of programs of that sort, that would invest more time. It's easier for them to just have kids pick up garbage for those 60 hours. And the others that might be interested in it are involved in so many other things and don't have the time for it. (V, 23, 4) (6.TIME) (6.\$)

6.TNG = lack of educator training

- Like they're supposed to show the kids how to make a tree nursery, how to collect seeds and a lot of them don't because a lot of these things, they don't know how to do so they just have this book and they just pass over that or they check it off and say, "We've done it" and they've really done a half-assed job, they just kind of halfway did it or they had each kid plant a watermelon seed and that was their forest project or whatever. (VI, 3, 4) (6.TNG) (XX)
- The problem is that the teachers don't know what environmental work is. The principals don't—they think it's painting the stadium or making a place look pretty. They don't understand that it's something to better the environment, that it doesn't necessarily mean that you have to pick up trash, that you could do a community education project and you can get the kids involved in it. (VI, 3, 4) (6.TNG) (XX)
- There's no training set up by MED, there's no training set up by MARENA. (VI, 3, 8) (6.TNG) (XX)
- I think a big problem in education is ineffective teaching methods (including "by example"—it's frustrating when the teachers throw trash in the street after school clean-ups). A teacher I worked with in La Paz was copying lengthy paragraphs out of the book and said "Okay kids, let's copy this." It just didn't have any effect on the kids. Instead, he could give

charlas [talks], taking the trash, burying it, and digging it up two months later. They don't think about it. (VI, 4, 5) (6.TNG) (10.TNG)

- It's really hard—you literally have to sit here and tell people how to do things. I've tried to get the teacher to do some of the activities on her own. I tell her I get these pieces of paper and they say do this activity and I read it and I say I'm going to do this activity and then do it—and she thinks I'm some kind of magic person because somehow I can. And they're all in Spanish. I give it to her and ask if she wants to introduce the activity and she looks at it and acts as if it's a foreign language. I'm not sure what it is—I guess they just kind of feel they have to have some kind of special training to do it. I did go to an in-service training with the teachers and it was pretty interesting how much time we wasted not really doing much. (VI, 4, 6) (6.TNG) (9.INS)

7. Successes with environmental education projects currently under way

7.\$ = providing funding for environmental education programs or projects

- Like, you could say ADECA has been effective because they have gotten money to do things in environmental work. (VI, 3, 6) (7.\$) (XX)

7.COM = work being done in the community

- I got one of the brigades to work a few Saturdays we did some things in the community ... on some projects. (VI, 3, 2) (7.COM) (XX)
- But I figured that if people are interested in learning about [solar ovens] and it's some kind of knowledge that I know, and they're interested enough to organize themselves, I'll teach it to them and then if they're going to use it tomorrow or maybe use it three years down the road, at least they'll have the knowledge and they have an alternative. (VI, 3, 3) (7.COM) (XX)
- They're also on a reforestation project of Rio Dulce Nombre. On Saturdays, the students and the commission go out into the area and they do interviews. They're trying to think of an EE plan to work with the population to find a way to clean up the river area. (III, 17, 2) (7.COM) (8.12; 8.GOV; 2.REF)
- Her job has been organizing commissions in the different areas in Carazo and helping the rural areas, places called "comarques" which are the small communities outside of the urban area, to form their own commissions so they can work within their own community. So,

mainly working with this with MARENA and with myself. She's trying to give incentive to these people to solve their own problems. (V, 18, 1) (7.COM) (14.MARENA; 2.CMS)

- The people that are participating in this include herself and [FUNCOD doesn't] have any of [its] own programs or projects—[FUNCOD] always [helps] with other partners in projects. Their focus is students, teachers, producers, community members, focusing on getting them all to work together and trying to get everybody involved to solve their environmental problems of their area. (V, 18, 2) (7.COM) (XX)
- For example, some people who are working with the forestry, they know about nurseries and they can do something to change the technical way to lead the class and try to prepare a very easy and understandable paper or pamphlet to go to the people. In this proposal, we set out a diagnosis of the problems in this area in order to develop the government for the children because we were working to the families too in order that they will see these environmental problems and relate to them. (VIII, 19, 2) (7.COM) (2.TEC)

7.SCH = work being done in schools (on grounds, in building)

- [The brigades mainly work] just in the schools. Mainly, I found that the brigades were a list of kids that were in the brigade. Their projects—they didn't have any. They would just get together when they were having an activity. (VI, 3, 2) (7.SCH) (XX)
- Laura and Jen can be effective because they're working one on one with the teachers and that's why a lot of people now are moving away from forestation projects and moving away from working with MARENA and the mayor's offices and are working straight with the schools in the formal sector. Because they have the network set up and they have somebody that supposedly is responsible for it so like when you work with a teacher for two years teaching them how to incorporate environmental education into their work plan, then they have their work plan written up probably they're going to continue using that work plan with the next year's block. They're going to see, they're going to have worked out the games, they're going to have worked up the activities, they're going to see it's easier for them with this all planned out, and that they can complete what MED has signed up for them. So I believe that those kind of people are going to be effective in their work in Peace Corps—the ones who are working directly with teachers because that's the one that has a counterpart or a real person that that's the teachers responsibility—they have to get that done and they're interested in doing it or partially interested in doing it. (VI, 3, 9) (7.SCH) (2.K12; 7.STU)

7.STU = students are involved

- As it turned out, I worked with some kids on the [tree nursery/ADECA] project. They were really into it—volunteers ... They were in high school—volunteers between the ages of 13 and 23. They worked on it, on the tree nursery, helping me out until the trees got to be about a month old. (VI, 3, 2) (7.STU) (XX)
- So, the [ecological brigade] kids liked the idea of working on the weekends. They always participated then. (VI, 3, 2) (7.STU) (XX)
- Laura and Jen can be effective because they're working one on one with the teachers and that's why a lot of people now are moving away from forestation projects and moving away from working with MARENA and the mayor's offices and are working straight with the schools in the formal sector. Because they have the network set up and they have somebody that supposedly is responsible for it so like when you work with a teacher for two years teaching them how to incorporate environmental education into their work plan, then they have their work plan written up probably they're going to continue using that work plan with the next year's block. They're going to see, they're going to have worked out the games, they're going to have worked up the activities, they're going to see it's easier for them with this all planned out, and that they can complete what MED has signed up for them. So I believe that those kind of people are going to be effective in their work in Peace Corps—the ones who are working directly with teachers because that's the one that has a counterpart or a real person that that's the teachers responsibility—they have to get that done and they're interested in doing it or partially interested in doing it. (VI, 3, 9) (7.STU) (2.K12; 7.SCH)
- For example, 4 months ago I visited a volunteer and we were talking in the common area of a rural community—300 km. from Managua. A second year high school student was serving us food and I asked “What would you like to study?” and it was not intentional at all. What I really was wondering was is she was thinking of continuing her education. She said “What I really like is working with the environment and working with the trees—learning about the trees and what to do with the trees.” and I said “Botany?” and she said yes. I know this is because she has received some of the dynamics from the volunteer because I'm sure if I had asked that question 2 years ago, she wouldn't have said that—probably that she wanted to study but not something about the environment. (VI, 13, 7) (7.STU) (XX)
- We made a mark for ourselves with the exhibit that allows the students to get to know the objectives of the museum. The students participate voluntarily. [It] explains the reasons why the museum stayed in this municipality. It asks the students to identify which are the

principal environmental problems and where they come from and explains to them what the solutions can be and ultimately they learn to differentiate the different types of forests and their animal and plant species. (IX, 14, 2) (7.STU) (2.K12)

- For example, he said the students from Juan XXIII won the national contest last year with a paper and research on how to save the water source that we talked about earlier. It was applauded by a lot of organizations and groups but wrote up a mini-project but they haven't gotten an answer as far as where their funds are coming from to do it. They are looking for materials to start the project around here. They had thought about planting some trees but since the rains haven't started yet they haven't started with that and they're waiting for winter to set in so that they can have the trees in a stable state. (III, 17, 2) (7.STU) (2.STU)
- In El Rosario, they also have a good mix. They have people from the health department that are also in the commission. (V, 23, 9) (7.STU) (2.CMS; 7.LOC)
- In La Conquista [on the environmental commission], there's also a good mix of students and health workers so each commission has a mix of members that's a little bit different. (V, 23, 10) (7.STU) (2.CMS; 7.LOC)

7.TEACH = teachers are involved in environmental education projects/training

- I definitely think it just takes picking out some of the best teachers or working with just one school level—like maybe working with just 3rd and 4th graders and just picking out the really good teachers. Like the teacher I'm working with now, she was named the best [teacher] of the semester so I was pretty excited about that and thought I must be on the right track. It seems to work because, ever since I've been working with her, she's got her friend who is another 3rd grade teacher and says, "I want you to do the same things in my class because we do everything together." and then I had the 1st grade teachers come up to me and say "We've been watching the 3rd grade class and we want our students to have love of the environment." I just hope everybody doesn't jump on the bandwagon because I'm only one person. (VI, 4, 8) (7.TEACH) (XX)
- So, I'd say that's the best way to get programs to work—to ask for volunteers or to target teachers that the school identifies as being willing to take on the extra work. Like, my teacher stays after hours and stays after class. They stay at the school all day Friday until 5:30 and plan. (VI, 4, 8) (7.TEACH) (XX)
- She said that [MAN has] had 8 workshops and they know that isn't very many but they had some basic goals before they went into the workshops. They wanted to have them in areas

where MAN was already present and also they wanted to make sure that the professors and school district had interest in the project. She wanted to make sure that all the professors were volunteers because she was saying that they don't get paid very much so she didn't want to make it a requisite that they participate in those things so that they're all volunteers. She wants to make sure that they have a lot of interest and that they like it. They have had the most success in the Masaya region where they have done 3 workshops in 44 schools. She finds that they have a lot of interest because they have a laguna there and they have a lot of "agua negras"—polluted waters. So, they've had a lot of interest in the Masaya area. They have done some in Puerto Sandino—another area—but there they just gave their ideas and that was it. They've also done some in the Matagalpa but they found that they've gotten the most support in Masaya. (IV, 20, 3) (2.TTNG) (9.WRK; 7.TEACH)

7.WRK = community organizing workshops

- But I figured that if people are interested in learning about [solar ovens] and it's some kind of knowledge that I know, and they're interested enough to organize themselves, I'll teach it to them and then if they're going to use it tomorrow or maybe use it three years down the road, at least they'll have the knowledge and they have an alternative. (VI, 3, 3) (7.WRK) (XX)

8. Participants in environmental education projects currently under way

8.12 = junior high and high school students (7th through 12th grade)

- One of the good things is that the government passed a law that high school students, in order to graduate, they have to donate 60 hours of their time to ecological social service. Must get involved with ecological activities and must get the permission of the Ministry of Health and Ministry of Education and approval of the institution. (II, 1, 8) (8.12) (XX)
- As it turned out, I worked with some kids on the [tree nursery/ADECA] project. They were really into it—volunteers They were in high school—volunteers between the ages of 13 and 23. They worked on it, on the tree nursery, helping me out until the trees got to be about a month old. (VI, 3, 2) (8.12) (XX)
- So, I tried to find some people that wanted to do things in the community and that's when we formed the Municipal Brigade, which is some kids in high school but most are either in their last year or they're in the university. (VI, 3, 2) (8.12) (XX)

- Formally, I would say that would be in the schools—supposedly they have 60 hours as part of their environmental education and what’s written up in the MED books. (VI, 3, 6) (8.12) (XX)
- At Volcan Masaya, they see schools almost every day. Usual visitation rate per day is about 300 students although some days it is as high as 800. Some trips are pre-planned while others just show up—the cost is a bit higher for schools who show up when they’re not on the schedule. Have a big schedule so it is rather well planned out which schools are coming on what days. Pretty well set in the way they deal with school groups. The kids arrive and sit down for a 15 minute talk from a ranger about volcano ecology and the park. They then receive a guided tour through the visitors center with the ranger explaining a bit about each exhibit—quality varies with the ranger—some are very good and know a lot about the park. If requested, shown a 20 minute slide show about the park—pretty well done. Then go walk around the crater area or have a guided tour through the lava caves. (VI, 2, 6) (8.12) (8.K; 2.PK)
- However, this is not typical. For example, in the Chacocente/La Flor protected area visits to protected area only from local schools because there isn’t much capacity for school groups. No real visitors center or formal school programs at most other parks/protected areas besides Volcan Masaya. (VI, 2, 6) (8.12) (2.K12; 2.PK; 8.K)
- The way it stands right now on the itinerary, the Ecological Brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash recollection is every Friday and that people have to pay \$6 a month for it. If they don’t want to pay for it, they have to take it out to the site to dump it. We’re going to get this program going, and the Alcadia is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (8.12) (2.COMP; 2.TRAS; 8.COMM)
- Is [the MARENA national framework] working in the school area or more in non-formal education? V: Formal, non-formal, and informal. The strategy is in all three areas. (I, 5, 3) (8.12) (8.K; 8.COMM)
- So, from the information from this conference, you’re using that to put together your strategic plan? VB: Yes, but so far we are not happy with the document we have right now. We’re not happy but we’ll try to change, to improve what we have in order to send it to the reports—for national consultancy. NA: And the parts of the strategic plan, they’re addressing which areas of environmental education? VB: Formal education, non-formal education and informal education—to teach the strategy that tries to define actions for the

schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (8.12) (8.K; 2.NATL; 8.COMM; 8.UNIV; 8.MD)

- Within this institution, we have had a variety of programs with the youth of Nicaragua in what is called “Brigadas Ecologicas Municipales” (BEM)—Municipal Ecological Brigades. BEM are very popular and have had many good results. (I, 8, 1) (8.12) (2.BRIG)
- She says that one of the two most important things they’re involved with as far as the environmental education theme or issue is the organization of the ecological brigades at the primary level and also the ecological social service that the students at the secondary level need that as a requisite to graduate. So that’s one of the most important things that she thinks that are being imposed by the Ministry of Education. (I, 11, 2) (8.12) (2.ECO; 8.K; 2.BRIG)
- From the beginning of preschool and primary school they address several issues and at those stages of the education curriculum, the students are taught how to separate and classify solid waste and so on and as they advance to the secondary level some other more complex issues are addressed like environmental pollution, loss of habitat and the loss of several species of flora and fauna. And that’s about the way they go about it—from the most simple things in the early school days to the most complex things as they go on to the secondary level. (I, 11, 3) (8.12) (2.CURR; 8.K; 2.K12)
- She said that besides what’s contemplated in the curriculum, they’re trying to promote and to make the students aware of some extra-curricular activities that they have to do in order to get involved in these environmental issues—not as an obligation but making them feel the need of it. It comes as a niche—that they don’t feel obliged but that they see the need and they do it at their own initiative. (I, 11, 4) (8.12) (8.K; 2.XC)
- Our principal users are the primary and secondary students from both urban and rural zones and we think it should be directed more towards the rural children because they are the future caretakers of the countryside. (IX, 14, 1) (8.12) (2.K12, 8.K)
- In the national MED program, the majority of the focus is in the natural sciences. In the 4th grade the students study soil and water conservation. In the 6th grade they study 20 hours of flora and fauna preservation, preservation of wildlife areas, water, soil, and air, and also learn about gardening. In secondary school the students in 5th year learn the general ideas of the environmental laws, and the basic concepts of environmental management. They have sections focused on ecosystems, relations between humans and ecosystems, and the 60 hours

of ecological work in order to receive their bachelor's diplomas. (II, 16, 2) (8.12) (8.K, 2.K12, 2.ECO)

- They're also on a reforestation project of Rio Dulce Nombre. On Saturdays, the students and the commission go out into the area and they do interviews. They're trying to think of an EE plan to work with the population to find a way to clean up the river area. (III, 17, 2) (8.12) (2.REF; 8.GOV; 7.COM)
- They are also working in the River Dulce Nombre and they're working in a triangle with the students, the commission and the Alcaldia and he's part of each of those things so that he feels he's able to work because he can help the students have a good time and also understand about environmental work and what needs to be done. He feels he dominates the problems and he knows about each part of that triangle that does work so he can make all three parts of it work together. (III, 17, 2) (8.12) (8.GOV)

8.AG = agricultural producers

- [Peace Corps volunteers] also work in non-formal education through the agricultural producers. That component of our program is a lot smaller than EE—the only reason for that is that it is very difficult to find organized groups of farmers where we can target and work very efficiently with them so at the beginning of this program (2 years old) we started with half of the volunteers working in formal and half in non-formal. (VI, 13, 5) (8.AG) (2.TEC; 6.COORD)

8.COM = community members

- So, I tried to find some people that wanted to do things in the community and that's when we formed the Municipal Brigade which is some kids in high school but most are either in their last year or they're in the university. (VI, 3, 2) (8.COM) (XX)
- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.COM) (2.INT; 8.TEACH; 8.GOVT; 8.NGO; 8.PRIV)

- Another one of our major components is a visitor's study at Volcan Masaya National Park. We're implementing a visitor services survey in order to define visitor characteristics to Volcan Masaya National Park. [We] created a survey which will be administered by a local-hire assistant over the next 9 months. Describing where the visitors are from, length of stay in the park, how many times they have been to the park, what kind of information and interpretation they received, and their satisfaction with the experience. (Provided copy of survey in English and Spanish). Once the results are back and tabulated, hoping to use them to improve the quality of visit to Volcan Masaya. Will work to design interpretive programs and services according to the visitor needs. (VI, 2, 5) (8.COM) (2.STU)
- Research design [in Chacocente/La Flor] created by GreenCOM with involvement by local people and protected area personnel but research itself being conducted by an independent local contractor. (VI, 2, 5) (8.COM) (2.STU)
- Our indirect audience, those who we are producing materials for are buffer zone residents and visitors/tourists to the protected areas. (VI, 2, 6) (8.COM) (XX)
- The way it stands right now on the itinerary, the Ecological Brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash recollection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the Alcaldia [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (8.COM) (2.COMP; 2.TRAS; 2.BRIG; 8.12; 14.ALC)
- With the pila septica—the holes for the dirty [sewage] water—we've already given the charlas [talks] to the brigade and the brigade is going to teach the people how to do it in small groups. They're going to pick small groups of people that need them and then they're going to work together and build one in one patio and then go the next patio and build one. You have to get the people involved. It's kind of missing the point if you don't have them involved. If you tell them the Alcaldia [mayor's office] has donated materials and this organization has donated this and this organization has donated that so we're going through these holes in the ground for you—please throw your dirty water in it. It just doesn't mean as much as them going out there and actually making the hole and putting it in there and understanding what it's for, understanding how it works. (VI, 4, 10) (8.COM) (8.K; 2.SW; 7.LOC)

- Is [the MARENA national framework] working in the school area or more in non-formal education? V: Formal, non-formal, and informal. The strategy is in all three areas. (I, 5, 3) (8.COM) (8.12; 8.K)
- So, from the information from this conference, you're using that to put together your strategic plan. VB: Yes, but so far we are not happy with the document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. NA: And the parts of the strategic plan, they're addressing which areas of environmental education? VB: Formal education, non-formal education and informal education—to teach the strategy that tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (8.COM) (8.K; 8.12; 2.NATL; 8.UNIV; 8.MD)
- In the commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and communal leaders, etc. This is partner organizations helping the environment. The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.COM) (8.GOV; 8.NGO; 8.PRIV)
- We consider we are working with adults as well because we target the teachers and sometimes the parents too. (VI, 13, 4) (8.COM) (XX)

8.GOV = government employees and organizations

- Ministry of Education, local NGOs are also involved [in environmental commissions]. Last Friday, commission meeting for one county, 60 people attended, local NGOs, governmental representatives. (II, 1, 3) (8.GOV) (XX)
- Held a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives (II, 1, 8) (8.GOV) (XX)
- And this is what I see the possibility of the commission doing—is being able to start off with that, with some kind of meeting project where they go around and do that with each neighborhood and finding the neighborhoods that have serious problems that they want to solve. I think that's what the commission's job is. But right now they see themselves as figuring out the problem, figuring out the solution, making the project and finding the resources, and that's just, like some people have come to the commission meetings with

projects and they have this letters that says, "We would like to do this project. It will cost this." (VI, 3, 5) (8.GOV) (XX)

- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.GOV) (2.INT; 8.TEACH; 8.COM; 8.NGO; 8.PRIV)
- You said you created an EE commission—is that here in El Rosario? JB: Yes, it's coordination between sectors/representatives of the population to find rapid solutions to environmental problems. We have a department of Carazo regional meeting every month, and they were pushing people to form environmental commissions in each area so Santa Theresa has one, El Rosario has one, Diriamba has one—just about all of the municipalities have one. (VI, 4, 2) (8.GOV) (2.CMS)
- For example, with the environmental commission, things opened up so much better because the Centro de Salud [health center] was actually talking to/working with the Alcaldia [mayor's office] on all these problems—it wasn't like everyone was running around and trying to solve these problems in their own way. (VI, 4, 3) (8.GOV) (XX)
- We had government and NGO participants [at the National EE Conference], environmental educators, a few teachers, more people working in EE projects or NGOs. (I, 5, 7) (8.GOV) (8.TEACH; 8.NGO)
- In the commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and community leaders, etc. These are partner organizations helping the environment. The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.GOV) (8.COM; 8.NGO; 8.PRIV)
- They're also on a reforestation project of Rio Dulce Nombre. On Saturdays, the students and the commission go out into the area and they do interviews. They're trying to think of an EE plan to work with the population to find a way to clean up the river area. (III, 17, 2) (8.GOV) (8.12; 2.REF; 7.COM)

- They are also working in the River Dulce Nombre and they're working in a triangle with the students, the commission and the Alcadia and he's part of each of those things so that he feels he's able to work because he can help the students have a good time and also understand about environmental work and what needs to be done. He feels he dominates the problems and he knows about each part of that triangle that does work so he can make all three parts of it work together. (III, 17, 2) (8.GOV) (8.12)

8.K = elementary school students (through 6th grade)

- At Volcan Masaya, they see schools almost every day. Usual visitation rate per day is about 300 students although some days it is as high as 800. Some trips are pre-planned while others just show up—the cost is a bit higher for schools who show up when they're not on the schedule. Have a big schedule so it is rather well planned out which schools are coming on what days. Pretty well set in the way they deal with school groups—the kids arrive and sit down for a 15 minute talk from a ranger about volcano ecology and the park. They then receive a guided tour through the visitors center with the ranger explaining a bit about each exhibit—quality varies with the ranger. Some are very good and know a lot about the park. If requested, shown a 20 minute slide show about the park—pretty well done. Then go walk around the crater area or have a guided tour through the lava caves. (VI, 2, 6) (8.K) (2.PK; 8.12)
- However, this is not typical. For example, in the Chacocente/La Flor protected area visits to protected area only from local schools because there isn't much capacity for school groups—no real visitors center or formal school programs at most other parks/protected areas besides Volcan Masaya. (VI, 2, 6) (8.K) (2.K12; 2.PK; 8.12)
- What grade or grades is the school? JB: Primary—1st through 6th and, in the case of Arlen Siu in El Rosario, 7th and 9th occupy the school in the afternoon. So, basically, I've had a lot of problems working with the 5th and 6th grade classes. It's hard to explain but they seem to be almost beyond the helping point. I haven't really gotten positive feedback from the 5th and 6th grade classes at all. Many of the activities in our guides say 1st through 6th but it's really open to interpretation because a lot of them, the 6th graders don't want to do. I think that 3rd/4th grade has turned out to be the key because I work with 4th grade at Dulce Nombre and I work with 3rd grade at Arlen Siu (El Rosario). (VI, 4, 3) (8.K) (XX)
- In the trash charlas [talks] they have games between different groups, classifying trash and stuff. We try to put it into practice in the schools. Like in Arlen Siu, for our trash program,

we're going to dig two big holes basically, and we're going to deposit organic trash in one and inorganic in the other. (VI, 4, 4) (8.K) (2.SCH; 2.TRAS)

- With the pila septica—the holes for the dirty [sewage] water—we've already given the charlas [talks] to the brigade and the brigade is going to teach the people how to do it in small groups. They're going to pick small groups of people that need them and then they're going to work together and build one in one patio and then go the next patio and build one. You have to get the people involved. It's kind of missing the point if you don't have them involved. If you tell them the Alcaldia has donated materials and this organization has donated this and this organization has donated that so we're going to throw these holes in the ground for you—please throw your dirty water in it. It just doesn't mean as much as them going out there and actually making the hole and putting it in there and understanding what it's for, understanding how it works. (VI, 4, 10) (8.K) (2.SW; 8.COMM; 7.LOC)
- Is [the MARENA national framework] working in the school area or more in non-formal education? V: Formal, non-formal, and informal. The strategy is in all three areas. (I, 5, 3) (8.K) (8.12; 8.COMM)
- So, from the information from this conference, you're using that to put together your strategic plan. VB: Yes, but so far we are not happy with the document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. NA: And the parts of the strategic plan, they're addressing which areas of environmental education? VB: Formal education, non-formal education and informal education—to teach the strategy that tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (8.K) (2.NATL; 8.12; 8.COMM; 8.UNIV; 8.MD)
- One of the two most important things [MED is] involved with as far as the environmental education theme or issue is the organization of the ecological brigades at the primary level and also the ecological social service that the students at the secondary level need that as a requisite to graduate. So that's one of the most important things that [I think] are being imposed by the Ministry of Education. (I, 11, 2) (8.K) (2.ECO; 2.BRIG; 8.12)
- From the beginning of preschool and primary school they address several issues and at those stages of the education curriculum, the students are taught how to separate and classify solid waste and so on and as they advance to the secondary level some other more complex issues are addressed like environmental pollution, loss of habitat, and the loss of several species of

flora and fauna. And that's about the way they go about it—from the most simple things in the early school days to the most complex things as they go on to the secondary level. (I, 11, 3) (8.K) (2.CURR; 2.K12; 8.12)

- She said that besides what's contemplated in the curriculum, they're trying to promote and to make the students aware of some extra-curricular activities that they have to do in order to get involved in these environmental issues—not as an obligation but making them feel the need of it. It comes as a niche—that they don't feel obliged but that they see the need and they do it at their own initiative. (I, 11, 4) (8.K) (2.XC; 8.12)
- I work with 2 rural schools—they're barrios or small communities right outside of Jinotepe. I work with 4th through 6th grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. (VI, 12, 2) (8.K) (2.K12; 8.TEACH; 7.LOC)
- Currently, we're working on an overpopulation analysis for the community. We're splitting the kids up into groups so that they can go around and ask questions such as, "How many people live in this house? How many people have died in a certain amount of years? How much firewood and water do you use per day?" etc. We're going to make a population growth rate chart. A separate group is going around and asking about the resources—how much land is there, how much water is there, how much water does the community use per year. Then we will discuss how much longer we can continue at the current population growth rate. (VI, 12, 3) (8.K) (2.STU; 2.K12)
- We're trying to get together themes like garbage, deforestation, overpopulation, an introduction to environmental science, ecosystems, animals, different appreciations for environmental problems—and coming up with different projects—mostly outside of the classroom—going for walks, thinking about the adaptations of different animals and plants. (VI, 12, 3) (8.K) (2.K12)
- Working with schools through an agreement with the Minister of Education (MED), we are working on supporting school primary school teachers, mainly in rural communities, to incorporate EE which is in the curriculum but is not always implemented. We are doing that in different regions, covering almost all populated Nicaraguan regions. There is a curriculum transformation right now from first to third grade so they are doing/promoting active education and local knowledge and we are working from first through sixth grade so

not only including the first three grades who are working with MED but also the upper three grades. (VI, 13, 3) (8.K) (14.MED; 2.K12)

- We started working with 3 schools—one volunteer works with three schools. We work from 4th through 6th grade—that way we cover the grades not covered by MED with the transformation in the curriculum. So basically what the volunteers do is support the teachers to incorporate what in the curriculum into the classroom in a more active, using active methodology, using local knowledge from the students, and incorporating whatever environmental. Problems are happening and trying to find solutions where students can be involved. (VI, 13, 4) (8.K) (2.K12; 2.TTNG; 8.TEACH)
- We are basically promoting school nurseries using fruit trees forest and fuel trees and we are promoting a lot of fruit trees, trying to show the students that, if they would like to have fruits, they can grow them. They bring the seeds from their houses like mangoes or whatever is available and they have one or two plants and they use local resources and there are milk bags we use instead of buying plastic bags. In other places, we just have the nurseries without having bags so they will learn how to have the trees and how to grow them. (VI, 13, 4) (8.K) (2.TREE)
- At the beginning, during the first 6 or 7 months, [Peace Corps volunteers] give charlas [talks] directly to the students on different environmental topics like garbage, deforestation, topics that are important in their community. (VI, 13, 4) (8.K) (9.WRK; 2.K12; 1.SW; 1.DEF)
- We are working mainly in primary schools at this point. (VI, 13, 4) (8.K) (XX)
- What [the Peace Corps volunteer] did was using this to incorporate EE into the Nicaraguan curriculum. Now it [the curriculum guide] says for each course from 1st to 3rd grade what to do. (VI, 13, 9) (8.K) (XX)
- We have experienced through volunteers that, after high school, in general, youth want to have the rights of an adult but don't want to have the responsibilities so it is a little more difficult. We have really good results even with 1st grade—they love to plant trees. So, we'll see what happens in the future. (VI, 13, 13) (8.K) (XX)
- Our principal users are the primary and secondary students from both urban and rural zones and we think it should be directed more towards the rural children because they are the future caretakers of the countryside. (IX, 14, 1) (8.K) (2.K12, 8.12)
- In the national MED program, the majority of the focus is in the natural sciences. In the 4th grade the students study soil and water conservation. In the 6th grade they study 20 hours of flora and fauna preservation, preservation of wildlife areas, water, soil, and air, and also

learn about gardening. In secondary school the students in 5th year learn the general ideas of the environmental laws, and the basic concepts of environmental management. They have sections focused on ecosystems, relations between humans and ecosystems, and the 60 hours of ecological work in order to receive their bachelors diplomas. (II, 16, 2) (8.K) (2.K12, 8.12, 2.ECO)

8.MD = media

- So, from the information from this conference, you're using that to put together your strategic plan? VB: Yes, but so far we are not happy with the document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. NA: And the parts of the strategic plan, they're addressing which areas of environmental education? VB: Formal education, non-formal education and informal education—to teach the strategy that tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (8.MD) (8.K; 8.12; 8.COMM; 2.UNIV; 2.NATL)

8.NGO = non-governmental organizations/employees

- Ministry of Education, local NGOs are also involved [in environmental commissions]. Last Friday, commission meeting for one county, 60 people attended, local NGOs, governmental representatives. (II, 1, ?) (8.NGO) (XX)
- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.NGO) (2.INT; 8.TEACH; 8.GOVT; 8.COM; 8.PRIV)
- We had government and NGO participants [at the National EE Conference], environmental educators, a few teachers, more people working in EE projects or NGOs. (I, 5, 7) (8.NGO) (8.TEACH; 8.GOVT)
- In the Commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and communal leaders, etc. This is partner organizations

helping the environment. The Commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.NGO) (8.GOV'T; 8.COM; 8.PRIV)

8.PK = parks and protected area personnel

- Parks and protected areas personnel in MARENA—[GreenCOM's] counterpart. Also involving NGOs and private sector, particularly towns in sector (this is the direct audience). (VI, 2, 6) (8.PK) (XX)

8.PRIV = private sector

- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.PRIV) (2.INT; 8.TEACH; 8.GOV'T; 8.NGO; 8.COM)
- In the Commission, there is participation of government organizations and NGOs with presence in Diriamba, businesses and community leaders, etc. This is partner organizations helping the environment. The Commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (III, 9, 1) (8.PRIV) (8.GOV'T; 8.NGO; 8.COM)

8.TEACH = teachers

- Each protected area we work with forms an interagency work team consisting of governmental, NGO, private sector (tourism, for example), teachers and/or community leaders. One week training gives concepts in interpretive communication, including emphasis on behavior-change and social marketing techniques. Here is when they identify messages to communicate and choose the appropriate target audience. The team continues to work together through a guided practicum period. (VI, 2, 2) (8.TEACH) (2.INT; 8.COM; 8.GOV'T; 8.NGO; 8.PRIV)

- We had government and NGO participants [at the National EE Conference], environmental educators, a few teachers, more people working in EE projects or NGOs. (I, 5, 7) (8.TEACH) (8.GOV; 8.NGO)
- The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (XX,XX0) (8.TEACH) (15.SW; 15.CAM)
- I work with 2 rural schools. They're barrios or small communities right outside of Jinotepe. I work with 4th through 6th grade. I only work with the teachers that have come to me and asked me to work with them and that have some interest. We get together and plan games and activities to do with the kids before classes. I go to their houses or meet with them in the school to prepare activities. (VI, 12, 2) (8.TEACH) (2.K12; 8.K12; 7.LOC)
- Then we're going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas. (VI, 12, 3) (8.TEACH) (9.WRK; 2.TTNG)
- I think, in the Escuela Normal [normal school], they should incorporate teaching about the environment. I think they're doing that right now—they're teaching teachers how to raise viveros [tree nurseries], how to do composting—but I don't know if they're teaching about how to think about how animals adapt or how to make up experiments or do investigations of any kind. But it would be a good idea to teach how to encourage students to think for themselves. I think labs should be required in primary and secondary schools and a science fair could be implemented into the program. (VI, 12, 5) (8.TEACH) (2.TTNG; 11.PRE)
- I think there should also be more workshops—kind of like in-service training—have workshops teaching teachers new games all the time—just new projects and more getting together and networking between teachers. (VI, 12, 6) (8.TEACH) (11.TNG; 9.WRK)
- More getting together and networking between teachers. Get rural schools together with Jinotepe schools—like Guisquiliapea—urban teachers together with rural teachers to share ideas. (VI, 12, 6) (8.TEACH) (11.NET)
- In different courses, they start with natural science and have moved on to other courses and there are specific topics about the environment. What happened is that teachers don't receive the proper training so we are working on that, starting with natural science. (VI, 13, 3) (8.TEACH) (2.TTNG)

- [Peace Corps volunteers] started working with 3 schools—one volunteer works with three schools. We work from 4th through 6th grade—that way we cover the grades not covered by MED with the transformation in the curriculum so basically what the volunteers do is support the teachers to incorporate what in the curriculum into the classroom in a more active, using active methodology, using local knowledge from the students, and incorporating whatever environmental problems are happening and trying to find solutions where students can be involved. (VI, 13, 4) (8.TEACH) (2.K12; 8.K; 2.TTNG)
- After 7 months, when the teacher is aware that the dynamics are good—when they realize that the students remember better what they do rather than what they memorize and that they are using their creativity and local knowledge, they agree to start working with the volunteer in a planning process using the Nicaraguan curriculum. how to incorporate dynamics in those topics. The second year of the volunteer service, the teacher will do the dynamics -- at least once every week and the volunteers will support the teachers and help them. Teachers will lose or gain confidence in using dynamics in some activities and other classroom activities—using their curriculum because they don't want to spend time using other topics that are not covered by the curriculum. (VI, 13, 4) (8.TEACH) (2.TTNG)
- They will receive the manual after the training, that is what we normally do. They receive very basic training and they do the games at the charlas [talks]—the dynamics, the teachers learn how to use it and then discuss with the volunteers which grades the dynamics are appropriate for and what size group—some classes have more than 50 students and some dynamics don't work with this size—they have to adapt them. Then they receive the manual. (VI, 13, 10) (8.TEACH) (9.INS; 9.WRK)
- So what the teachers do right now, the volunteer explains to the teachers using paper on the wall summarizing the dynamic, they do it and they write it down with notes—what grades, how to do it, etc. We start doing that with 2 hours using MED training at the beginning of each year in February, for example (VI, 13, 10) (8.TEACH) (9.INS; 2.TTNG)
- They receive training every year before school starts from MED so the volunteer has 2 or more hours if the regional MED allows it. The volunteers will target not only the three school teachers they are working with but more than that—sometimes up to 30 teachers. (VI, 13, 10) (8.TEACH) (8.INS)
- The way we are approaching it is to explain to the teachers that volunteers are here to support them— not to give more work but to help them by doing a more active class, by giving them a more active class is less work for them and in the long term students have a

better long term understanding and better results, even in grades, because they remember longer. Because teachers feel that you have to prepare a lot to do these things with your class, the volunteer has to explain it's just thinking about what to do and using local materials like the same pens and papers they have and more imagination. Also, we work with the teachers that want to work with the volunteers. The ones that are not that enthusiastic, we just leave them alone and we'll come back to them later. This is also adult education, teaching to the teachers, and we know that we don't learn just by receiving information—we have to do it. After 7 months of watching the volunteers and seeing the results, the teachers realize that the students remember more what the volunteer is teaching and doing than what the teacher is doing so that's when we've convinced them—just by seeing it in the classroom. (VI, 13, 12) (8.TEACH) (2.TTNG; 9.DEM)

- For the last six months, [MAN has] been focusing on education in the schools and they have started with workshops for the teachers. They're trying to develop a guide book for teachers to use. They've been working with the schools that are supporters of MAN. It's like a pilot project that has been working with the guide book for three years and they started with the kids. The guide book is for the teachers and they've been using it in the schools for three years. (IV, 20, 1) (8.TEACH) (2.TTNG; 2.CURR; 2.K12)

8.UNIV = university professors and/or students

- So, from the information from this conference, you're using that to put together your strategic plan. VB: Yes, but so far we are not happy with the document we have right now. We're not happy but we'll try to change, to improve what we have in order to send it to the reports—for national consultancy. NA: And the parts of the strategic plan, they're addressing which areas of environmental education? VB: Formal education, non-formal education and informal education—to teach the strategy that tries to define actions for the schools and universities and for the communities, which is the non-formal education, and for the media communications—those three directions. (I, 6, 2) (8.UNIV) (8.K; 8.12; 8.COMM; 2.NATL; 8.MD)
- [Interviewer] Within Nicaragua, are there any universities that have EE as a degree or major? [Subject] No, but you find that in courses like “National Parks and Protected Areas” we use a lot of techniques from interpretation so in those there is an EE component but not like a course and seeing the different aspects—formal, non-formal, informal education, etc. (VI, 13, 8) (8.UNIV) (2.UNIV)

- [Interviewer] Which university would you say focuses the most on EE? If there were someone interested in EE, would they major in education and take science classes or would they major in science and take education classes? [Subject] I'll take something back, the UNAN, the national university which is the public one, they have a bachelor's degree focusing on biology for teaching so they receive the more formal education and a lot of them are working as teachers. They focus more on education than on regular sciences. (VI, 13, 8) (8.UNIV) (2.UNIV)

9. Methods of delivering information/programs

9.DEM = demonstrations

- had a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives (II, 1, 8) (9.DEM) (XX)
- Yeah, I do workshops and talks and demonstrations [on solar ovens], depending on what people want. (VI, 3, 2) (9.DEM) (XX)
- Like we had a few [solar oven] demonstrations for the press and they took pictures for the newspaper and stuff and a few people that were at these demonstrations with the press said that their neighborhoods would be interested so we went and gave free demonstrations in the neighborhoods and we took lists of people that would like to go to a workshop. (VI, 3, 3) (9.DEM) (XX)
- The way we are approaching it is to explain to the teachers that volunteers are here to support them—not to give more work but to help them by doing a more active class, by giving them a more active class is less work for them and in the long term students have a better long term understanding and better results, even in grades, because they remember longer. Because teachers feel that you have to prepare a lot to do these things with your class, the volunteer has to explain it's just thinking about what to do and using local materials like the same pens and papers they have and more imagination. Also, we work with the teachers that want to work with the volunteers. The ones that are not that enthusiastic, we just leave them alone and we'll come back to them later. This is also adult education, teaching to the teachers, and we know that we don't learn just by receiving information—we have to do it. After 7 months of watching the volunteers and seeing the results, the teachers realize that the students remember more what the volunteer is teaching

and doing than what the teacher is doing so that's when we've convinced them—just by seeing it in the classroom. (VI, 13, 12) (9.DEM) (8.TEACH; 2.TTNG)

9.INS = in-service training (K-12 teachers)

- But what they do is they sweep in, maybe an organization comes in and they're like, "Okay, we're going to focus on this, this year." And they give a talk and the teachers all learn about it and then they go away and it goes back to the way it was. (VI, 3, 7) (9.INS) (XX)
- I don't know if they'll have something planned for next year. Sometimes they give out a little pamphlet that tells them what they could do. Like they have a list of activities they could do with the kids. But they just think it's easier just to send them out here. (VI, 3, 8) (9.INS) (XX)
- I did go to an in-service training with the teachers and it was pretty interesting how much time we wasted not really doing much. (VI, 4, 6) (9.INS) (6.TNG)
- It was an in-service training for EE or just in general? JB: No, just in general but I did manage to slide some stuff about EE in there—but didn't really get a positive feedback. (VI, 4, 7) (9.INS) (XX)
- Was this the beginning of the year in-service training? JB: No, it was the end of semester—in July. I'm not sure what it is—I think there's pretty much two classes of teachers—the ones that really want to do it and the ones that really don't. The ones that really don't want anything else to add on to their workload. The ones that really want to do it are interested, but they just don't have the activities and the resources and stuff like that. (VI, 4, 7) (9.INS) (10.RES)
- I'll tell you what the teachers really like. They really like the teacher in-service trainings where an outside organization gives them and pays for it. They got into a big fight with MED because when they had the one in July, they said they were supposed to get more money to cover transportation and food... (VI, 4, 7) (9.INS) (2.TTNG; 11.TNG)
- They're going to work on a central, national strategy. There's not going to be a regional thing—it's going to be flexible, so you could adapt it to local conditions, to get at the local people as far as local needs are concerned, local resources are concerned to get this environmental education as an in-service training according to the circumstances and conditions of each community, of each locality and getting people that are interested and love environmental education, getting them involved in the environmental education strategies that are going to be implemented on the local levels, using of course the central

design as a guideline but not as a rigid framework but in a flexible way. (I, 11, 3) (9.INS) (15.NATL)

- They will receive the manual after the training, that is what we normally do. They receive very basic training and they do the games at the charlas [talks]—the dynamics, the teachers learn how to use it and then discuss with the volunteers which grades the dynamics are appropriate for and what size group—some classes have more than 50 students and some dynamics don't work with this size—they have to adapt them. Then they receive the manual. (VI, 13, 10) (9.INS) (9.WRK,8.TEACH)
- So what the teachers do right now, the volunteer explains to the teachers using paper on the wall summarizing the dynamic, they do it and they write it down with notes—what grades, how to do it, etc. We start doing that with 2 hours using MED training at the beginning of each year in February, for example. (VI, 13, 10) (9.INS) (2.TTNG; 8.TEACH)
- They receive training every year before school starts from MED so the volunteer has 2 or more hours if the regional MED allows it. The volunteers will target not only the three school teachers they are working with but more than that—sometimes up to 30 teachers. (VI, 13, 10) (9.INS) (8.TEACH)
- It is lack of resources and also, one that is indirect but is important is the salary that they make. Usually teachers are paid, on average, the equivalent to \$50/month and they work very hard. So , they don't have that incentive to get better. (VI, 13, 11) (9.INS) (2.TTNG; 14.MED; 9.PRE)

9.PRE = pre-service training (K-12 teachers)

- It is lack of resources and also, one that is indirect but is important is the salary that they make. Usually teachers are paid, on average, the equivalent to \$50/month and they work very hard. So , they don't have that incentive to get better. (VI, 13, 11) (9.PRE) (2.TTNG; 9.INS; 14.MED)

9.WRK = workshops

- We had a seminar on solar energy where we invited leaders from different areas to the department and gave a demonstration of different energy alternatives. (II, 1, 8) (9.WRK) (XX)
- Yeah, I do workshops and talks and demonstrations [on solar ovens], depending on what people want. (VI, 3, 2) (9.WRK) (XX)

- For instance with Dulce Nombres, which is a very small community (smaller than most of the others; and all they have is a school and a church), I've tried to take the environmental charlas [talks] and integrate them into the curriculum rather than create a brigade or mini-program. I can work "one-on-one" with the teachers there since it is smaller. (VI, 4, 3) (9.WRK) (4.EXP)
- Like we had a few demonstrations for the press and they took pictures for the newspaper and stuff and a few people that were at these demonstrations with the press said that their neighborhoods would be interested so we went and gave free demonstrations in the neighborhoods and we took lists of people that would like to go to a workshop. And then we held workshops. And then the second year, we were full with people calling us and asking us to come and give a workshop to a group of people that they had organized. (VI, 3, 3) (9.WRK) (XX)
- Then we're going to write all of our activities up and give workshops at the end of the semester to other teachers in the same grade—so maybe they can try to put it into their curriculum and implement our ideas and maybe add to our ideas. (VI, 12, 3) (9.WRK) (2.TTNG; 8.TEACH)
- I think there should also be more workshops—kind of like in-service training—have workshops teaching teachers new games all the time—just new projects and more getting together and networking between teachers. (VI, 12, 6) (9.WRK) (8.TEACH; 11.TNG)
- At the beginning, during the first 6 or 7 months, [the Peace Corps volunteers] give charlas [talks] directly to the students on different environmental topics like garbage, deforestation, topics that are important in their community. (VI, 13, 4) (9.WRK) (2.K12; 8.K; 1.SW; 1.DEF)
- It is used only by the Peace Corps volunteers because we don't have the money to use it with the teachers. I wrote a grant trying to find the funds but we didn't get it. We will have, in October, a group meeting of all EE volunteers to incorporate this—there is more information that they have developed—they will have one manual just in case we have the money in the future so hopefully the teachers will have them. We're planning to introduce this manual to the Minister of MED so he can lobby somewhere for the money. (VI, 13, 9) (9.WRK) (6.\$; 14.MED)
- They will receive the manual after the training, that is what we normally do. They receive very basic training and they do the games at the charlas [talks]—the dynamics, the teachers learn how to use it and then discuss with the volunteers which grades the dynamics are

appropriate for and what size group—some classes have more than 50 students and some dynamics don't work with this size—they have to adapt them. Then they receive the manual. (VI, 13, 10) (9.WRK) (9.INS; 8.TEACH)

- She'll show you the guide book afterwards but what they've been doing the last six months is they've been doing nation-wide workshops with teachers—using the guidebooks and trying to develop it better—trying to find out their inputs on it—if they want to have drawings or changes. (IV, 20, 2) (9.WRK) (2.TTNG)
- She said that [MAN has] had 8 workshops and they know that isn't very many but they had some basic goals before they went into the workshops. They wanted to have them in areas where MAN was already present and also they wanted to make sure that the professors and school district had interest in the project. She wanted to make sure that all the professors were volunteers because she was saying that they don't get paid very much so she didn't want to make it requisite that they participate in those workshops so that they're all volunteers. She wants to make sure that they have a lot of interest and that they like it. They have had the most success in the Masaya region where they have done 3 workshops in 44 schools. She finds that they have a lot of interest because they have a laguna there and they have a lot of "agua negras"—polluted waters. So, they've had a lot of interest in the Masaya area. They have done some in Puerto Sandino—another area—but there they just gave their ideas and that was it. They've also done some in the Matagalpa but they found that they've gotten the most support in Masaya. (IV, 20, 3) (9.WRK) (2.TTNG; 7.TEACH)
- I asked her how you get the materials if you want them, she said that when they do the workshops they supply all the materials. (IV, 20, 4) (9.WRK) (XX)

10. Greatest barriers to teaching environmental education in Carazo

10.\$ = lack of funding

- The barriers I first noticed when I got here were the teachers—I mean the teachers don't make much here. They really don't make enough money to support a family and a lot of them have second jobs which means they're leaving the school right after school and going to a second job. (VI, 4, 5) (10.\$) (10.TIME)
- Finding financing for projects is also a big barrier to environmental education. (V, 7, 1) (10.\$) (XX)

- The resources are very scarce and we should try to do more things. They have the science, and [I don't]—the salary they get is very little so the things [we] do—[we] don't do it because [we] want to get an economical reward but [we] do it because [we] want to have a more beautiful environment. We will have a more beautiful place as far as scenery, like Guatemala, and some of the rewards that [we] get is that [we] have the opportunity to go to some places with the school like Masaya, Mombacho, and some other places so that's the fact that's rewarding to [us]. (VII, 10, 4) (10.\$) (6.\$)
- One of the things [I desire] the most is to learn the English language but [I don't] have the resources to do it. As a matter of fact, the teachers salary was going to be increased but that the increase they were promised didn't come through. The primary school teacher gets \$40 a month and the secondary teacher gets \$60, a salary which is hard to live with And [I have] also elaborated some projects in order to improve the living conditions of some of the teachers that work with [me] at the school and [I have] been successful in finding some organizations who have given funds to improve the houses and other living conditions of some of the teachers who work there. (VII, 10, 5) (10.\$) (6.\$)
- It is lack of resources and also, one that is indirect but is important is the salary that they make. Usually teachers are paid, on average, the equivalent to \$50/month and they work very hard. So , they don't have that incentive to get better. (VI, 13, 11) (10.\$) (XX)
- Lack of environmental education resources. Almost all of the ministries and organizations at the municipal and departmental levels need a bigger budget in order to achieve all of their goals. (II, 16, 2) (10.\$) (10.RES)
- He said the biggest problem he sees is not having a basis in EE—not having it at all. The second part is economic factors. He said that with a good education, people tend to care more about environmental problems but if they don't have a good economic standing, a lot of the solutions they try to find don't work. (III, 17, 2) (10.\$) (XX)
- He would like if you would go back to Wisconsin and if you could work together—Nicaragua and Wisconsin—in this small part of his country. The people that have better material resources and have better access to these resources—they could help people in this area. Remember that the world is one and that whatever problems affect one area affect all of us. (III, 17, 3) (10.\$) (XX)
- [UNA has] been working with many programs and also working with a lot of farmers. They also demand from the university technical papers, more for the technical people and I think

we have a lot of information on what we've been doing for last five years but the way to produce it is a problem—it's a big problem for us. (VIII, 19, 3) (10.\$) (XX)

- Also, they don't have any help from the central government. They're missing human and material resources and it's hard to complete the projects they have in mind without the monetary resources. They need to have a specific fund dedicated to environmental problems and environmental education. (III, 21, 2) (10.\$) (10.RES; 10.GOV)
- He said he'd like to keep up communication with you. You might have contacts with some environmental or ecological groups that could help them out or give them a little aid in their projects they have been looking to develop. (III, 21, 2) (10.\$) (XX)
- She also believes another thing that limits them is instable politics of the state institutions and the ministries and financial problems. They don't have enough money to pay for pamphlets, videos, and, depending on the community, different ways to spread their messages. (II, 22, 2) (10.\$) (10.GOV; 10.RES)

10.CNG = lack of willingness to make a big change in current lifestyle

- It's just ... they know that the problems are deforestation but they'll be the first ones to say that they'd rather have their food cooked on firewood than on a gas stove because it has a better flavor. (VI, 3, 3) (10.CNG) (XX)

10.COMM = lack of total community involvement

- I guess one of the biggest helps, what we've been trying to target with my teacher in this school, is trying to get parents involved. I think one of the biggest problems right now (why programs aren't succeeding) is that the whole community isn't involved. We're trying to preach these things in the school, and his mother is throwing plastic bags out in the road and burning plastic bags in the backyard. The kid is thinking, "Well, in school today we learned that plastic bags are bad for the environment but my whole family is doing it so why do I need to change?" I think that's a big part of it. (VI, 4, 5-6) (10.COMM) (6.CONN)
- And [I believe] that if you go to MARENA you're wasting your time that they just write these things and send them out but they never come out here. It's very centralized and it only does work pretty much in Managua. And . . . if you want to go and be lied to and be won over, then go to MARENA in Managua. (V, 23, 4) (10.COMM) (10.GOV)

10.CONN = lack of connection of learning to “real life”

- Here in Diriamba I would say it's the same as in Carazo. People know and they take in things but they don't see it applying to their lives. Both the barriers—as far as their garbage, they know that it's dirty and it's gross and that it causes diseases. (VI, 3, 3) (10.CONN) (XX)
- Because it seems like every time I teach or give a talk or workshop or something, people know that if you cut down a lot of trees around the river, the river will dry up. But they don't apply it to them cutting down the trees, that they're part of the problem. They see themselves as removed. They don't see the connection. They know what the problems are, they know what the solutions are, they just don't see themselves as part of anything. (VI, 3, 3) (10.CONN) (XX)
- I think one of the really big keys to success in working here is mentality—kind of like in the U.S., you find a job—this is your job, you've been hired, you're going to do your job. You do the job first and you get to know the people second. Here it's totally different—to be effective here, you have to get to know the people. When I first went to the schools, they were like “Who are you again? What organization are you with?” They work so much better with people they have faith in, people they know, people they have trust in. It surprises them but they're really not that excited that you show up on time, that you show up when you tell them you'll show up—they really like to have that personal factor going. I think that's another important factor—I'd say start small and really get to know the people well. That's kind of the difficulties with the talleres [workshops]. It was so different the response I got from those who *knew* me and those who “knew of” me. I was in a class with 30 3rd grade teachers and a couple of 4th and 5th grade teachers. The ones I got to know in the class were the ones that really paid attention when I gave my talk. It was interesting—the ones I had kind of talked to, they seemed to take more of an interest in what I had to say—they were writing down notes and taking notes. I'd say that's a really big factor here. People like to have that one-on-one. (VI, 4, 11) (10.CONN) (10.ONE)
- Lack of environmental education. We would like to have a campaign in the community to help us with educating the students. When they return to their homes, they forget what they have learned in school. (II, 16, 2) (10.CONN) (XX)

10.COORD = lack of coordination between formal/non-formal sector and between government agencies

- I think that we need to start—the Minister of Education, we have barriers but I think they're not ... I'm afraid of expressing that we have a barrier because up to now, we haven't had a problem with this formal sector so how can I tell you that we had this or that barrier. They have this ability—if we talk about local NGOs who are trying to do EE, we have had problems with the MED because they have destroyed some projects in Matagalpa and they have also destroyed some materials that an NGO has designed because the MED didn't agree with the philosophy of the material. You might say that this is a big problem but if we go through national channels, if we work with them together, I think we'll have good results if we try to coordinate with them and not do efforts separately. They are very sensitive—they have their philosophy. We might not share their philosophy but, if you want to work with them, you need to coordinate with them. (I, 5, 7) (10.COORD) (XX)
- I don't think that the formal Ministry of Education will be the best avenue. I think we need a big umbrella that can set a commission that manages a project that will make all the institutions work and help the different institutions. As Don Silvio [Echaverry] said, to assume—we need that different institutions and civil society assume this responsibility for environmental education and the Ministry of Education in formal education by law has to assume but it's not enough. It's just a very slow way. The Ministry of Education needs the communication media to get together. It can't be just the Ministry of Education or MARENA—you need a bigger umbrella and integrated parts. (I, 6, 5) (10.COORD) (XX)
- Also we have the problem of jealousy. Everyone wants to take credit for the accomplishments but few want to work together. We need more cooperation between the ministries, teachers, and organizations. (II, 16, 2) (10.COORD) (XX)
- She said that both health education and EE are very interconnected because, obviously, if your environment is destroyed, your health starts to deteriorate also and there is a very important connection. She believes one of the biggest things that limit their ability to give environmental or public health education is systematic problems between the different institutions. Sometimes their activities are repeated or they're really similar and it seems they have divided the work for a lot of the programs. They're working for the same things but two different people are doing it. It's not mainly between the different ministries. A lot of these programs have limited visions—they only see one outcome from their education. She wants to focus, she believes there should be a focus on making your environment better

but remembering that there are people living in that environment also. This has to do with public management—a lot of uncoordinated activities. There's a lot of commissions but there's no system and she believes that the focus should be more on the leaders of the communities such as the mayors. They should take this as one of their responsibilities and not just leave it up to MED or MINSA or MARENA. There needs to be a coordination between the different institutions and sectors. In Carazo, there have been some advances and this has mainly been through commission meetings—getting together and talking about these problems but in practice there's very little being done. A lot of activities are sporadic—there's not a lot of carry through, nothing is really strongly developed as far as in the education. (II, 22, 2) (10.COORD) (XX)

- There's a lot of commissions but there's no system and she believes that the focus should be more on the leaders of the communities such as the mayors. They should take this as one of their responsibilities and not just leave it up to MED or MINSA or MARENA. There needs to be a coordination between the different institutions and sectors. In Carazo, there have been some advances and this has mainly been through commission meetings—getting together and talking about these problems but in practice there's very little being done. A lot of activities are sporadic—there's not a lot of carry through, nothing is really strongly developed as far as in the education. (II, 22, 2) (10.COORD) (2.CMS)

10.GOV = bureaucracy and lack of governmental support

- She says that the first problem she sees is the bureaucracy between the institutions, the red tape. If you want to talk to a student, you have to go to the principal, then you have to go on up and you have to get one thing signed at one institution and another at others and so on. She also says another problem is the materials—there aren't a lot of material resources. (V, 18, 2) (10.GOV) (10.VERT)
- She said [MED has] supported the idea, they haven't supported the guidebook. At first they had problems with the central MED here in Managua. She believes that they were a little but jealous because they were developing the guidebook. They started working in the Masaya area and the local offices of MED were giving them a lot of support and they were talking to the central offices and telling them that this was a really good guide book and that they really liked it. So, she is hoping now that the central office will like it and that they'll get more support. (IV, 20, 2) (10.GOV) (14.MED)

- She said that she sees the biggest barrier as being there is no government support with the things the NGOs are doing—NGOs are doing a lot but you don't see a lot of evidence because there's not support from the government. They did pass the law that they had to have the 60 hours of environmental work to get their degree—from high school. She says that's good but a lot of people are doing it to get their degree and they're not having the environmental conscience but that that comes with time and support from the government. (IV, 20, 3) (10.GOV) (XX)
- Also, they don't have any help from the central government. They're missing human and material resources and it's hard to complete the projects they have in mind without the monetary resources. They need to have a specific fund dedicated to environmental problems and environmental education. (III, 21, 2) (10.GOV) (10.RES; 10.\$)
- She also believes another thing that limits them is instable politics of the state institutions and the ministries and financial problems. They don't have enough money to pay for pamphlets, videos, and, depending on the community, different ways to spread their messages. (II, 22, 2) (10.GOV) (10.\$; 10.RES)
- [Jinotepe's environmental] commission really hasn't done anything. It's mainly because the mayor has everything centralized so everything has to go for him and he was away for awhile in Spain, and he doesn't know exactly what he was doing there. (V, 23, 3) (10.GOV) (2.CMS)
- And [I believe] that if you go to MARENA you're wasting your time that they just write these things and send them out but they never come out here. It's very centralized and it only does work pretty much in Managua. And . . . if you want to go and be lied to and be won over, then go to MARENA in Managua. (V, 23, 4) (10.GOV) (10.COMM)
- [Diriamba's environmental commission] has [me] a little bit concerned because it's only working in the rural areas, there's not anything going on within the town and a lot of the problem is that it has a political interest. The only people involved are from the liberal party and that it's not really a city interest—though the mayor of Diriamba does seem to have some interest in the environment. (V, 23, 9) (10.GOV) (2.CMS)
- In Jinotepe, it's also party oriented and there are some people that are included and there are some people that aren't and that depends on the politics. The Jinotepe mayor doesn't have very good relations with MARENA so they aren't involved in their environmental commission. Some groups are working independently in Jinotepe—they haven't been

invited to the commission or wanted to participate but they're still doing work in environmental education. (V, 23, 10) (10.GOV) (2.CMS)

- He mentioned the political problems mainly to give you an idea that this has been hurting the environmental education—that you should be able to take out the political ideology but, unfortunately, a lot of these commissions have problems with this. (V, 23, 10) (10.GOV) (2.CMS)

10.INT = lack of interest

- [Interviewer] So that might be another thing that could increase EE, more time in school. [Subject] Possibly, but the teachers can't teach what they don't know anything about or don't have initiative to learn about or plan for. More school time doesn't seem realistic at this point. (VI, 12, 7) (10.INT) (10.KNOW; 10.TIME)
- She also said the third point is that there doesn't seem to be a lot of interest in the general population for environmental programs or EE—they don't seem to perceive that there are any problems yet as far as environmental problems. (V, 18, 2) (10.INT) (XX)
- A lot of people would say that it's the economic situation—that's one of the problems. But [I don't] believe that—[I believe] it's more the interest to work and the voluntdue of the people. [I've] done a lot of inviting people who should be in charge of these kind of programs to different meetings and activities and they don't seem to want to come. And *then* for [me] would come the economics. But [I] would say that's after the lack of interest. It's more the people that are in charge of these different things that don't have the interest, but should be leading. They're the ones that can do a lot and they're supposedly the ones that should have interest. (V, 23, 11) (10.INT) (1.ECON)

10.KNOW = lack of knowledge

- [Interviewer] We did a similar study to this in Wisconsin and examples of barriers were lack of resources, lack of time, lack of training, problems like that... [Subject] The barriers here are similar. (I, 5, 7) (10.KNOW) (10.TIME; 10.TNG; 10.RES)
- [Interviewer] So that might be another thing that could increase EE, more time in school. [Subject] Possibly, but the teachers can't teach what they don't know anything about or don't have initiative to learn about or plan for. More school time doesn't seem realistic at this point. (VI, 12, 7) (10.KNOW) (10.INT)

- The biggest problem is that people don't know what environmental education is. When they hear that's what it is, they just think about picking up trash and planting trees. (V, 23, 5) (10.KNOW) (6.KNOW)

10.ONE = one-shot efforts on the part of organizations or trainers

- But what they do is they sweep in, maybe an organization comes in and they're like, "Okay, we're going to focus on this, this year." And they give a talk and the teachers all learn about it and then they go away and it goes back to the way it was. And that's like a campaign, it's the same thing. And that's how everything in Nicaragua has been, as far as I can see—as far as development work or things to help out in the community. It's like there's this problem, everybody comes in, they have this big thing, they talk about it, and everyone leaves. Or it's once a year they talk about it, like violence in the home, they had this big violence in the home thing. And I'm not saying it's not good but the fact that it's not constant, always there, people don't see it as always being their responsibility, their problem, or something that needs to be taken care of. (VI, 3, 7) (10.ONE) (XX)
- I may be being negative because I know a lot of people have had projects and a lot of projects have been nice but to be effective, they've got to be sustainable. And I don't feel that I've been that effective either because it hasn't been set up where it can be sustainable. It's been set up where I do the work and then I leave even though I've been trying to find somebody to take over, there's nobody put in that position to take over. (VI, 3, 8) (10.ONE) (XX)
- I think one of the really big keys to success in working here is mentality—kind of like in the U.S., you find a job—this is your job, you've been hired, you're going to do your job. You do the job first and you get to know the people second. Here it's totally different—to be effective here, you have to get to know the people. When I first went to the schools, they were like "Who are you again? What organization are you with?" They work so much better with people they have faith in, people they know, people they have trust in. It surprises them but they're really not that excited that you show up on time, that you show up when you tell them you'll show up—they really like to have that personal factor going. I think that's another important factor—I'd say start small and really get to know the people well. That's kind of the difficulties with the tallers [workshops]. It was so different the response I got from those who *knew* me and those who "knew of" me. I was in a class with 30 3rd grade teachers and a couple of 4th and 5th grade teachers. The ones I got to know in

the class were the ones that really paid attention when I gave my talk. It was interesting—the ones I had kind of talked to, they seemed to take more of an interest in what I had to say—they were writing down notes and taking notes. I'd say that's a really big factor here. People like to have that one on one. (VI, 4, 11) (10.ONE) (10.CONN)

10.PRI = not a priority at a national level

- The least assistance [Diriamba's ecological brigade] gets is from the Ministry of Education because environmental education is not a priority to [MED]. (VII, 10, 3)
- [With] the Minister of the Environment, MARENA, it looks like every year the budget is getting smaller and [they] get less money and less resources to work with and this is the reality... (VII, 10, 4) (10.PRI) (5.MARENA)
- Before there used to be an ecological brigade direction at the central level in MARENA and they even had a building where they had kinds of activities. But since they closed the department, the ecological brigades are run by themselves so the kind of activities they get involved in—it depends on the kind of local leader they have. (VII, 10, 4) (10.PRI) (XX)

10.RES = lack of resources

- The ones that really want to do [in-service training courses] are interested, but they just don't have the activities and the resources and stuff like that. (VI, 4, 7) (10.RES) (9.INS)
- We did a similar study to this in Wisconsin and examples of barriers were lack of resources, lack of time, lack of training, problems like that... V: The barriers here are similar. (VB?) (10.RES) (10.TIME; 10.TNG; 10.KNOW)
- Usually there are no resources—no libraries so it is difficult for the teachers and that's why we are using very basic activities for which they don't need a lot of background information. But there are some areas—in Chontales, this department where a Dutch NGO developed a guide with the Peace Corps volunteer that has all the background information about the local natural resources and they have trained a lot of teachers in the department to use the manual but that is not common in the different regions. There are some departments with the big cities, like Leon, where they have more than one big library but, in general, teachers don't have resources to gather information for use. (VI, 13, 10) (10.RES) (XX)
- Lack of environmental education resources. Almost all of the ministries and organizations at the municipal and departmental levels need a bigger budget in order to achieve all of their goals. (II, 16, 2) (10.RES) (10.\$)

- She also says another problem is the materials—there aren't a lot of material resources. There's not a place of documentation where the students can go to get adequate information for any research or projects they might want to do on environmental education. (V, 18, 2) (10.RES) (XX)
- She said there's not many places to go to get any information you might need. She thinks there should be a place, at least in the Mayor's office, an area on the environment—a place where people can go with questions and a place where they would collect all the information—where the information is for all those people. She said that Don Silvio [Echaverry] is probably the only human resource she can think of where people can go ask questions and find out about what's going on or get information on the environment. So far she hasn't seen a lot of interest within the people to get the information or to have it for others. She doesn't know of a place that would have posters or that kind of written information. (V, 18, 2) (10. RES) (XX)
- She wanted to properly answer number five about the way it was written—about FUNCOD. They don't have any information here in Carazo. They do get information once in awhile when there's a campaign—when they're doing a national project. Managua centralizes all the information there and they don't like to give it out or have it in the departments so if you want to find out about information that FUNCOD has, she would have to go into Managua to get it. She said as far as human resources, she was the human resource and they have five other people that once in awhile help out with other things but for the department, she doesn't have anything. (V, 18, 2) (10. RES) (XX)
- Also, they don't have any help from the central government. They're missing human and material resources and it's hard to complete the projects they have in mind without the monetary resources. They need to have a specific fund dedicated to environmental problems and environmental education. (III, 21, 2) (10.RES) (10.GOV; 10.\$)
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10.RESP = putting responsibility for environmental problems on others

- So, it's like making that connection between what's going on and their personal responsibility for it. And they seem to put the blame on everybody else. It's the big

companies that are doing it, the foreigners that are doing it. It's Joe down the street that's selling firewood, it's MARENA that's doing it. There's not any personal responsibility—or personal responsibility for their surroundings and their environment. I'd say that's the biggest thing. (VI, 3, 3) (10.RESP) (XX)

10.TIME = lack of time

- The barriers I first noticed when I got here were the teachers—I mean the teachers don't make much here. They really don't make enough money to support a family and a lot of them have second jobs which means they're leaving the school right after school and going to a second job. (VI, 4, 5) (10.TIME) (10.\$)
- Other restrictions are temporal. It's kind of crazy to say but, they just have a different idea totally of time down here. They waste so much time! Activities never start on time, and people don't utilize the time they have. The schools only run half a day and I can't get my ecological brigade to do anything other than during school time. It blows my mind that they have a half day of vacation every day, but the director told me that we can't schedule ecological brigade activities, because basically he doesn't think anybody would show up for them. So, the students are in the streets after school or in the morning because their class schedules run in the afternoon. I first thought "Well, this is great—we can at least have all these activities," then I realized that they weren't too worried about the kids missing out on whatever curriculum they're pulling them out of. (VI, 4, 6) (10.TIME) (XX)
- They feel EE is important, but they just can't decide where to stick it in the education program, and that's a big problem right there. We've been using Orientacion Laborale of the 3rd grade for quite awhile now in Arlen Siu because usually the kids just end up drawing things, so we've been turning it into an EE program. In the higher grades, nobody knows where to stick it. They're getting into the harder core science and they don't seem to really have room in the curriculum—they don't have really any good, solid programs. (VI, 4, 6) (10.TIME) (6.TIME)
- [Interviewer] We did a similar study to this in Wisconsin and examples of barriers were lack of resources, lack of time, lack of training, problems like that . . . [Subject] The barriers here are similar. (I, 5, 7) (10.TIME) (10.RES; 10.TNG; 10.KNOW)
- [Interviewer] So that might be another thing that could increase EE, more time in school. [Subject] Possibly, but the teachers can't teach what they don't know anything about or

don't have initiative to learn about or plan for. More school time doesn't seem realistic at this point. (VI, 12, 7) (10.TIME) (10.KNOW; 10.INT)

10.SENS = lack of environmental sensitivity

- Lack of consciousness in our population. [greatest barriers to environmental education in Diriamba] (III, 9, 1) (10.SENS) (XX)

10.TNG = the teaching style in which educators are trained at the normal school (not very active, very traditional)

- I think a big problem in education is ineffective teaching methods (including "by example"—it's frustrating when the teachers throw trash in the street after school clean-ups). A teacher I worked with in La Paz was copying lengthy paragraphs out of the book and said "Okay kids, let's copy this." It just didn't have any effect on the kids. Instead, he could give charlas [talks], taking the trash, burying it, and digging it up two months later. They don't think about it. (VI, 4, 5) (10.TNG) (6.TNG)
- [Interviewer] We did a similar study to this in Wisconsin and examples of barriers were lack of resources, lack of time, lack of training, problems like that . . . [Subject] The barriers here are similar. (I, 5, 7) (10.TNG) (10.TIME; 10.RES; 10.KNOW)
- From the year 1983 [MED] started incorporating environmental education in the curriculum from the Ministry of Education and even people from FUNCOD like (?) Carmin Olatta was working with them but one of the weaknesses that was striking in those days was, like right now, that there was not a proper training for the teachers so that they could implement the . . . whatever they have incorporated in the environmental education program and she still feels like there's a need to do that. And from the year 1988 up to now it looks like people are becoming more aware of the need and it looks like some efforts are being done on that subject. But again she feels, and she emphasizes the fact that more training should be done in order to capacitate the teachers so that they can pass on the knowledge they acquire to the students. (I, 11, 3) (10.TNG) (XX)
- I think the way that people teach here—I know that there is a school called the "Normale" where all the teachers go and then they do a one or two year internship in different parts of Nicaragua. However, the training doesn't seem to help because many teachers just talk *at* the kids and the students don't pay attention. There's not enough hands on activities or labs. I don't think you need a lot of resources to think of a lab or experiment. You may need a

few materials but it's not very expensive and you can find things within the community to do activities. I don't think money is the big problem—I think it's just ideas and the way their teaching is here. Some teachers are great, however it seems that the majority of teachers use traditional teaching methods, and the kids don't learn to think for themselves or learn to solve problems or even analyze what the problem is. (VI, 12, 4) (10.TNG) (XX)

10.VERT = vertical chain-of-command structure—orders must come from the top

- First of all, in the national level of the department because [MED has] a very vertical management system so the teachers won't take a step if they don't have the agreement of their chief. (I, 5, 7) (10.VERT) (XX)
- We worked hard last year with the Ministry of Education and right now we are—education and MARENA are working on an assignment, through a grant, and in order to push the environmental education at the Ministry of Education. And we have a lot of frustration but the vice minister is very, very interested in this subject of environmental education (I, 6, 5) (10.VERT) (14.MED)
- She says that the first problem she sees is the bureaucracy between the institutions, the red tape. If you want to talk to a student, you have to go to the principal, then you have to go on up and you have to get one thing signed at one institution and another at others and so on. She also says another problem is the materials—there aren't a lot of material resources. (V, 18, 2) (10.VERT) (10.GOV)

11. Factors that would best help to improve level of environmental education in formal setting

11.\$ = more funding

11.COORD = coordination between different government departments (MARENA, MED, MINSA, etc.)

- Above her [WHO?] is Martilisia DeNovio who is the director of the high school, with whom the vice-minister is working on this compendium in order to relate the communities of the POSAF project and the TROPISSEC project, to make a relation between these environmental education and other projects which are spread in a lot of municipalities, a lot of very

important municipalities, but it will take time because we need to prepare the conference and that takes time. (I, 6, 6) (11.EE) (14.MED; 14.CEC; 14.POSAF)

11.EE = person specifically focused on EE

11.NET = more networking between schools and programs

- More getting together and networking between teachers. Get rural schools together with Jinotepe schools—like Guisquiliapea—urban teachers together with rural teachers to share ideas. (VI, 12, 6) (11.NET) (8.TEACH)
- She would like to say that it would be nice to have someone here to orient them to EE so that they're not just wandering around blindly, experimenting with ways to educate about the environment. There's a lot of people that would probably like to work within this area but there hasn't been given a lot of priority to it or a place where they can exchange ideas or questions—a place where they could get together and work on what is EE. She hopes that maybe you could support them in that—with the orientation and with this project—to get an objective so that they're not just wandering around. (V, 18, 2 & 3) (11.NET) (11.TNG)

11.PLAN = planning/coordination

- It's not taking advantage if they don't have the, they could have at the beginning of each school year, or before that, the responsible teachers for the environmental project sitting down with say the environmental commission and planning out what each school was going to do and how different organizations were going to aid them in that project. (VI, 3, 4) (11.PLAN) (XX)
- And I think it would be a lot easier on the teachers, because they say they don't have the time, if they would have like a year-long project to work with their last year students that have to complete their 60 hours, and have it well planned out so that the kids could do a lot of it on their own, the teacher doesn't have to be there with a group of 60 kids picking up trash but could have each kid working on their compost project as a small group or gathering information, because it's for the kids to learn and to help the community too. (VI, 3, 4) (11.PLAN) (XX)
- And one teacher is responsible for thinking up what they're going to do. Whereas, I think it would be neat if, at the beginning of the year, all of the teachers could come together, they could brainstorm on the problems, they could brainstorm on possible activities, organizations

could give them ideas, they could take these ideas back to their last year students and have the students decide what they want to do for their 60 hours, whether they want to break up in four groups in their high school and work on four different projects where the teacher could dedicate one Saturday a month to work with one group and then they do the rest on their own and she can just supervise. Something like that where they're actually doing a project that counts for something and the kids have an input in what's going on and they're learning from it. (VI, 3, 4) (11.PLAN) (XX)

11.TIME = more planning time

- Are the teachers given planning time during the day generally or not? JB: It's kind of hard to say—the schedules that most of the teachers have allow an extra hour maybe a week but they have little bits of time that they usually use in talking to students or grading papers so most of their planning is done outside of school which is why they don't really deviate from what the book says. (VI, 4, 9) (11.TIME) (XX)
- Of course the majority of the teachers do not have time to work after school. (II, 16, 2) (11.TIME) (XX)

11.TNG = pre-service and in-service teacher training, community leader training

- I think there's going to be a lot done with teacher training for formal education of students. They do have, I believe, like two weeks before every school year which is donated to teacher in-service training. (VI, 3, 3) (11.TNG) (XX)
- And those two weeks could really be taken advantage of by using them to give maybe a two-day workshop on how to incorporate environmental topics in the different classroom issues and how to use their guidebook that they do have by MED and the environmental issues they're supposed to cover (VI, 3, 4) (11.TNG) (XX)
- So, I think the materials are there, I think that they need to use that time to dedicate for all over the country, especially here in Carazo, for a certain amount of time where they teach the teachers how to do that. And they do have the time and I believe that they do have the resources, it's just getting those together. (VI, 3, 4) (11.TNG) (XX)
- So, I think if you had good teacher training and also you can manage with what is there, and work with that first, maybe you can go on to include more things, include more education. (VI, 3, 5) (11.TNG) (XX)

- But I believe it's like a thing that has to keep going every year and has to be integrated and if every teacher training had two days dedicated to environmental education—how you can work it into your schedule, every semester if the teachers had that, they would always have it there. (VI, 3, 7) (11.TNG) (XX)
- I'll tell you what the teachers really like. They really like the teacher in-service trainings where an outside organization gives them and pays for it. They got into a big fight with MED because when they had the one in July, they said they were supposed to get more money to cover transportation and food... (VI, 4, 7) (11.TNG) (9.INS; 2.TTNG)
- I think there should also be more workshops—kind of like in-service training—have workshops teaching teachers new games all the time—just new projects and more getting together and networking between teachers. (VI, 12, 6) (11.TNG) (8.TEACH; 9.WRK)
- I think, in the Escuela Normale, they should incorporate teaching about the environment. I think they're doing that right now—they're teaching teachers how to raise viveros [tree nurseries], how to do composting—but I don't know if they're teaching about how to think about how animals adapt or how to make up experiments or do investigations of any kind. But it would be a good idea to teach how to encourage students to think for themselves. I think labs should be required in primary and secondary schools and a science fair could be implemented into the program. (VI, 12, 5) (11.PRE) (2.TTNG; 8.TEACH)
- She would like to say that it would be nice to have someone here to orient them to EE so that they're not just wandering around blindly, experimenting with ways to educate about the environment. There's a lot of people that would probably like to work within this area but there hasn't been given a lot of priority to it or a place where they can exchange ideas or questions—a place where they could get together and work on what is EE. She hopes that maybe you could support them in that—with the orientation and with this project—to get an objective so that they're not just wandering around. (V, 18, 2 & 3) (11.TNG) (11.NWK)
- In this proposal, we set out a diagnosis of the problems in this area in order to develop the government for the children because we were working to the families too in order that they will see these environmental problems and relate to them. Now we don't have any experience with that. We have the basics to develop a new and effective material. That's if the permit is given to us. Also I think we need to have some training. (VIII, 19, 2) (11.TNG) (XX)
- No, I [don't think we have any printed materials available]. We don't have these kind of resources. The idea also to apply for this as a project, to develop some kind of materials. I

think we need training in this area—for example, how to make pamphlets. We don't have this kind of experience. So, I think what we can do with these projects is to get some training on how to pass from technical papers to something more useful. (VIII, 19, 3) (11.TNG) (XX)

- [The Jinotepe mayor's office has] developed educational talks within the schools and they've had lots of acceptance by the students and the teachers. They've also developed talks with other sectors that have demonstrated interest and support in environmental actions. (III, 21, 2) (11.TNG) (XX)

11.YOU = including youth and students in more environmental projects

- He said that one of the factors that needs to be exploited the most is the student and young people population. Their numbers are the highest and with EE they can work to maintain the environment as it is and also work in these projects to better the town. (III, 17, 3) (11.YOU) (XX)
- From this participation [in a practicum in the field] of the students, now we have a proposal for a project where the students will go another five weeks—but this is extra pay—they will train the students to make an evaluation of the forestry system that they have and do an evaluation of the area's agriculture and after they will prepare a report. It is possible to have some help from the people. They like to work with the university and of course it is the cheapest labor. To me, it is possible for the students to do something and present something. (VIII, 19, 3) (11.YOU) (2.TEC; 2.UNIV)
- He says that he's been trying to explain to them that environmental education is not just picking up garbage or planting a tree—it's working in your neighborhood and community or, he thinks it would be a good idea if secondary students would go into the primary schools and give little talks with the kids and doing activities with them . . . (V, 23, 4) (11.YOU) (XX)

12. Non-formal Avenues

12.4S = Nicaraguan 4H

- [The boy/girl scouts] do some community service and work but it depends on different communities—they do environmental projects more like campaigns like collecting garbage or something like that. There are two different groups—one is the ecological brigades that

were organized through the mayor's office at the beginning then MARENA took them over. Then there are the 4H groups—started through the Nicaragua Institute for Agricultural Extension. This is something taken from the United States—4H but here it is called 4S. They are planning to focus on training youth groups to work on agricultural projects. So, Ecological Brigades and 4S are the ones I know. (VI, 13, 5) (12.4S) (2.CAM; 2.TRAS; 14.MARENA; 12.SCO)

12.BRIG = community ecological brigade

12.CH = church groups

- There's a lot of church groups (VI, 3, 5) (12.CH) (XX)
- Which non-formal avenues do you think are or would be the best to introduce EE into the community itself? JB: The first is religion. Almost everybody is really religious here—most of them are really Catholic. We're not really sure as to how that will work, but we were thinking that if we can get the religious sectors in with this program that we'll have people who are interested in doing it because they are people who go to church, not that people who *don't* go to church *don't*, but people that go to church generally express a higher level of consciousness about things in the environment and about wanting to help their community. (VI, 4, 10) (12.CH) (XX)

12.NG = neighborhood groups

- There's a lot of ... a lot of community groups—really informal groups—like women getting together groups, where people have interest in certain environmental problems, it's usually related with health issues. A lot of people see that things around their neighborhood aren't as good as they'd like them to be. (VI, 3, 5) (12.NG) (XX)
- There's a sector that sometimes is over-looked, it's the ordinary housewife. They don't have any way to know about it—about how to get conscious, in education, so they have not enriched ... To give you an example, you walk into a house and the housewife is sitting down and so is a fly and the fly sits on the table, she goes and get the aerosol and sprays it. There's a sector that has not been reached by any means. (I, 6, 6) (12.NG) (12.WOM)
- There is a group of people who work with the Health Center to teach people how to prevent malaria and other diseases. This is a possible avenue seeing as how health and the environment are so interconnected. (VI, 12, 7) (12.NG) (XX)

12.SCO = boy and girl scouts

- One very important thing is happening that many organizations like the scouts and some other organizations are beginning to get in touch with the Ministry of Education and showing their interest in environmental education. Right now, [I'm] at the stage of organizing all these things and [I expect] that in about a month [I will have a structure better defined once all the teachers go back to the academic year, because right now you know they're on vacation. But right now, [I'm] in the stage of organizing these things and [there's an] interest of all these associations and organizations to become involved with environmental education. (I, 11, 2) (12.SCO) (14.MED)
- [The boy/girl scouts] do some community service and work but it depends on different communities—they do environmental projects more like campaigns like collecting garbage or something like that. There are two different groups—one is the ecological brigades that were organized through the mayor's office at the beginning then MARENA took them over. Then there are the 4H groups—started through the Nicaragua Institute for Agricultural Extension. This is something taken from the United States—4H but here it is called 4S. They are planning to focus on training youth groups to work on agricultural projects. So, Ecological Brigades and 4S are the ones I know. (VI, 13, 5) (12.SCO) (2.CAM; 2.TRAS; 14.MARENA; 12.4S)

12.WOM = women's groups

- There's a lot of ... really informal groups—like women getting together groups, where people have interest in certain environmental problems, it's usually related with health issues. (VI, 3, 5)
- There's a sector that sometimes is overlooked, it's the ordinary housewife. They don't have any way to know about it—about how to get conscious, in education, so they have not enriched ... To give you an example, you walk into a house and the housewife is sitting down and so is a fly and the fly sits on the table, she goes and get the aerosol and sprays it. There's a sector that has not been reached by any means. (I, 6, 6) (12.WOM) (12.NG)

13. Increasing EE non-formally

13.EE = person specifically focused on EE within community

- I mean, I think they'd have better results if there was somebody who was just paid to do that job and they were well-trained or even the organizations had somebody just in that. (VI, 3, 6) (13.EE) (XX)

13.FOR = public forum

- I also think that if the mayor's office was to hold a forum and invite the public, it would work well. People are really into meetings and they like to talk about their problems. So I think if they were to put up notices that we were going to have a ... (VI, 3, 5) (13.FOR) (XX)
- You see Maria in the neighborhood of, you know, Santiago has a complaint and they have a bad water running system through their streets and her kids are getting sick, and she can see that it's an environmental problem. Maybe she's not really into the environment on other levels but she's interested in that and she doesn't know where to go with this problem or to say anything about it so if they had an open forum that the public knew about where they could try to find ways to solve or educate the people, and it was open to the public, I think that that could be a good avenue. Or like free talks or free workshops... (VI, 3, 5) (13.FOR) (XX)

13.ORG = method of organizing concerned citizens

13.TNG = training

13.WK = community workshops

- Or like free talks or free workshops... (VI, 3, 5) (13.WK) (XX)
- Yeah, like we have the community house, the cultural house or center, and they have community workshops all the time for other things. (VI, 3, 5) (13.WK) (XX)
- It would be nice if you could like say we're talking about the garbage problem in Diriamba at 7:00 on Saturday, you know, put a poster there announcing it and then anybody who wanted to come talk and try to find solutions about it could come—instead of always inviting the head of MARENA and the head of the schools because you're getting people who are supposed to be interested in it but most of the time they're not. (VI, 3, 5) (13.WK) (XX)

- And the people are interested, they just don't know how to organize or what to do once they are organized. I think it would be nice if these organizations helped them out, helped to organize them with a common problem. I don't know, either go in, to them neighborhood by neighborhood and the meetings and have the people discuss their environmental problem is for that neighborhood. (VI, 3, 5) (13.WK) (XX)
- But right now they see themselves as figuring out the problem, figuring out the solution, making the project and finding the resources, and that's just, like some people have come to the commission meetings with projects and they have this letters that says, "We would like to do this project. It will cost this." (VI, 3, 5) (13.WK) (XX)
- They don't know how to write a budget, they don't know how to write a proposal, they don't know how to do anything—and the people on the commission just look at it and set aside because That's a nice project. It's a problem of organizing—organizing and finding the resources for the problems that are out there. (VI, 3, 5) (13.WK) (XX)

14. Collaborating Institutions and Groups (Currently collaborating or possible partners)

14.ALC = Alcadia (Mayor's office)

- As it turned out, the mayor's office was to take over a German project that was made for tree nurseries in town. The Germans were running it for one year and the mayor's office was supposed to be running it for the next year. (VI, 3, 1) (14.ALC) (XX)
- The Centro de Salud [health center] works with the school's health brigade, and we formed an Ecological Brigade at the school so a lot of it is just the coordination of the activities between the groups represented on commission: the Alcadia [mayor's office], Centro de Salud [health center], [municipal] police, and the brigades. (VI, 4, 3) (14.ALC) (2.BRIG; 14.MINSA)
- The way it stands right now on the itinerary, the Ecological Brigades are going door-to-door and explaining how to separate organic and inorganic trash and explaining that trash recollection is every Friday and that people have to pay \$6 a month for it. If they don't want to pay for it, they have to take it out to the site to dump it. We're going to get this program going, and the Alcadia [mayor's office] is hoping the people will be really interested and will start responding to this. (VI, 4, 4) (14.ALC) (2.COMP; 2.TRAS; 8.COMM; 8.12)

14.CEC = CECOTROPIC

- Two other people are working with us [to put together the commission]—one person from UNA and one representative from CECOTROPIC, which is another NGO. He's the secretary of the commission, he's a newspaper man, he's the one who is doing the publicity and extends the invitations, since he has access to the media and communication—Humberto Campos. (II, 1, 11) (14.CEC) (XX)
- Above her [WHO?] is Martilisia DeNovio who is the director of the high school, with whom the vice-minister is working on this compendium in order to relate the communities of the POSAF project and the TROPISSEC project, to make a relation between these environmental education and other projects which are spread in a lot of municipalities, a lot of very important municipalities, but it will take time because we need to prepare the conference and that takes time. (I, 6, 6) (14.CEC) (11.COORD; 14.MED; 14.POSAF)
- [The Jinotepe mayor's office has] also been getting help from CECOTROPIC. They help the small producers with financing for planting basic crops and for reforestation. (III, 21, 2) (14.CEC) (2.TEC; 2.REF; 5.CEC)
- He said that he can give you a sheet on what CECOTROPIC does. They're involved in a lot of things. He said that CECOTROPIC is a national NGO with lucrative funds and it stands for the "Center for Ecological Development Studies of the Tropics" and they're a part of the Action Forestry Plan. He can give you a pamphlet with more information. (V, 23, 7) (14.CEC) (XX)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (14.CEC) (2.CMS; 14.MAR; 14.FUN; 14.POS; 5.GER)

14.COMARENA = COMARENA (Santa Teresa's Commission of Natural Resources)

- This is the environmental commission, it's called COMARENA, of natural resources. It's based in Sta. Teresa in Carazo. This is their document for environmental education and this

is their plan for Sta. Teresa—it's been formed for awhile. This is Sta. Teresa—Sta. Teresa is Chacocente's area and this is their plan, which is specifically for the turtles. This Thursday, supposedly, the commission will be getting together to re-do their document, this is an old document but he hasn't been that into what they've been doing lately. (V, 23, 3)
(14.COMARENA) (2.INST)

14.FTF = farmer-to-farmer

- Through POSAF we are requesting to Farmer-to-Farmer project, we're requesting to have an agroforestry specialist come there. (II, 1, 11) (14.FTF) (XX)
- There are some organizations, like the one we just mentioned, Farmer to Farmer where some more information, some other educational material could be obtained and [I would] be more that happy to get in touch with these other organizations, whatever is possible, in order to be able to obtain that kind of material and also to get a better coordination at national level because a lot of efforts are duplicated because a lot of organizations are working by themselves and probably if we coordinated actions a more efficient type of work will be done. (I, 11, 4) (14.FTF) (6.COMM)

14.FUN = FUNCOD

- Some of these NGOs like FUNCOD and MAN are trying to get information out to these rural people. (II, 1, 5) (14.FUN) (XX)
- We have a girl from FUNCOD—we allow her to have offices with us there at MARENA. They are helping us a lot and you can see there is a lot of interest from many people. (II, 1, 9) (14.FUN) (XX)
- Other environmental non-government organizations like FUNCOD and MAN have also contacted [MED] besides the scouts and the Peace Corps. (I, 11, 2) (14.FUN) (14.MAN; 14.PC)
- Some agreements have been agreed on between MARENA and MED but they seem to be being revised. They haven't been put out the public yet but [I'm] expecting that pretty soon the sphere of this agreement will be known to the public so that they can make good use of it. Most of the supporting institutions and organizations that have cooperated with MED have been MARENA and FUNCOD. (I, 11, 4) (14.FUN) (14.MARENA; 14.MED)
- Their main work is to support programs in environmental education (EE), deforestation, watershed projects—any kind of project that's going on in Carazo they support with their

people or in whatever way they can support it. They do formulate some small projects in the area. She's been working mainly with MARENA and me as far as EE and they've been focusing mainly on the schools. (V, 18, 1) (14.FUNCOD) (5.FUNCOD; 2.K12; 14.MAR)

- They are in a national coordination of NGOs where each NGO has their job—some work in only reforestation—others work in only certain areas . . . FUNCOD is in EE but they work in the informal sector. They work with the National University of Engineering with the measurement of how many gases are in the air. (IV, 20, 4) (14.FUN) (2.STU)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (14.FUN) (2.CMS; 14.MAR; 14.CEC; 14.POS; 5.GER)

IUCN = International Union for the Conservation of Nature (UICN in Spanish)

- She said that [MAN works] just nationally but they have a brotherhood through UICN.

14.MAG = Ministry of Agriculture

14.MAN = MAN

- Some of these NGOs like FUNCOD and MAN are trying to get information out to these rural people. (II, 1, 5) (14.MAN) (XX)
- Other environmental non-government organizations like FUNCOD and MAN and noted that they have also contacted [MED] besides the scouts and the Peace Corps. (I, 11, 2) (14.MAN) (14.FUN; 14.PC)
- She says that [MAN thinks] that the EE is the most important because that's where you start but that they're also working in a lot of legal actions. They have passed environmental laws in the past year and they were part of the process of getting those passed and that's what they've been working on in the last year. (IV, 20, 1) (14.MAN) (XX)

- They are in a national coordination of NGOs where each NGO has their job—some work in only reforestation—others work in only certain areas. MAN works in legislation and EE and so they wouldn't be working in reforestation. (IV, 20, 4) (14.MAN) (XX)

14.MARENA = MARENA

- MARENA is the one that is promoting the organization of these commissions. In November, we had a conference at the national level (Nov. 11 - 13) on EE. (II, 1, 4) (14.MARENA) (XX)
- The state commission is sort of coordinated by MARENA, but not only MARENA. (II, 1, 10) (14.MARENA) (XX)
- So, I moved on to working with MARENA and, with them, I started trying to work with some of the Brigade groups in the schools. (VI, 3, 2) (14.MARENA) (XX)
- GreenCOM/Nicaragua is establishing the capacity to continue this work with the MARENA Division of Protected Areas. This includes on-the-job training of local counterparts and purchase of equipment and materials. All our materials are designed by people working in protected areas, directed to a specific audience within a specific local context. (VI, 2, 4) (14.MARENA) (XX)
- I know of few or no programs that are working in this respect. The Commission of the Environment and Natural Resources, COMARENA. (III, 9, 1) (14.MARENA) (2.CMS)
- Opportunities offered by the state institution [MARENA] and international organizations concerned for the environment. (III, 9, 1) (14.MARENA) (XX)
- Some agreements have been agreed on between MARENA and MED but they seem to be being revised. They haven't been put out the public yet but [I'm] expecting that pretty soon the sphere of this agreement will be known to the public so that they can make good use of it. Most of the supporting institutions and organizations that have cooperated with MED have been MARENA and FUNCOD. (I, 11, 4) (14.MARENA) (14.MED; 14.FUN)
- [The boy/girl scouts] do some community service and work but it depends on different communities—they do environmental projects more like campaigns like collecting garbage or something like that. There are two different groups—one is the ecological brigades that were organized through the mayor's office at the beginning then MARENA took them over. Then there are the 4H groups—started through the Nicaragua Institute for Agricultural Extension. This is something taken from the United States—4H but here it is called 4S. They are planning to focus on training youth groups to work on agricultural projects. So,

Ecological Brigades and 4S are the ones I know (VI, 13, 5) (14.MARENA) (2.CAM; 2.TRAS; 12.SCO; 12.4S)

- MED works with . . . MARENA on the ecological brigades and their reforestation and clean-up plans. (II, 16, 1) (14.MARENA) (14.MED, 2.REF, 2.TRAS)
- Their main work is to support programs in environmental education (EE), deforestation, watershed projects—any kind of project that’s going on in Carazo they support with their people or in whatever way they can support it. They do formulate some small projects in the area. She’s been working mainly with MARENA and me as far as EE and they’ve been focusing mainly on the schools. (V, 18, 1) (14.MARENA) (5.FUNCOD; 14.FUNCOD; 2.K12)
- Her job has been organizing commissions in the different areas in Carazo and helping the rural areas, places called “comarques” which are the small communities outside of the urban area, to form their own commissions so they can work within their own community. So, mainly working with this with MARENA and with myself. She’s trying to give incentive to these people to solve their own problems. (V, 18, 1) (14.MAR) (7.COM; 2.CMS)
- In the past it was thought that MINSA was not responsible for this kind of education but now that they have been seeing that both types—as in education about public health and education about the environment—have a connection on the health of the people nearby. It was thought before to be the problem of MARENA but the vision has changed now and with this acknowledgment of the connection they are able to see that such things as contaminated rivers and garbage problems are the leading factors to their health problems. (II, 22, 1) (14.MARENA) (14.MINSA; 2.HEA)
- This is for the educational 60 hours, that MARENA put out, and this is the guide for teachers on how to work on those 60 hours for teachers. It talks about the problems. This is how you would resolve the problems. These are your resources that you can use to help you to plan your 60 hours—this is for all of Nicaragua. This is showing, this is what they’re supposed to be doing with their classes. They’re supposed to be identifying problems with the students and making solutions. Like here it says that the principal problem is garbage, that the kids think it is. Then they write down what they think the effects of that problem would be then they plan solutions then they look at the resources they have to put together these solutions. This was put out by Jorge Luis Hernandez—who was with MED but is now with MARENA. (V, 23, 4) (14.MARENA) (3.TNG; 2.ECO)

- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (14.MAR) (2.CMS; 14.CEC; 14.FUN; 14.POS; 5.GER)

14.MD = media

- Partnerships—seminar for the media to improve environmental journalism (VI, 2, 3) (14.MD) (XX)
- Another area in which we've been trying to focus and figure out is the media. We keep a file of articles relating to the environment in Nicaraguan newspapers—tracking which ones are positive/negative, what newspaper, what day, reporter's name, environmental issue. Have invited the press to many meetings but they don't show up—are not interested. Seem to have problems with/a dislike for MARENA—usually reporting negatively on them and their projects. (VI, 2, 9) (14.MD) (XX)

14.MOPAFMA = MOPAFMA

- He said that, to be honest, he thinks that as a group MOPAFMA doesn't really exist in Carazo. It's really just one person. Mostly they just supply bags and seeds to that people can start tree nurseries. They don't have their own offices and don't have their own tree nurseries. He said that they have helped establish nurseries and one of them is in an area called Santa Teresa, another town in Carazo, and they started a tree nursery there of 200,000 plants but they didn't watch it very closely. It started with the mayor's office. But now they've all grown too big—too big to be planted—past where they could be replanted and that's a problem. He doesn't understand exactly what went wrong with that project. It was meant to be for the small producers of the area to use. (V, 23, 2) (14.MOPAFMA) (2.TREE)
- They have another nursery—it's before the little bridge in El Rosario and he said he's not sure how many plants they have there but it's not really *their* nursery—they help facilitate it. (V, 23, 2) (14.MOPAFMA) (2.TREE)

14.MED = MED

- One of the good things is that the government passed a law that high school students, in order to graduate, they have to donate 60 hours of their time to ecological social service. Must get involved with ecological activities and must get the permission of the Ministry of Health and Ministry of Education and approval of the institution. (II, 1, 8) (14.MED) (XX)
- [Interviewer] What organizations are also interested in helping? Besides Peace Corps, FUNCOD, MAN, other NGOs? [Subject] Ministry of Education. (II, 1, 9) (14.MED) (XX)
- We worked hard last year with the Ministry of Education and right now we are, education and MARENA, are working on an assignment through a grant, and in order to push the environmental education at the Ministry of Education. And we have a lot of frustration but the vice minister is very, very interested in this subject of environmental education (I, 6, 5) (14.MED) (10.VERT)
- Above her [WHO?] is Martilisia DeNovio who is the director of the high school, with whom the vice-minister is working on this compendium in order to relate the communities of the POSAF project and the TROPISEC project, to make a relation between these environmental education and other projects which are spread in a lot of municipalities, a lot of very important municipalities, but it will take time – because we need to prepare the conference and that takes time. (I, 6, 6) (14.MED) (11.COORD; 14.CEC; 14.POSAF)
- One very important thing is happening that many organizations like the scouts and some other organizations are beginning to get in touch with the Ministry of Education and showing their interest in environmental education. Right now, [I'm] at the stage of organizing all these things and [I expect] that in about a month [I] will have a structure better defined once all the teachers go back to the academic year, because right now you know they're on vacation. But right now, [I'm] in the stage of organizing these things and all these associations and organizations are interested to become involved with environmental education. (I, 11, 2) (14.MED) (12.SCO)
- Some agreements have been agreed on between MARENA and MED but they seem to be being revised. They haven't been put out the public yet but [I'm] expecting that pretty soon the sphere of this agreement will be known to the public so that they can make good use of it. Most of the supporting institutions and organizations that have cooperated with MED have been MARENA and FUNCOD. (I, 11, 4) (14.MED) (14.MARENA; 14.FUN)
- Working with schools through an agreement with the Minister of Education (MED), [Peace Corps is] working on supporting school primary school teachers, mainly in rural

communities, to incorporate EE which is in the curriculum but is not always implemented. We are doing that in different regions, covering almost all populated Nicaraguan regions. There is a curriculum transformation right now from first to third grade so they are doing/promoting active education and local knowledge and we are working from first through sixth grade so not only including the first three grades who are working with MED but also the upper three grades. (VI, 13, 3) (14.MED) (2.K12; 8.K)

- The difficult part of EE is that you get a lot of qualitative results—we can measure the number of students and teachers, the number of charlas [talks] volunteers have provided but the most important part is qualitative change and that is difficult even for the volunteers to see that they are making a difference. So, we (myself and someone from MED) are trying to develop a monitoring system that is more long term—using specific indicators that will help the volunteer to find out that they are doing something. (VI, 13, 7) (14.MED) (XX)
- I have a committee in Panama that is also working with Peace Corps in EE but they started working in curriculum development with the MED so they created for each grade a manual. This is the 2nd grade—it has all the different courses: Spanish, math, natural science, and each one has objectives, a topic and a dynamic. We started using this with the Nicaragua curriculum and came up with this guide created by a Peace Corps volunteer and the MED in the community. What she did was using this to incorporate EE into the Nicaragua curriculum. Now it says for each course from 1st to 3rd grade what to do. (VI, 13, 9) (14.MED) (4.CURR)
- It is used only by the Peace Corps volunteers because we don't have the money to use it with the teachers. I wrote a grant trying to find the funds but we didn't get it. We will have, in October, a group meeting of all EE volunteers to incorporate this. There is more information that they have developed. They will have one manual just in case we have the money in the future so hopefully the teachers will have them. We're planning to introduce this manual to the Minister of MED so he can lobby somewhere for the money. (VI, 13, 9) (14.MED) (9.WRK; 6.\$)
- It is lack of resources and also, one that is indirect but is important is the salary that they make. Usually teachers are paid, on average, the equivalent to \$50/month and they work very hard. So, they don't have that incentive to get better. (VI, 13, 11) (14.MED) (2.TTNG; 9.INS; 9.PRE)
- MED works with . . . MARENA on the ecological brigades and their reforestation and clean-up plans. (II, 16, 1) (14.MED) (14.MARENA, 2.REF, 2.TRAS)

- For example, the Ecological Brigade in San Marcos, with the help of the mayor's office, is cleaning up the river. The MED does not have the resources to give transportation support so we made an agreement with the heads of households and they pay the gas and MED gives the bus. We have economic and human resources to continue and control the reforestation and environmental projects, and the jurisdictional aspect. (II, 16, 2-3) (14.MED) (6.\$, 14.PRIV, 2.ECO)
- She says that it is secure that they'll use this guidebook. They've had two meetings with the curriculum directors at MED and they're very excited about it and they like the form because up to this point Nicaragua hasn't had a guide book for EE. (IV, 20, 2) (14.MED) (2.CURR)
- She said [MED has] supported the idea, they haven't supported the guidebook. At first they had problems with the central MED here in Managua. She believes that they were a little but jealous because they were developing the guidebook. They started working in the Masaya area and the local offices of MED were giving them a lot of support and they were talking to the central offices and telling them that this was a really good guide book and that they really liked it. So, she is hoping now that the central office will like it and that they'll get more support. (IV, 20, 2) (14.MED) (10.GOVT)

14.MINSA = MINSa

- one of the good things is that the government passed a law that high school students, in order to graduate, they have to donate 60 hours of their time to ecological social service. Must get involved with ecological activities and must get the permission of the Ministry of Health and Ministry of Education and approval of the institution. (II, 1, 8) (14.MINSA) (XX)
- [MARENA's] technicians are helping to visit the different schools in the area along with a representative of the Ministry of Health. (II, 1, 8) (14.MINSA) (XX)
- [Interviewer] What organizations are also interested in helping? Besides Peace Corps, FUNCOD, MAN, other NGOs? [Subject] Ministry of Health. (II, 1, 9) (14.MINSA) (XX)
- Just the other day I was walking down the street and there was a Ministry of Health truck with loudspeakers broadcasting a message about not throwing your trash in the water supply—how that causes contamination and sickness. NC: Yes, the Ministry of Health is also involved with environmental education. They focus on health related environmental issues such as water quality and contamination. (VI, 2, 9 & 10) (14.MINSA) (XX)
- We have been trying to target people from different sectors to stand on the commission to get an idea of what the needs are in El Rosario right now. For instance, people from the

Centro de Salud [health center] have concerns about the contaminated water that people are throwing in the streets and the mosquitoes that breed in it because they've seen a rise in the number of cases of diarrhea and dengue. (VI, 4, 2) (14.MINSA) (XX)

- The Centro de Salud [health center] works with the school's health brigade, and we formed an Ecological Brigade at the school so a lot of it is just the coordination of the activities between the groups represented on commission: the Alcaldía [mayor's office], Centro de Salud [health center], [municipal] police, and the brigades. (VI, 4, 3) (14.MINSA) (2.BRIG; 14.ALC)
- In the past it was thought that MINSA was not responsible for this kind of education but now that they have been seeing that both types—as in education about public health and education about the environment—have a connection on the health of the people nearby. It was thought before to be the problem of MARENA but the vision has changed now and with this acknowledgment of the connection they are able to see that such things as contaminated rivers and garbage problems are the leading factors to their health problems. (II, 22, 1) (14.MINSA) (2.HEA; 14.MARENA)
- She said that, with health education, in every area, SILAS works within the communities—with talks within the communities—with speaker systems they have on the top of trucks, posters, announcements—in some communities it's more effective than in others. That's mainly because in some communities there's more emphasis or more health problems so they emphasize more in some communities than in other communities. (II, 22, 1) (14.MINSA) (2.CAM; 2.HEA)
- This is a study done by the doctor that is specializing in pesticides, this is the pesticide program [SILAS—part of MINSA] and it talks about the health status of the people who work in Plastinique, which is one of the biggest plants in Carazo. And this is what her study found on that part of contamination, in regards to health issues. (V, 23, 3) (14.MINSA) (2.HEA; 2.PEST)
- This is also [a study done] on pesticides and it talks about, in our department, how many people have been intoxicated by pesticides and have had to go to the hospital and this is between 1995 and 1996. SILAS is part of the Ministry of Health. (V, 23, 4) (14.MINSA) (2.STU)

14.NAAEE = North American Association for Environmental Education

- Like, this year we're going to have here in Nicaragua a big conference of environmental education that NAAEE is doing—this April. We are going to receive people from different countries from Latin America and NAAEE is going to bring book packages for environmental education already translated into Spanish. And I already saw some of those books and they are really very great—information for all of the outdoor educators. (I, 6, 3) (14.NAAEE) (3.CURR; 3.TEXT; 2.CONF)

14.NAT = Nature Conservancy

- The Nature Conservancy is involved in Bosawas [nature reserve in northern Nicaragua. (VI, 2, 8) (14.NAT) (XX)

14.PC = Peace Corps

- So, lack of a knowledge of what was a tree nursery and what went into making a tree nursery and what went into running a tree nursery. So, when Peace Corps came to Diriamba to see if they were interested in having a volunteer they said, "Sure, we have this tree nursery project—we'll have a volunteer for it." (VI, 3, 1) (14.PC) (XX)
- Other environmental non-government organizations like FUNCOD and MAN and noted that they have also contacted [MED] besides the scouts and the Peace Corps. (I, 11, 2) (14.PC) (14.MAN; 14.FUN)
- If anyone decided to do an EE program, we would be more than happy to cooperate. What we don't want to do is to be working along with other people working in the same direction but separate because then it's a lot more difficult and if we don't have the resources, maybe other people will have them. The commitment we have is one that when we did the needs assessment to develop this program, that was one of the components that even NGOs talked about—we have to work on formal education. (VI, 13, 12) (14.PC) (XX)

14.POS = POSAF

- If we implement these projects with an EE program parallel to it, our chances to reduce these illegal activities are getting better; one of these projects is called the POSAF, Projecto Social Ambientale y Forestale (Social, Environmental, and Forestry in Development Project) financed by Inter-American Bank of Development to promote agroforestry. (II, 1, 5) (14.POS) (XX)

- Through POSAF we are requesting to Farmer-to-Farmer project, we're requesting to have an agroforestry specialist come there. (II, 1, 11) (14.POS) (XX)
- Many are working on agroforestry, agriculture projects and have an environmental education component. For example, POSAF (located across the hall from GreenCOM) is focusing on agroforestry but have an education component as well. They have a representative in the Carazo department—don't know much about what exactly they do. (VI, 2, 8) (14.POS) (XX)
- Above her [WHO?] is Martilisia DeNovio who is the director of the high school, with whom the vice-minister is working on this compendium in order to relate the communities of the POSAF project and the TROPISSEC project, to make a relation between these environmental education and other projects which are spread in a lot of municipalities, a lot of very important municipalities, but it will take time because we need to prepare the conference and that takes time. (I, 6, 6) (14.POS) (11.COORD; 14.CEC; 14.MED)
- He said that [the Jinotepe mayor's office has] been receiving a lot of help from POSAF. They're the ones that have been helping with a reforestation plan for Jinotepe. They have large projects for reforestation and their goal is to reforest the watershed area of the Rio Grande. (III, 21, 2) (14.POSAF) (2.REF)
- Right now there are no projects of the commission—it's more or less of the objective of motivator, a meeting place, a place for exchange, an incentive. The members can be anybody that has an interest in environmental education in the department but they do have about 7 coordinators which would be Silvio Echaverry, on the part of MARENA; [I represent] the part of CECOTROPIC and [I'm] also the secretary—it's kind of part of what [I want] to do; Isolda Coca, from FUNCOD; the mayors of Jinotepe and Diriamba; they have the representative of POSAF in the department; and they also have an assessor that helps out—she's paid by a German group that pays for technical assistance and she helps out. (V, 23, 8) (14.POS) (2.CMS; 14.MAR; 14.CEC; 14.FUN; 5.GER)

14.PRIV = Private sector

- [Interviewer] What organizations are also interested in helping? Besides Peace Corps, FUNCOD, MAN, other NGOs? [Subject] Rotary Club. (II, 1, 9) (14.PRIV) (XX)
- Seminar for private sector partnerships in conservation (probably focus on ecotourism). (VI, 2, 3) (14.PRIV) (XX)

- For example, the Ecological Brigade in San Marcos, with the help of the mayor's office, is cleaning up the river. The MED does not have the resources to give transportation support so we made an agreement with the heads of households and they pay the gas and MED gives the bus. We have economic and human resources to continue and control the reforestation and environmental projects, and the jurisdictional aspect. (II, 16, 2-3) (14.PRIV) (6.\$, 2.ECO, 14.MED)

14.PROS = PROSESUR

- I forgot to tell you about PROSESUR, another project ascribed to national program of rural development which has just established offices in Jinotepe; will work in Rivas, Carazo, and parts of Managua; have emphasized that they will work in agroforestry and organic agriculture and soil and water conservation. They have a lot of money—being financed by the European Union, Inter-American Bank of Development, and World Bank; technical committee of POSAF at the Carazo level is integrated by MARENA, by the technician of POSAF, two representatives of two municipalities and one representative from this project. (II, 1, 9) (14.PROS) (XX)
- [Representatives from the Jinotepe mayor's office] have been attending meetings and workshops with PROSESUR but they haven't yet resulted in any projects or any help besides the workshops and meetings. (III, 21, 2) (14.PROS) (XX)

14.UNA = UNA

- [Interviewer] What organizations are also interested in helping? Besides Peace Corps, FUNCOD, MAN, other NGOs? [Subject] UNA (Universidad Nacional Agraria). (II, 1, 9) (14.UNA) (XX)
- Two other people are working with us [on putting together the environmental commission]—one person from UNA and ... (II, 1, 11) (14.UNA) (XX)
- Francisco Salmeron, UNA, has an agreement with a Swedish university, professors from the university do their postgraduate work with this university; they do their research in Nicaragua and go and do paperwork and analysis in Sweden (II, 1, 11) (14.UNA) (XX)

15. EE PROGRAMS IN PLANNING FOR FUTURE IMPLEMENTATION

15.BRIG = ecological brigade (K-12)

- Start off with that, with some kind of meeting project where they go around and do that with each neighborhood and finding the neighborhoods that have serious problems that they want to solve. And then forming some kind of project, maybe with the 60 hours in the schools, where the kids go in and help them with this problem and helping them find the resources. (VI, 3, 5) (15.BRIG) (XX)

15.CAM = campaign

- The Commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (???) (15.CAM) (15.SW; 8.TEACH)

15.COMM = community programs

- [MED is] not going to work on this environmental education issue as a department but through the interests of the people that are conscious of the needs of environmental education so this is not a structure in environmental education but it is through the interest of people who have already developed an interest in the issue—and [we're] going to get them together and that's the way [we're] going to work. (I, 11, 2) (15.COMM) (XX)

15.CURR = curriculum guide

- Working to produce a book on sea turtle life cycle for schools along the Pacific coast, especially in La Flor and for other areas with turtle beaches (VI, 2, 7) (15.CURR) (XX)
- Right now we are trying to carry out or design an EE program for Granada that is specifically for the municipality so that's why I'm very interested in your design—because I'm doing the same effort and we might share documents and efforts. We have two girls and a Canadian consultant doing this program. We are doing it as a pilot project. (I, 5, 2-3) (15.CURR) (XX)

15.GINT = interpretive guide

- MARENA uses a general EE guide which park personnel use in all protected areas—working to help parks develop their OWN materials—specific to their area. [The guide being

developed by GreenCOM] will be available to the public upon visiting the parks and others depending on the objectives of the materials. (VI, 2, 7) (15.GINT) (XX)

15.K12 = K-12 program

- The [Ecological Museum of Tropical Dry Forests] is working on a project that will make the entrance fee free for rural students. (IX, 14, 1) (15.K12) (XX)

15.NATL = national strategy

- She said that they're going to work on a central, national strategy—there's not going to be a regional thing. It's going to be flexible, so you could adapt it to local conditions, to get at the local people as far as local needs are concerned, local resources are concerned to get this environmental education as an in-service training according to the circumstances and conditions of each community, of each locality and getting people that are interested and love environmental education, getting them involved in the environmental education strategies that are going to be implemented on the local levels, using of course the central design as a guideline but not as a rigid framework but in a flexible way. (I, 11, 3) (15.NATL) (9.INS)

15.NW = network of EE organizations/institutions

- We [MARENA through the national conference] have a network we're trying to organize (I, 6, 3) (15. NW) (XX)

15.TRAS = trash clean up (not on school grounds)

- Our next big project is trash—they had a senior who came around and picked up trash in the streets but they've had a lot of problems with that because he can't handle the volume of trash and he's been sick. The Alcadia [mayor's office] hasn't been charging for trash collection and they just don't have the manpower to run it. They're trying to change the trash program to set up something like they have in Leon (with the organic trash collected—they hope to generate revenues from compost). (VI, 4, 4) (15.TRAS) (1.SW)

15.SOL = solar ovens

- Some projects [POSAF] would like to work on are stove projects to get people to use a more energy saving and environmental stove. (V, 7, 1) (15.SOL) (XX)

15.SW = solid waste management programs

- [POSAF is] also trying to prompt projects on waste management. (V, 7, 1)
- The commission is working on a project to educate educators about the garbage problem in the urban areas, to start a campaign focusing on educating the public about a clean environment/garbage. (???????) (15.SW) (8.TEACH; 15.CAM)

15.UNIV = university level program

- Trying to get extension through UNA involved in area of EE so that they can transfer the education to the people who will benefit. (II, 1, 6) (15.K12) (XX)
- We're going to have an extension of the agricultural university there [in Carazo]. (II, 1, 11) (15.K12) (XX)

Appendix M-1
Teacher Survey: Coding Chart

Teacher Survey Codes

1. In your own words, define environmental education.

A/S = awareness of and sensitivity to nature and the environment
ACT = action component
AES = aesthetic component
A/V = affects/forms people's attitudes and values toward environment
CLE = focused on cleanliness
FUT = preserves/protects environment for future generations
HEA = focused on human health issues
HYG = hygienic reasons
INTER = focused on interrelationships between humans and the environment/nature
ISS = focused on certain environmental issues
KNOW = focus on environmental knowledge
LAW = legal component
LOC = focused on the local environment, local issues
NR = dealing with natural resources
P/C = preservation/conservation component
RESP = responsibility component
TOT = totalitarian view, encompasses everything
UTIL = utilitarian attitude toward the environment

2. Do you think it's important to teach about the environment? Please explain why or why not.

A/S = awareness of and sensitivity to nature and the environment
ACT = action component
AES = aesthetic component
A/V = affects/forms people's attitudes and values toward environment
CLE = focused on cleanliness
FUT = preserves/protects environment for future generations
GOV = governmental component
HEA = focused on human health issues
HYG = hygienic reasons
INTER = recognition of the interrelationships between humans and the environment/nature
ISS = focused on certain environmental issues
KNOW = focus on environmental knowledge
LAW = legal component
LOC = relating to the local environment
NR = natural resources component
P/C = preservation/conservation component
REL = religious reasons (Nature/the environment is God's creation and we must take care of it.)
RESP = responsibility component
TOT = totalitarian view, refers to "everything that is around us"

3. Have you included teaching about the environment in your classes? If you have included it, please describe in what manner.

ACT = citizen action component
ACT-CLE = action component—cleaning school or community
ACT-GARDEN = action component—planting a class garden
ACT-REF = action component—reforestation project
ACT-SW = action component—solid waste management project
ART = included in art class(es) or as topic of art project
ATV = activities
CIV = included in civics or social studies class(es)
DIS = class discussions on topic
FIE = field studies of the local environment
HEA = included in health class(es)
INF = infusion or integration into all topics
ISS = environmental issues in general
ISS-A/S = awareness/sensitivity issues
ISS-AIR = air quality issues
ISS-ANI = animal issues
ISS-CLE = cleanliness issues
ISS-CLI = climate change issues
ISS-DEF = deforestation issues
ISS-FUT = futures thinking-related issues
ISS-H2O = water quality or contamination issues
ISS-HYG = hygiene issues
ISS-OZO = ozone depletion issues
ISS-P/C = preservation/conservation issues
ISS-REF = reforestation issues
ISS-SW = solid waste issues
ISS-TOX = toxic waste issues, issues pertaining to toxics in the environment
LAB = included in orientation laborale
MAT = included in math class(es)
MOR = included in moral class(es)
SCI = included in science class(es)
SPA = included in Spanish class(es)
SPE = presented in a speech to class
WRI = included as a topic in writing assignment(s)
WRK = presented in workshop

4. According to your definition, have you had training specifically in environmental education? If you have had it, when and where? Provided by which organization or government agency? Please describe it briefly.

FUNCOD = provided by FUNCOD
HEA = provided by a health-related organization (not MINSA)
MARENA = provided by MARENA
MAY = provided by the mayor's office
MED = provided by MED
NOR = provided in the normal school

PC = provided by the Peace Corps
SELF = self-taught through reading, attending lectures, television
UNIV = university talk or course

11. Have you had special training for being a teacher. If so, please describe.

PROVIDERS:

MED = MED
NIPA = Nicaraguan Institute of Public Administration
NOR = normal school
SIMEN = SIMEN
UNIV = university courses

DESCRIPTION OF TRAINING:

CAP = capacitation workshops or classes
COMP = computer training
DIS = discipline training
EDUC = basic educational theories or philosophies
HS = high school training
LD = learning disabilities training
MAT = training in mathematics
METH = teaching methodologies
MID = middle school training
PRI = primary school training
PSY = psychology training

12. Since you've been teaching, have you had additional instruction? If so, in which subjects or areas of study? Please describe the training.

ALL = all areas
ART = arts
BUS = business training (accounting, secretarial training, program management, etc.)
CC = civil construction
CUR = curricular transformation
DIST = distance learning
ED = educational theories
ENG = English
ENV = environmentally-related topic
GEO = geography
HEA = health-related topics
HIST = history
HR = human relations
LAB = orientacion laboral
LD = learning disabilities
LIB = library training
LIN = linguistics training
MAT = mathematics
METH = teaching methodologies
MIC = capacity building training

PE = physical education
PRE = preschool training
PSY = psychology
REL = religious training
SCI = science
SPA = Spanish
SS = social studies
VAL = values education

TRAINING PROVIDERS

BAN = Banco Leon
MARENA = MARENA
MAY = mayor's office
MED = MED
SIMEN = SIMEN
UNESCO = UNESCO
UNICEF = UNICEF
UNIV = university

Appendix M-2
Teacher Survey: Qualitative Data Document

1. In your own words, define environmental education.

1.A/S = awareness of and sensitivity to nature and the environment

10/83 = 12%

- It is to teach to the people to be sensitive to the world we live in and to feel love for the future generations. (5C) (1.A/S) (1.FUT)
- It is education that should be taught from infancy to prepare the individual because through this knowledge, they learn the importance of caring about and protecting the environment and thus avoid progressive deterioration and its grave consequences and learn to conserve resources. (42E) (1.A/S) (1.KNOW, 1.P/C, 1.NR)
- Develop in children a love of the environment so they recognize its importance for living beings and awaken an interest in conservation. (43E) (1.A/S) (1.P/C)
- It is ecological conservation in conjunction with, above all, the care that we should have for nature. (47B) (1.A/S) (1.P/C)
- To make people of all ages conscious about our environment and how it is necessary and useful for our lives. (48E) (1.A/S) (1.UTIL)
- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.A/S) (1.P/C, 1.ATT, 1.ACT, 1.KNOW, 1.INTER)
- It is the rational treatment of our natural resources, the appreciation that we can give to that which surrounds us. (58E) (1.A/S) (1.NR)
- Environmental education to me is all that surrounds us, all of nature; and it is through education, sensitivity of all people, that we can conserve the environment. (61E) (1.NR) (1.TOT, 1.P/C)
- To learn the importance of caring for our environment. To integrate the people so that they value and recognize the importance of the environment. (77I) (1.A/S) (1.VAL)
- It is the teaching that brings people closer to the environment that surrounds us and teaches how to care for it so we have a better world. (80J) (1.A/S) (1.P/C, 1.TOT)

1.ACT = action component

3/83 = 4%

- Teach the children to plant trees. Do not contaminate the rivers or the trees and the forest and the flora and fauna. I believe that it means that we do not destroy the forests or the animals and to teach the children that we have to take care of our environment. (1E) (1.ACT) (1.ISS)
- Environmental education is the capacity to promote and develop actions to improve the quality of human life. (38E) (1.ACT) (1.INTER)
- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.ACT) (1.P/C, 1.ATT, 1.A/S, 1.KNOW, 1.INTER)

1.AES = aesthetic component

2/83 = 2%

- I consider that environmental education is teaching and describing the most important ways more to make a healthier and more agreeable environment for human beings. (11A) (1.AES) (1.HEA)
- There are a group of guidelines and principles that we teach the population with the objective of preserving the environment in the proper condition to keep a high level of hygiene, aesthetics, and all that is around us. (16D) (1.AES) (1.P/C, 1.HYG, 1.TOT)

1.A/V = affects/forms people's attitudes and values toward environment

9/83 = 11%

- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.A/V) (1.P/C, 1.A/S, 1.ACT, 1.KNOW, 1.INTER)
- Environmental education is to teach to the students about the environment, how it is interrelated and who is participating, the importance, their objectives, their successes. It is to educate to respect and value nature. (8A) (1.A/V) (1.KNOW, 1.INTER)

- There are values passed to the new generations with the objectives that they use them to guarantee a better social future, environment, health, etc. (19G) (1.A/V) (1.FUT, 1.HEA)
- Is to prepare our society from an early age to know how to value the environment's natural resources and the importance of preserving the environment without a lot of contamination. (21G) (1.A/V) (1.NR, 1.P/C, 1.ISS)
- It is imparting the knowledge of the values of nature as in social, moral, and cultural. (24G) (1.A/V) (XX)
- To teach to develop and to educate the children, the young people to take care of the environment that surrounds us and to learn to value the natural, social and cultural resources. (30E) (1.A/V) (1.P/C)
- To teach to take care of the environment and its utilization and destruction if we don't take care of it. (34B) (1.A/V) (1.P/C, 1.UTIL)
- To learn the importance of caring for our environment. To integrate the people so that they value and recognize the importance of the environment. (77I) (1.A/V) (1.A/S)
- It is important because from this comes the development of values. (82B) (1.A/V) (XX)

1.CLE = focused on cleanliness

7/83 = 8%

- Environmental education is what one teaches to the students in that they should participate in cleaning up the school, their home, etc. (13A) (1.CLE) (XX)
- Environmental education is to make people conscious of keeping the environment clean, suitable for better development of the population, as well as the environment that surrounds us. (17D) (1.CLE) (XX)
- To look for the necessary ways to keep the place where we are living clean. (26E) (1.CLE) (XX)
- It is important to maintain a clean environment to care for sicknesses. Plant trees. (63E) (1.CLE) (1.HEA, 1.ISS)
- My environmental education is to direct and maintain cleanliness of all that which surrounds us—direct how we should protect the plants, forests and maintain cleanliness in our homes and schools. (69A) (1.CLE) (1.P/C)
- It is important because it reflects what each place needs. That is to say, the care for and cleaning of a place for the health of the town. (70A) (1.CLE) (1.LOC, 1.HEA)

- Environmental education is no more than the physical and biological preparation of every person and their surroundings. Also, I want to say that we should keep our homes, schools, and all places where we are involved healthy. To transmit our knowledge about how to protect the environment. (73A) (1.CLE) (1.LOC, 1.HEA, 1.KNOW)

1.FUT = preserves/protects environment for future generations

3/83 = 4%

- It is to teach to the people to be sensitive to the world we live in and to feel love for the future generations. (5C) (1.FUT) (1.A/S)
- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.FUT) (1.RESP, 1.UTIL, 1.NR, 1.HYG, 1.HEA)
- There are values passed to the new generations with the objectives that they use them to guarantee a better social future, environment, health, etc. (19G) (1.FUT) (1.VAL, 1.HEA)

1.HEA = focused on human health issues

8/83 = 10%

- I consider that environmental education is teaching and describing the most important ways more to make a healthier and more agreeable environment for human beings. (11A) (1.HEA) (1.AES)
- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.HEA) (1.RESP, 1.UTIL, 1.NR, 1.HYG, 1.FUT)
- There are values passed to the new generations with the objectives that they use them to guarantee a better social future, environment, health, etc. (19G) (1.HEA) (1.VAL, 1.FUT)
- To have environmental knowledge and education is knowing how to protect and help maintain a healthy environment where we live. (52H) (1.HEA) (1.KNOW, 1.P/C, 1.LOC)
- It is important to maintain a clean environment to care for sicknesses. Plant trees. (63E) (1.HEA) (1.ISS, 1.CLE)

- It is important because it reflects what each place needs. That is to say, the care for and cleaning of a place for the health of the town. (70A) (1.HEA) (1.LOC, 1.CLE)
- Environmental education is no more than the physical and biological preparation of every person and their surroundings. Also, I want to say that we should keep our homes, schools, and all places where we are involved healthy. To transmit our knowledge about how to protect the environment. (73A) (1.HEA) (1.LOC, 1.CLE, 1.KNOW)
- Environmental Education: To know and put into practice priorities that protect, that underline . . . to the well-being and preservation of nature, health, and hygiene. (75I) (1.HEA) (1.HYG, 1.P/C)

1.HYG = hygienic reasons

3/83 = 3%

- There are a group of guidelines and principles that we teach the population with the objective of preserving the environment in the proper condition to keep a high level of hygiene, aesthetics, and all that is around us. (16D) (1.HYG) (1.P/C, 1.AES, 1.TOT)
- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.HYG) (1.RESP, 1.UTIL, 1.NR, 1.HEA, 1.FUT)
- Environmental Education: To know and put into practice priorities that protect, that underline . . . to the well-being and preservation of nature, health, and hygiene. (75I) (1.HYG) (1.HEA, 1.P/C)

1.INTER = focused on interrelationships between humans and the environment/nature

6/83 = 7%

- It is education that goes into the development of the individual in relation with the environment that surrounds them. (4C) (1.INTER) (XX)
- Environmental education is to teach to the students about the environment, how it is interrelated and who is participating, the importance, their objectives, their successes. It is to educate to respect and value nature. (8A) (1.INTER) (1.KNOW, 1.VAL)
- Environmental education is the capacity to promote and develop actions to improve the quality of human life. (38E) (1.INTER) (1.ACT)

- It is a way to determine interrelations between humans and nature, actions which generate the protection of some and benefit man. (39E) (1.INTER) (1.P/C, 1.UTIL)
- It is everything having to do with the interrelations between humans and nature. (41E) (1.INTER) (XX)
- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.INTER) (1.P/C, 1.ATT, 1.A/S, 1.ACT, 1.KNOW)

1.ISS = focused on certain environmental issues

8/83 = 10%

- Teach the children to plant trees. Do not contaminate the rivers or the trees and the forest and the flora and fauna. I believe that it means that we do not destroy the forests or the animals and to teach the children that we have to take care of our environment. (1E) (1.ISS) (1.ACT)
- Environmental education is taking care of the earth and soil, and the natural resources that exist in our environment, to keep our climate nice. (7C) (1.ISS) (1.P/C, 1.NAT)
- Is to prepare our society from an early age to know how to value the environment's natural resources and the importance of preserving the environment without a lot of contamination. (21G) (1.ISS) (1.NR, 1.VAL, 1.P/C)
- Environmental education is to teach our children or the community where we work to keep our environment free of garbage and to take care of cleaning our surroundings, planting trees, protecting our natural resources. (25E) (1.ISS) (1.P/C, 1.NR)
- It is the way to introduce environmental conservation to the society; to conserve our natural resources—looking for and applying ways to not contaminate them. (50F) (1.ISS) (1.P/C, 1.NR)
- Environmental education refers to the contamination problems that exist in our environment, above all in the place where the Diriamba municipal landfill [dump] is. (53H) (1.ISS) (XX)
- It is important to maintain a clean environment to care for sicknesses. Plant trees. (63E) (1.ISS) (1.HEA, 1.CLE)
- It is the study of the environment and the problems that face it, the causes and consequences that occur in nature. (65E) (1.ISS) (1.KNOW)

1.KNOW = focused on environmental knowledge

16/83 = 19%

- Environmental education is to teach to the students about the environment, how it is interrelated and who is participating, the importance, their objectives, their successes. It is to educate to respect and value nature. (8A) (1.KNOW) (1.INTER, 1.VAL)
- Our knowledge that we teach to maintain the environment, or what remains of the environment, and improve it for the well-being of human beings. (22G) (1.KNOW) (1.UTIL)
- It is teaching children and adults about the environment—its importance and utilization. (23G) (1.KNOW) (1.UTIL)
- Teachings about the knowledge of our environment and the conservation and preservation of our natural resources, and its limited use and protection. (36B) (1.KNOW) (1.UTIL, 1.P/C, 1.NR)
- It is education that should be taught from infancy to prepare the individual because through this knowledge, they learn the importance of caring about and protecting the environment and thus avoid progressive deterioration and its grave consequences and learn to conserve resources. (42E) (1.KNOW) (1.A/S, 1.P/C, 1.NR)
- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.KNOW) (1.P/C, 1.ATT, 1.A/S, 1.ACT, 1.INTER)
- To have environmental knowledge and education is knowing how to protect and help maintain a healthy environment where we live. (52H) (1.KNOW) (1.P/C, 1.HEA, 1.LOC)
- To better the teaching of the children about the environment. (54E) (1.KNOW) (XX)
- It is the knowledge that it acquired for the preservation of all that is around us. (55E) (1.KNOW) (1.P/C)
- It is the realization that we should all have to know how to rationally utilize natural resources. (56E) (1.KNOW) (1.UTIL, 1.NR)
- It is the study of all that relates to the environment that surrounds us. (57E) (1.KNOW) (1.TOT)
- It is all that refers to the environment, how we should protect and study it. (59E) (1.KNOW) (1.TOT, 1.P/C)

- Environmental education is the knowledge that each of us has about the environment, plus what we as educators transmit to our students, for its preservation and conservation. (64E) (1.KNOW) (1.P/C)
- It is the study of the environmental and the problems that face it, the causes and consequences that occur in nature. (65E) (1.KNOW) (1.ISS)
- To have knowledge of all the benefits the environment offers and all that it encompasses. Also to be conscious of its grand importance and the urgency for preserving it. (67E) (1.KNOW)(1.UTIL)
- Environmental education is no more than the physical and biological preparation of every person and their surroundings. Also, I want to say that we should keep our homes, schools, and all places where we are involved healthy. To transmit our knowledge about how to protect the environment. (73A) (1.KNOW) (1.LOC, 1.CLE, 1.HEA)

1.LAW = legal component

2/83 = 2%

- To teach to take care of the environment through the principles and rules that we have to take into account. (20G) (1.LAW) (1.P/C)
- It is understood to be environmental education in a rigorous line that should preserve our natural environment. It is the discipline, laws that obligate the community of care for their environment. (49F) (1.LAW) (1.LOC, 1.P/C)

1.LOC = focused on the local environment, local issues

5/83 = 6%

- Environmental education is to maintain and constantly care for our environment, in the school and also in the community, teaching the population about its maintenance and improvement. (32B) (1.LOC) (1.P/C)
- It is understood to be environmental education in a rigorous line that should preserve our natural environment. It is the discipline, laws that obligate the community of care for their environment. (49F) (1.LOC) (1.LAW, 1.P/C)
- To have environmental knowledge and education is knowing how to protect and help maintain a healthy environment where we live. (52H) (1.LOC) (1.KNOW, 1.P/C, 1.HEA)

- It is important because it reflects what each place needs. That is to say, the care for and cleaning of a place for the health of the town. (70A) (1.LOC) (1.HEA, 1.CLE)
- Environmental education is no more than the physical and biological preparation of every person and their surroundings. Also, I want to say that we should keep our homes, schools, and all places where we are involved healthy. To transmit our knowledge about how to protect the environment. (73A) (1.LOC) (1.CLE, 1.HEA, 1.KNOW)

1.NR = dealing with natural resources

16/83 = %

- Environmental education: It is the care, protection, and conservation of all the natural riches (treasures) that the environment possesses. (3C) (1.NR) (1P/C)
- Environmental education is taking care of the earth and soil, and the natural resources that exist in our environment, to keep our climate nice. (7C) (1.NR) (1.P/C, 1.ISS)
- Is the creation of activities that function to protect the environment, when the necessity of taking care to preserve our resources is explained. (12A) (1.NR) (1.P/C)
- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.NR) (1.RESP, 1.UTIL, 1.HYG, 1.HEA, 1.FUT)
- Is to prepare our society from an early age to know how to value the environment's natural resources and the importance of preserving the environment without a lot of contamination. (21G) (1.NR) (1.VAL, 1.P/C, 1.ISS)
- Environmental education is to teach our children or the community where we work to keep our environment free of garbage and to take care of cleaning our surroundings, planting trees, protecting our natural resources. (25E) (1.NR) (1.ISS, 1.P/C)
- Educate about the conservation of the natural or artificial resources in a way that they can last longer, and benefit humans while [the natural resources] last. (31E) (1.NR) (1.P/C, 1.UTIL)
- To educate for the care and protection of the environment and all the resources that are part of the environment. (33B) (1.NR) (1.P/C, 1.TOT)
- Teachings about the knowledge of our environment and the conservation and preservation of our natural resources, and its limited use and protection. (36B) (1.NR) (1.KNOW, 1.UTIL, 1.P/C)

- It is education that should be taught from infancy to prepare the individual because through this knowledge, they learn the importance of caring about and protecting the environment and thus avoid progressive deterioration and its grave consequences and learn to conserve resources. (42E) (1.NR) (1.A/S, 1.KNOW, 1.P/C)
- It's the conservation of natural resources and the environment in all areas. (46B) (1.NR) (1.TOT)
- It is the way to introduce environmental conservation to the society; to conserve our natural resources—looking for and applying ways to not contaminate them. (50F) (1.NR) (1.P/C, 1.ISS)
- It is the realization that we should all have to know how to rationally utilize natural resources. (56E) (1.NR) (1.KNOW, 1.UTIL)
- It is the rational treatment of our natural resources, the appreciation that we can give to that which surrounds us. (58E) (1.NR) (1.A/S)
- Environmental education is all that is related to our environment. At the same time, teaching that we receive natural resources from that which surrounds us. (79J) (1.NR) (1.TOT, 1.UTIL)

1.P/C = preservation/conservation component

44/83 = 53%

- Is to instruct about the necessity of protecting the animals, and ways to protect and conserve the environment. (2E) (1.P/C) (XX)
- Environmental education: It is the care, protection, and conservation of all the natural riches (treasures) that the environment possesses. (3C) (1.P/C) (1.NR)
- Environmental education consists of educating students (children, adolescents, and adults) in favor of conserving and the maintaining the environment and not destroying it. (6C) (1.P/C)
- Environmental education is taking care of the earth and soil, and the natural resources that exist in our environment, to keep our climate nice. (7C) (1.P/C) (1.NR, 1.ISS)
- Is a useful process for the individual and the education of the individual to make our environment better and, in that way, to avoid the bad environment in our country. (9A) (1.P/C) (XX)
- Is a study that teaches us how to determine strategies to take advantage of and care of the environment. (10A) (1.P/C) (1.UTIL)

- Is the creation of activities that function to protect the environment, when the necessity of taking care to preserve our resources is explained. (12A) (1.P/C) (1.NR)
- It is teaching to conserve an agreeable environment for the development and living of human beings around the world. (14D) (1.P/C) (XX)
- To teach to love everything that surrounds us—water, air, fields, rivers, flora and fauna—and conserve them. (15D) (1.P/C) (1.TOT)
- There are a group of guidelines and principles that we teach the population with the objective of preserving the environment in the proper condition to keep a high level of hygiene, aesthetics, and all that is around us. (16D) (1.P/C) (1.HYG, 1.AES, 1.TOT)
- To teach to take care of the environment through the principles and rules that we have to take into account. (20G) (1.P/C) (1.LAW)
- Is to prepare our society from an early age to know how to value the environment's natural resources and the importance of preserving the environment without a lot of contamination. (21G) (1.PC) (1.NR, 1.VAL, 1.ISS)
- Environmental education is to teach our children or the community where we work to keep our environment free of garbage and to take care of cleaning our surroundings, planting trees, protecting our natural resources. (25E) (1.P/C) (1.ISS, 1.NR)
- It's a program for the protection and improvement of the environment where we live. (27E) (1.P/C) (XX)
- To teach and to learn to take care of the environment in which we live. (29E) (1.P/C) (XX)
- To teach to develop and to educate the children, the young people to take care of the environment that surrounds us and to learn to value the natural, social and cultural resources. (30E) (1.P/C) (1.VAL)
- Educate about the conservation of the natural or artificial resources in a way that they can last longer, and benefit humans while [the natural resources] last. (31E) (1.P/C) (1.NR, 1.UTIL)
- Environmental education is to maintain and constantly care for our environment, in the school and also in the community, teaching the population about its maintenance and improvement. (32B) (1.P/C) (1.LOC)
- To educate for the care and protection of the environment and all the resources that are part of the environment. (33B) (1.P/C) (1.NR, 1.TOT)
- To teach to take care of the environment and its utilization and destruction if we don't take care of it. (34B) (1.P/C) (1.UTIL, 1.VAL)

- Environmental education is all related to the formation and care of the environment and nature. (35B) (1.P/C) (XX)
- Teachings about the knowledge of our environment and the conservation and preservation of our natural resources, and its limited use and protection. (36B) (1.P/C) (1.KNOW, 1.UTIL, 1.NR)
- To teach the way to protect and preserve our environment. (37E) (1.P/C) (XX)
- It is a way to determine interrelations between humans and nature, actions which generate the protection of some and benefit man. (39E) (1.P/C) (1.INTER, 1.UTIL)
- Actions to protect the environment and make it useful to society. (40E) (1.P/C) (1.UTIL)
- It is education that should be taught from infancy to prepare the individual because through this knowledge, they learn the importance of caring about and protecting the environment and thus avoid progressive deterioration and its grave consequences and learn to conserve resources. (42E) (1.P/C) (1.A/S, 1.KNOW, 1.NR)
- Develop in children a love of the environment so they recognize its importance for living beings and awaken an interest in conservation. (43E) (1.P/C) (1.A/S)
- It is ecological conservation in conjunction with, above all, the care that we should have for nature. (47B) (1.P/C) (1.A/S)
- It is understood to be environmental education in a rigorous line that should preserve our natural environment. It is the discipline, laws that obligate the community of care for their environment. (49F) (1.P/C) (1.LAW, 1.LOC)
- It is the way to introduce environmental conservation to the society; to conserve our natural resources—looking for and applying ways to not contaminate them. (50F) (1.P/C) (1.NR, 1.ISS)
- It is a formative process that contributes to the betterment of human actions in conservation and preservation of the environment. This process contributes to the formation of habits, attitudes and aptitudes and, most importantly, the realization that we are part of the land and that without her we cannot live, but yes, she can live without us. (51F) (1.P/C) (1.ATT, 1.A/S, 1.ACT, 1.KNOW, 1.INTER)
- To have environmental knowledge and education is knowing how to protect and help maintain a healthy environment where we live. (52H) (1.P/C) (1.KNOW, 1.HEA, 1.LOC)
- It is the knowledge that it acquired for the preservation of all that is around us. (55E) (1.P/C) (1.KNOW)

- It is all that refers to the environment, how we should protect and study it. (59E) (1.P/C) (1.TOT, 1.KNOW)
- Environmental education to me is all that surrounds us, all of nature; and it is through education, sensitivity of all people, that we can conserve the environment. (61E) (1.P/C) (1.TOT, 1.A/S)
- It is the care and protection of our environment; in other words our forests, rivers, and, in the end, nature. (62E) (1.P/C) (1.TOT)
- Environmental education is the knowledge that each of us has about the environment, plus what we as educators transmit to our students, for its preservation and conservation. (64E) (1.P/C) (1.KNOW)
- It is the care of our environment and how we can conserve it. (68E) (1.P/C) (XX)
- My environmental education is to direct and maintain cleanliness of all that which surrounds us—direct how we should protect the plants, forests and maintain cleanliness in our homes and schools. (69A) (1.P/C) (1.CLE)
- Environmental education is the responsibility of all humans to care for and protect the environment. (74I) (1.P/C) (1.RESP)
- Environmental Education: To know and put into practice priorities that protect, that underline . . . to the well-being and preservation of nature, health, and hygiene. (75I) (1.P/C) (1.HEA, 1.HYG)
- Environmental education is understood as the protection and wise use of nature, the environment in which we live. (76I) (1.P/C) (1.UTIL)
- It is the teaching that brings people closer to the environment that surrounds us and teaches how to care for it so we have a better world. (80J) (1.P/C) (1.A/S, 1.TOT)
- It is the teaching that all humans have about how to conserve and care for plants, animals, and so on. (83B) (1.P/C) (XX)

1.RESP = responsibility component

2/83 = 2%

- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.RESP) (1.UTIL, 1.NR, 1.HYG, 1.HEA, 1.FUT)

- Environmental education is the responsibility of all humans, to care for and protect the environment. (74I) (1.RESP) (1.P/C)

1.TOT = totalitarian view, encompasses everything

13/83 = 16%

- To teach to love everything that surrounds us—water, air, fields, rivers, flora and fauna—and conserve them. (15D) (1.TOT) (1.P/C)
- There are a group of guidelines and principles that we teach the population with the objective of preserving the environment in the proper condition to keep a high level of hygiene, aesthetics, and all that is around us. (16D) (1.TOT) (1.P/C, 1.HYG, 1.AES)
- To educate for the care and protection of the environment and all the resources that are part of the environment. (33B) (1.TOT) (1.P/C, 1.NR)
- It is all that refers to the environment. (44E) (1.TOT) (XX)
- It's the conservation of natural resources and the environment in all areas. (46B) (1.TOT) (1.NR)
- It is the study of all that relates to the environment that surrounds us. (57E) (1.TOT) (1.KNOW)
- It is all that refers to the environment, how we should protect and study it. (59E) (1.TOT) (1.P/C, 1.KNOW)
- It is understood that environmental education is all of nature in general, in which certain aspects: natural areas, rivers, museums, ecological sites, etc. (60E) (1.TOT) (XX)
- Environmental education to me is all that surrounds us, all of nature; and it is through education, sensitivity of all people, that we can conserve the environment. (61E) (1.TOT) (1.P/C, 1.A/S)
- It is the care and protection of our environment; in other words our forests, rivers, and, in the end, nature. (62E) (1.TOT) (1.P/C)
- The environment is everything that surrounds us, including things and people. (66E) (1.TOT)
- Environmental education is all that is related to our environment. At the same time, teaching that we receive natural resources from that which surrounds us. (79J) (1.TOT) (1.NR, 1.UTIL)
- It is the teaching that brings people closer to the environment that surrounds us and teaches how to care for it so we have a better world. (80J) (1.TOT) (1.A/S, 1.P/C)

1.UTIL = utilitarian attitude toward the environment

16/83 = 19%

- Is a study that teaches us how to determine strategies to take advantage of and care of the environment. (10A) (1.UTIL) (P/C)
- Is an attitude of responsibility that we must have as the citizens of a community to make use of the natural resources on the national level and organize the way to preserve an environmental hygiene and to leave a healthy society and natural resources to the new generations. (18D) (1.UTIL) (1.RESP, 1.NR, 1.HYG, 1.HEA, 1.FUT)
- Our knowledge that we teach to maintain the environment, or what remains of the environment, and improve it for the well-being of human beings. (22G) (1.UTIL) (1.KNOW)
- It is teaching children and adults about the environment—its importance and utilization. (23G) (1.UTIL) (1.KNOW)
- Educate about the conservation of the natural or artificial resources in a way that they can last longer, and benefit humans while [the natural resources] last. (31E) (1.UTIL) (1.P/C, 1.NR)
- To teach to take care of the environment and its utilization and destruction if we don't take care of it. (34B) (1.UTIL) (1.P/C, 1.VAL)
- Teachings about the knowledge of our environment and the conservation and preservation of our natural resources, and its limited use and protection. (36B) (1.UTIL) (1.KNOW, 1.P/C, 1.NR)
- It is a way to determine interrelations between humans and nature, actions which generate the protection of some and benefit man. (39E) (1.UTIL) (1.INTER, 1.P/C)
- Actions to protect the environment and make it useful to society. (40E) (1.UTIL) (1.P/C)
- It is the rule for the good survival of all human beings—coexistence with a good environment wherein humans gain the riches from the aforementioned. (45E) (1.UTIL) (XX)
- To make people of all ages conscious about our environment and how it is necessary and useful for our lives. (48E) (1.UTIL) (1.A/S)
- It is the realization that we should all have to know how to rationally utilize natural resources. (56E) (1.UTIL) (1.KNOW, 1.NR)
- To have knowledge of all the benefits the environment offers and all that it encompasses. Also to be conscious of its grand importance and the urgency for preserving it. (67E) (1.UTIL) (1.KNOW)

- Environmental education is understood as the protection and wise use of nature, the environment in which we live. (76I) (1.UTIL) (1.P/C)
- Environmental education is all that is related to our environment. At the same time, teaching that we receive natural resources from that which surrounds us. (79J) (1.UTIL) (1.TOT, 1.NR)
- To offer orientation about the importance of our environment and nature for our survival. (81J) (1.UTIL) (XX)

2. Do you think it's important to teach about the environment? Please explain why or why not.

2.A/S = awareness of and sensitivity to nature and the environment

5/79 = 6%

- It is of great importance because this way we raise consciousness about the conservation of [the environment] as an important part of the preservation of life. (3C) (2.A/S) (2.INTER)
- It is important to teach about the environment so the kids in lower grades learn to care for nature and, when they reach adolescence and adulthood, they can help to protect it and not make it difficult. (37E) (2.A/S) (2.P/C)
- Because it is part of human life, their interrelationships and the way to conserve it. (57E) (2.A/S) (XX)
- Because the society will become conscious of a love of nature. (58E) (2.A/S) (XX)
- Because it is necessary that the citizens sensitize themselves to and understand the importance of knowing and applying their knowledge about environmental education. (75I) (2.A/S) (2.ACT, 2.KNOW)

2.ACT = action component

4/79 = 5%

- Of course, because it is important for the health and, number two, it is important to teach kids right and wrong what they should do for a better environment. (9A) (2.ACT) (2.HEA)
- Yes. Because, through it you can put into practice our knowledge. (66E) (2.ACT) (2.KNOW)

- Yes. Because the student knows and protects everything that their place [town, village] produces and possesses. They involve themselves in protecting [the local environment]. (70A) (2.ACT) (2.LOC, 2.P/C)
- Because it is necessary that the citizens sensitize themselves to and understand the importance of knowing and applying their knowledge about environmental education. (75I) (2.ACT) (2.A/S, 2.KNOW)

2.AES = aesthetic component

3/79 = 4%

- Because everybody has to know that it's important to keep a stable environment, because our health, our nutrition, and the beauty of our country depends on it. (23G) (2.AES) (2.HEA)
- To have beautiful nature that surrounds us. Also to preserve the health. (30E) (2.AES) (2.HEA)
- It is important because in our days, it is not only beautiful to know but important to make a [illegible word] to the knowledge of the natural environment. (49F) (2.AES) (2.KNOW)

2.A/V = affects/forms people's attitudes and values toward environment

7/79 = 9%

- Because we have to teach a new generation from an early age environmental values, that they benefit everybody—all the aspects from degradation to aesthetic values, etc. (21G) (2.A/V) (2.UTIL, 2.ISS)
- Because if we don't know the importance of this, we're not conscious of how to take care of it or renew it. (29E) (2.A/V) (P/C)
- Yes, it is important because we are shaping the values about the environment. (34B) (2.A/V) (XX)
- Yes, because it is necessary that everyone understands the importance of the environment so, in that way, we can value and take better care of it. (35B) (2.A/V) (2.P/C)
- Through this study, kids acquire knowledge and value the importance of it for society, and future generations. (40E) (2.A/V) (2.KNOW, 2.FUT)
- The population must value and protect our environment, that which is indispensable for all living things. (62E) (2.A/V) (2.P/C, 2.INTER)

- It is extremely important that the child is given or creates [his/her own] knowledge and is taught values. (81J) (2.A/V) (2.KNOW)

2.CLE = focused on cleanliness

3/79 = 4%

- To teach about environmental education, we are forming in our students an open mind about the preservation and the use of the environment, giving the guidelines to keep our home, the environment, clean. (16D) (2.CLE) (2.P/C, 2.UTIL)
- It is important because health depends on the hygiene methods that are observed in the home, the neighborhood, and the community. (53H) (2.CLE) (2.HEA, 2.HYG)
- Yes. It is important now that I help the students, teachers and parents work on maintaining cleanliness in our city, schools, and houses to have better health and a better future for the country. (69A) (2.CLE) (2.HEA, 2.FUT)

2.FUT = preserves/protects environment for future generations

14/79 = 18%

- It is very important because we are not going to leave a habitable world for future generations—our children and our grandchildren. (5C) (2.FUT) (XX)
- It is important because in educating and teaching about the environment, we are thinking in the future for the generations that are coming—this way the students will have another way, besides photographs, that they can learn about the treasures of nature. (6C) (2.FUT) (XX)
- Because it is indispensable for guaranteeing the life of the new generations. (19G) (2.FUT) (XX)
- Yes, our future habitants and habitants right now need to be conscious; what the environment is and how it provides perfect, healthy conditions. (28E) (2.FUT) (2.UTIL)
- It is very important because we have to make sure that the future of the new generations where they themselves will be responsible for our environment. (32B) (2.FUT) (XX)
- Through this study, kids acquire knowledge and value the importance of it for society, and future generations. (40E) (2.FUT) (2.KNOW, 2.A/V)
- If we don't care for the environment, we are doing away with the best possibility of maintaining the best conditions of life for future generations. (42E) (2.FUT) (XX)

- So that future generations can create and develop themselves, and that the planetary system doesn't disappear so that the [illegible word] maintain themselves. (47B) (2.FUT) (2.P/C)
- Yes. It is very important because the future depends on what we teach. (64E) (2.FUT) (XX)
- Yes. Because the future of our country depends on it. (68E) (2.FUT) (XX)
- Yes. It is important now that I help the students, teachers and parents work on maintaining cleanliness in our city, schools, and houses to have better health and a better future for the country. (69A) (2.FUT) (2.CLE, 2.HEA)
- Environmental education is important because without it society would contaminate, the future generations would be born with a mentality of destruction and not protection of the environment. (73A) (2.FUT) (2.P/C)
- So that the future generations inherit a better world. (77I) (2.FUT) (XX)
- Yes because the children have to know how to protect our environment for a future that have better life opportunities. (79J) (2.FUT) (2.P/C)

2.GOV = governmental component

1/79 = 1%

- In Nicaragua, it is necessary that young people know about the environment and that they preserve the environment in which we live. The government should be responsible—they shouldn't cut the trees in the mountains and near the rivers and seas without thinking. (15D) (2.GOV) (2.P/C, 2.ISS)

2.HEA = focused on human health issues

9/79 = 11%

- This program [environmental education] will help to avoid diseases that will occur if we don't take care of the environment. (2E) (2.HEA) (XX)
- Of course, because it is important for the health and, number two, it is important to teach kids right and wrong what they should do for a better environment. (9A) (2.HEA) (2.ACT)
- Yes, because it teaches the importance of conserving our environment for every living thing—about everything including health, food, etc. (14D) (2.HEA) (2.P/C, 2.INTER)
- Because everybody has to know that it's important to keep a stable environment, because our health, our nutrition, and the beauty of our country depends on it. (23G) (2.HEA) (2.AES)
- Yes, because this way we are avoiding becoming sick. (26E) (2.HEA) (XX)

- To have beautiful nature that surrounds us. Also to preserve the health. (30E) (2.HEA) (2.AES)
- To help have knowledge about the environment and how to maintain its health, and how to protect us from contaminants. (52H) (2.HEA) (2.P/C, 2.ISS)
- It is important because health depends on the hygiene methods that are observed in the home, the neighborhood, and the community. (53H) (2.HEA) (2.HYG, 2.CLE)
- Yes. It is important now that I help the students, teachers, and parents work on maintaining cleanliness in our city, schools, and houses to have better health and a better future for the country. (69A) (2.HEA) (2.CLE, 2.FUT)

2.HYG = hygienic reasons

2/79 = 2.5%

- It is important because health depends on the hygiene methods that are observed in the home, the neighborhood, and the community. (53H) (2.HYG) (2.HEA, 2.CLE)
- To create a better sanitary environment for the students. (71A) (2.HYG) (XX)

2.INTER = recognition of the interrelationships between humans and the environment/nature

14/79 = 18%

- It is of great importance because this way we raise consciousness about the conservation of [the environment] as an important part of the preservation of life. (3C) (2.INTER) (2.A/S)
- Yes, it is important. Here we have an interrelationship between humans and the environment because they cannot exist separately without both elements. (4C) (2.INTER) (XX)
- In our country there is a lot of ignorance about the great importance of the environment and it is necessary for us to learn how the health or contamination of the environment will affect us. (12A) (2.INTER) (XX)
- Yes, because it teaches the importance of conserving our environment for every living thing—about everything including health, food, etc. (14D) (2.INTER) (2.P/C, 2.HEA)
- Because with that we are teaching all of the people the importance of the environment and what we need to live. (17D) (2.INTER) (2.TOT)
- Because we, the living creatures, depend on the environment. Everybody needs to know the importance it has for us. (22G) (2.INTER) (XX)

- It would be very sad if our society had never talked about the environment in a general way and about all the influences every one of us has on it—giving or receiving. (24G) (2.INTER) (XX)
- It is important because we are working every day toward the destruction of our planet and, with that, the life of human beings and living creatures and the threat is very important—to give knowledge of the environment and be conscious of its importance to life, and to initiate our own defense. (36B) (2.INTER) (2.KNOW)
- To be conscious of the importance of protecting our environment to guarantee life to all. (38E) (2.INTER) (2.P/C)
- Environmental education is important because it gives us a wider understanding of life, awakening universal comprehension. (39E) (2.INTER) (XX)
- Because most people don't know specifically this relationship with the environment and its importance. (41E) (2.INTER) (XX)
- Yes, because the more people that have knowledge about what the environment is, the more we prolong our life and the lives of all other living things. (51F) (2.INTER) (2.KNOW)
- The population must value and protect our environment, that which is indispensable for all living things. (62E) (2.INTER) (2.VAL, 2.P/C)
- Yes it is important because it makes us realize [or recognize] that, for us to exist, our environment must be protected. (76I) (2.INTER) (2.P/C)

2.ISS = focused on certain environmental issues

8/79 = 10%

- It is important because through this class we explain the way to take care of the environment and to avoid the changes that harm nature, like the cutting of trees will reduce the rainfall. (7C) (2.ISS) (2.P/C)
- For the conservation of the forests—in Nicaragua, people destroy them indiscriminately. (10A) (2.ISS) (XX)
- In Nicaragua, it is necessary that young people know about the environment and that they preserve the environment in which we live. The government should be responsible—they shouldn't cut the trees in the mountains and near the rivers and seas without thinking. (15D) (2.ISS) (2.P/C, 2.GOV)

- Yes, it is urgent to educate and teach about the environment because through the history of humanity in the different countries, natural resources have not been used well and every day humans destroy the environment with garbage and smoke and toxins. (18D) (2.ISS) (2.NR)
- Because we have to teach a new generation from an early age environmental values, that they benefit everybody—all the aspects from degradation to aesthetic values, etc. (21G) (2.ISS) (2.VAL, 2.UTIL)
- Yes, because in this way we are conscious of its care—the preoccupation and the bad habits—throwing garbage in its place, etc. (33B) (2.ISS) (2.P/C)
- Yes. It is important because only through environmental education can we conserve nature and avoid the cutting of the forests and the contamination of the atmosphere, rivers, oceans, etc. (50F) (2.ISS) (2.P/C)
- To help have knowledge about the environment and how to maintain its health, and how to protect us from contaminants. (52H) (2.ISS) (2.P/C, 2.HEA)

2.KNOW = focus on environmental knowledge

11/79 = 14%

- It is important because we are working every day toward the destruction of our planet and, with that, the life of human beings and living creatures and the threat is very important—to give knowledge of the environment and be conscious of its importance to life, and to initiate our own defense. (36B) (2.KNOW) (2.INTER)
- Through this study, kids acquire knowledge and value the importance of it for society, and future generations. (40E) (2.KNOW) (2.A/V, 2.FUT)
- This teaching is vital for the understanding of the environment. (45E) (2.KNOW) (XX)
- It is important because in our days, it is not only beautiful to know but important to make a [illegible word] to the knowledge of the natural environment. (49F) (2.KNOW) (2.AES)
- Yes, because the more people that have knowledge about what the environment is, the more we prolong our life and the lives of all other living things. (51F) (2.KNOW) (2.INTER)
- Because knowledge is acquired about the importance of it [the environment]. (56E) (2.KNOW) (XX)
- Because the children should know and not only the children but all persons should know about all that refers to the environment, all that which surrounds us. (59E) (2.KNOW) (2.TOT)

- It is always important to know something new and, above all, to help contribute to conserving our environment. (65E) (2.KNOW) (2.P/C)
- Yes. Because, through it you can put into practice our knowledge. (66E) (2.KNOW) (2.ACT)
- Because it is necessary that the citizens sensitize themselves to and understand the importance of knowing and applying their knowledge about environmental education. (75I) (2.KNOW) (2.A/S, 2.ACT)
- It is extremely important that the child is given or creates [his/her own] knowledge and is taught values. (81J) (2.KNOW) (2.A/V)

2.LAW = legal component

2.LOC = relating to the local environment

1/79 = 1%

- Yes. Because the student knows and protects everything that their place [town, village] produces and possesses. They involve themselves in protecting [the local environment]. (70A) (2.LOC) (2.ACT, 2.P/C)

2.NR = natural resources component

3/79 = 4%

- Yes, it is urgent to educate and teach about the environment because through the history of humanity in the different countries, natural resources have not been used well and every day humans destroy the environment with garbage and smoke and toxins. (18D) (2.NR) (2.ISS)
- It is important because it will allow us to continue to use the natural resources in a better way, without damaging what we have. (31E) (2.NR) (2.UTIL, 2.P/C)
- Because we should maintain and not exhaust our natural resources due to their importance. (48E) (2.NR) (XX)

2.P/C = preservation/conservation component

32/79 = 40.5%

- Yes because it's good for everybody to take care of our environment and I feel it is important to teach about it. (1E) (2.P/C) (XX)

- It is important because through this class we explain the way to take care of the environment and to avoid the changes that harm nature, like the cutting of trees will reduce the rainfall. (7C) (2.P/C) (2.ISS)
- It is important to explain simply the importance of protection and conservation of all parts of our environment. (8A) (2.P/C) (2.TOT)
- Because it is necessary that each student knows the importance of protecting the national environment. (11A) (2.P/C) (XX)
- Yes, because it teaches the importance of conserving our environment for every living thing—about everything including health, food, etc. (14D) (2.P/C) (2.INTER, 2.HEA)
- In Nicaragua, it is necessary that young people know about the environment and that they preserve the environment in which we live. The government should be responsible—they shouldn't cut the trees in the mountains and near the rivers and seas without thinking. (15D) (2.P/C) (2.ISS, 2.GOV)
- To teach about environmental education, we are forming in our students an open mind about the preservation and the use of the environment, giving the guidelines to keep our home, the environment, clean. (16D) (2.P/C) (2.UTIL, 2.CLE)
- I feel it is important to teach. I am teaching our children so that they can learn to protect and take care of our environment that is already deteriorated. (25E) (2.P/C) (XX)
- Because each day we are destroying instead of constructing the environment. (27E) (2.P/C) (XX)
- Because if we don't know the importance of this, we're not conscious of how to take care of it or renew it. (29E) (2.P/C) (2.A/V)
- It is important because it will allow us to continue to use the natural resources in a better way, without damaging what we have. (31E) (2.P/C) (2.UTIL, 2.NR)
- Yes, because in this way we are conscious of its care—the preoccupation and the bad habits—throwing garbage in its place, etc. (33B) (2.P/C) (2.ISS)
- Yes, because it is necessary that everyone understands the importance of the environment so, in that way, we can value and take better care of it. (35B) (2.P/C) (2.A/V)
- It is important to teach about the environment so the kids in lower grades learn to care for nature and, when they reach adolescence and adulthood, they can help to protect it and not make it difficult. (37E) (2.P/C) (2.A/S)

- To be conscious of the importance of protecting our environment to guarantee life to all. (38E) (2. P/C) (2.INTER)
- Because it's important that everybody knows of the environment to protect and conserve it. (44E) (2.P/C) (XX)
- So that future generations can create and develop themselves, and that the planetary system doesn't disappear so that the [illegible] maintain themselves. (47B) (2.P/C) (2.FUT)
- Yes. It is important because only through environmental education can we conserve nature and avoid the cutting of the forests and the contamination of the atmosphere, rivers, oceans, etc. (50F) (2.P/C) (2.ISS)
- To help have knowledge about the environment and how to maintain its health, and how to protect us from contaminants. (52H) (2.P/C) (2.HEA, 2.ISS)
- You teach the children to conserve the environment. (54E) (2.P/C) (XX)
- Yes because in this way we preserve our environment. (55E) (2.P/C) (XX)
- Through knowledge of the environment that surrounds us one realizes the necessities and the manner in which one can conserve and should help so that the environment continues to give in many ways. (60E) (2.P/C) (2.UTIL)
- The population must value and protect our environment, that which is indispensable for all living things. (62E) (2.P/C) (2.A/V, 2.INTER)
- It is always important to know something new and, above all, to help contribute to conserving our environment. (65E) (2.P/C) (2.KNOW)
- Yes. It is considered extremely important especially in these times of its worrisome deterioration. (67E) (2.P/C) (XX)
- Yes. Because the student knows and protects everything that their place [town, village] produces and possesses. They involve themselves in protecting [the local environment]. (70A) (2.P/C) (2.ACT, 2.LOC)
- Environmental education is important because without it society would contaminate. The future generations would be born with a mentality of destruction and not protection of the environment. (73A) (2.P/C) (2.FUT)
- It is important because we get to know how we should protect and care for the environment. (74I) (2.P/C) (XX)
- Yes it is important because it makes us realize [or recognize] that, for us to exist, our environment must be protected. (76I) (2.P/C) (2.INTER)

- So that we educate the boys and girls to conserve the environment without contamination and to protect it from that which wants to destroy it. (78I) (2.P/C) (XX)
- Yes because the children have to know how to protect our environment for a future that have better life opportunities. (79J) (2.P/C) (2.FUT)
- Yes. It is very important because we can teach the children from the time they are young to conserve and not to commit as many errors that are causing so much destruction. (83B) (2.P/C) (XX)

2.REL = religious reasons (Nature/the environment is God's creation and we must take care of it.)

1/79 = 1%

- Yes, we are human beings and we have to preserve everything in the environment that is offered to us because God has provided it for our own benefit and if we destroy it, we ourselves will be guilty of our own misery. (20G) (2.REL) (XX)

2.RESP = responsibility component

2.TOT = totalitarian view, refers to "everything that is around us"

4/79 = 5%

- It is important to explain simply the importance of protection and conservation of all parts of our environment. (8A) (2.TOT) (2.P/C)
- Because with that we are teaching all of the people the importance of the environment and what we need to live. (17D) (2.TOT) (2.INTER)
- Because the children should know and not only the children but all persons should know about all that refers to the environment, all that which surrounds us. (59E) (2.TOT) (2.KNOW)
- Because the environment is all that surrounds us, plants, animals, etc. and if we destroy it we will have a destroyed world. (80J) (2.TOT) (XX)

2.UTIL = utilitarian reasons

5/79 = 6%

- To teach about environmental education, we are forming in our students an open mind about the preservation and the use of the environment, giving the guidelines to keep our home, the environment, clean. (16D) (2.UTIL) (2.P/C, 2.CLE)
- Because we have to teach a new generation from an early age environmental values, that they benefit everybody—all the aspects from degradation to aesthetic values, etc. (21G) (2.UTIL) (2.A/V, 2.ISS)
- Yes, our future habitants and habitants right now need to be conscious; what the environment is and how it provides perfect, healthy conditions. (28E) (2.UTIL) (2.FUT)
- It is important because it will allow us to continue to use the natural resources in a better way, without damaging what we have. (31E) (2.UTIL) (2.NR, 2.P/C)
- Through knowledge of the environment that surrounds us one realizes the necessities and the manner in which one can conserve and should help so that the environment continues to give in many ways. (60E) (2.UTIL) (2.P/C)

3. Have you included teaching about the environment in your classes? If you have included it, please describe in what manner.

3.ACT = citizen action component

3.ACT-CLE = action component—cleaning school or community

8/77 = 10%

- Through the study of natural science or laborale orientation, we plant trees, take care of them, and clean some of the dirty places. (12A) (3.ACT-CLE) (3.SCI, 3.LAB, 3.ACT-REF)
- In a practical way teaching the children where to put the garbage, cleaning around the school. In a theoretical way, through the change of the experience and lectures to the children. (21G) (3.ACT-CLE) (3.ACT-SW)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.ACT-CLE) (3.ISS-CLE, 3.HYG; 3.SPE; 3.ACT-REF)

- Orientation about the cleaning of the classroom every day; Value the importance of plants and the care and respect that they deserve; Respect and maintain the gardens and the trees; Reforest and water the plants; Pick up the garbage in their homes and school and put it in its place. (35B) (3.ACT-CLE) (3.ISS-CLE; 3.ACT-REF)
- Yes. Through teaching the students to know the environment, keeping the community clean in coordination with the mayor's office. (50F) (3.ACT-CLE) (XX)
- Through talks, cleaning and action. (56E) (3.ACT-CLE) (3.SPE)
- Yes. We clean the area where our plants are planted. (63E) (3.ACT-CLE) (XX)
- Yes. Cleaning of the school surroundings (trash, raw sewage [aguas negras]); Protection of the trees; Teach about the protection of animals. (70A) (3.ACT-CLE) (3.ISS-DEF, 3.ANI)

ACT-GARDEN = action component—planting a class garden

1/77 = 1%

- The cultivation of plants; To recognize the importance; To plant a garden. (81J) (3.ACT-GARDEN) (XX)

3.ACT-REF = action component—reforestation project

8/77 = 10%

- Through the study of natural science or laborale orientation, we plant trees, take care of them, and clean some of the dirty places. (12A) (3.ACT-REF) (3.SCI, 3.LAB, 3.ACT-CLE)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.ACT-REF) (3.ACT-CLE, 3.HYG; 3.SPE)
- Orientation about the cleaning of the classroom every day; Value the importance of plants and the care and respect that they deserve; Respect and maintain the gardens and the trees; Reforest and water the plants; Pick up the garbage in their homes and school and put it in its place. (35B) (3.ACT-REF) (3.ISS-CLE)
- In the natural class science we emphasize the content that reflects on the care of our environment—besides the problems, activities like the reforestation of trees and plants around the school, visits to the Tropical Museum of Dry Tropical Forests, etc. to gain interest in the environment for the students, compositions dedicated to the conservation of the environment. (36B) (3.ACT-REF) (3.SCI, 3.FIE, 3.WRI)

- In one practical manner, planting trees in the town center and the community. (47B) (3.ACT-REF) (XX)
- In general terms and have planted trees in the school. (48E) (3.ACT-REF) (XX)
- In lectures, I teach the children why its important to plant trees (do the practice) why we should not throw trash in just any place. (52H) (3.ACT-REF) (3.ISS-SW)
- In protecting the plants that we have in the school and replanting to maintain a pleasant environment. (78I) (3.ACT-REF) (XX)

3.ACT-SW = action component—solid waste management project

1/77 = 1%

- In a practical way teaching the children where to put the garbage, cleaning around the school. In a theoretical way, through the change of the experience and lectures to the children. (21G) (3.ACT-SW) (3.CLE)

3.ART = included in art class(es) or as topic of art project

3/77 = 4%

- With drawings, speeches, lectures, reflections into [environmental] practices in the school. (19G) (3.ART) (3.SPE)
- Writing compositions about the importance of [the environment] and how to take care of it. Making or drawing or talking with [the students]. (22G) (3.ART) (3.WRI, 3.DISC)
- In the form of excursions, drawings, investigations, etc. (57E) (3.ART) (3.FIE)

3.ATV = activities

1/77 = 1%

- Explanations, activities, drawings, diagrams, etc. (8A) (3.ATV) (3.SPE)

3.CIV = included in civics or social studies class(es)

8/77 = 10%

- Methods of preserving the environment in classes of civic and social formation (18D) (3.CIV)3.P/C)
- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest.

At the same time, in the civics, we teach children to take care of and make good use of the community. (20G) (3.CIV) (3.SCI, 3.ISS-AIR, 3.SW, 3.DEF, 3.REF)

- Physical health—view of the senses, digestive system, respiratory system; Social studies—to combat alcoholism, drugs, glue sniffing, children in the streets, parasites of the society (24G) (HEA, CIV)
- Included in social and natural science classes. (44E) (3.CIV) (3.SCI)
- Included in the natural sciences, geography, and civics by means of slides and questions. (45E) (3.CIV) (3.SCI, 3.GEO)
- In the natural sciences and formation civica. In not destroying trees. (54E) (3.CIV) (3.SCI, 3.ISS-DEF)
- In explaining to the children in what way they have to keep the classroom clean and in the moral and civic classes because it is where they cover the topics and in one Spanish class. (72A) (3.CIV) (3.MOR, 3.SPA, 3.ISS-CLE)
- In the areas of primitive civilization, natural sciences, in all the areas given to the importance that it has. Learning all that is related to the importance, value, etc. (77I) (3.CIV) (3.SCI)

3.DIS = class discussions on environmental topic

4/77 = 5%

- Writing compositions about the importance of [the environment] and how to take care of it. Making or drawing or talking with [the students]. (22G) (3.DIS) (3.WRI, 3.ART)
- Yes, through conversations with the students in class. (25E) (3.DISC) (XX)
- Yes, talking about the importance of environmental education. (26E) (3.DISC) (XX)
- Yes, I give the examples of campesinos that they cut the trees indiscriminately and they don't bother to reforest the trees that they cut and I told them that for every tree they cut, they should plant a hundred. We can't only think about the present, we have to think about our future. (28E) (3.DISC) (3.ISS-REF, 3.FUT)

FIE = field studies of the local environment

7/77 = 9%

- We study about the environment, visits to the field [countryside] for real-life study and comparisons. (15D) (3.FIE) (XX)

- In the natural class science we emphasize the content that reflects on the care of our environment—besides the problems, activities like the reforestation of trees and plants around the school, visits to the Tropical Museum of Dry Tropical Forests, etc. to gain interest in the environment for the students, compositions dedicated to the conservation of the environment. (36B) (3.FIE) (3.SCI, 3.WRI, 3.ACT-REF)
- In the form of excursions, drawings, investigations, etc. (57E) (3.FIE) (3.ART)
- When we teach the care and protection of the environment, through an excursion, and its importance. (58E) (3.FIE) (3.ISS-P/C)
- Through practical classes, observation, and sensitization. (67E) (3.FIE) (3.A/S)
- Yes, I have included in natural science classes trips outside to observe different plants and their usefulness. (79J) (3.FIE) (XX)
- Yes. For example, doing experiments with both live and dead plants to take note of what the differences are and, many times, handling and observing deteriorating places. (83B) (3.FIE) (3.SCI)

3.GEO = included in geography class(es)

2/77 = 2.5%

- Yes, environment is included in “natural science” classes and geography where we learn about methods and institutions that protect the environment. (38E) (3.GEO) (3.SCI)
- Included in the natural sciences, geography, and civics by means of slides and questions. (45E) (3.GEO) (3.SCI, 3.CIV)

3.HEA = included in health class(es)

1/77 = 1%

- Physical health—view of the senses, digestive system, respiratory system; Social studies—to combat alcoholism, drugs, glue sniffing, children in the streets, parasites of the society (24G) (3.HEA) (3.CIV)

3.INF = infusion or integration into all topics

5/77 = 6%

- Environmental education is included in classes, joining historical facts with natural situations and show how these fit into everyday life. (39E) (3.INF) (XX)

- In the classes that already work with materials which relate to nature. (62E) (3.INF) (XX)
- Yes. With my first grade students I have taught about what causes damage to trees, not to kill small animals. I have explained to them the ruin caused by "Despale", destruction of the fauna and how the environment is contaminated. (64E) (3.INF) (3.ISS-A/S, 3.P/C, 3.DEF)

3.ISS = environmental issues in general

2/77 = 2.5%

- Through the panels and conservatory and round-table where the teachers present important aspects about how even though people have been instructed how to avoid these problems, people don't want to spend the money to help keep the environment healthy. (6C) (3.ISS) (3.SP)
- It is important because through this class we explain the way to take care of the environment and to avoid the changes that harm nature, like the cutting of trees will reduce the rainfall. (7C) (3.ISS) (3.P/C)

3.ISS-A/S = awareness/sensitivity issues

3/77 = 4%

- In a sensible way, concrete to the children, in the first grade we teach them rules of hygiene referring to the garbage, and to love and enjoy nature. We talk about the danger of not taking care of it. (29E) (3.ISS-A/S) (3.ISS-HYG, 3.ISS-SW, 3.ISS-P/C)
- Yes. With my first grade students I have taught about what causes damage to trees, not to kill small animals. I have explained to them the ruin caused by the destruction of the fauna and how the environment is contaminated. (64E) (3.ISS-A/S) (3.INF, 3.ISS-P/C, 3.DEF)
- Through practical classes, observation, and sensitization. (67E) (3.ISS-A/S) (3.FIE)

3.ISS-AIR = air quality issues

1/77 = 1%

- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest. At the same time, in the civics, we teach children to take care of and make good use of the community. (20G) (3.ISS-AIR) (3.SCI, 3.CIV, 3.ISS-SW, 3.ISS-DEF, 3.ISS-REF)

3.ISS-ANI = animal issues

1/77 = 1%

- Yes. Cleaning of the school surroundings (trash, raw sewage [aguas negras]); Protection of the trees; Teach about the protection of animals. (70A) (3.ISS-ANI) (3.ACT-CLE; ISS-DEF)

3.ISS-CLE = cleanliness issues

7/77 = 9%

- Teaching to the students to keep the school clean and the classrooms and the community. (9A) (3.ISS-CLE) (XX)
- Keeping the school clean, putting the garbage in the right place. In their houses and also on the streets, do not throw garbage on the ground. Take care of plants and water sources. (14D) (3.ISS-CLE) (3.ISS-SW, 3.ISS-H20)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.ISS-CLE) (3.HYG; 3.SPE; 3.ACT-REF, 3.ACT-CLE)
- Orientation about the cleaning of the classroom every day; Value the importance of plants and the care and respect that they deserve; Respect and maintain the gardens and the trees; Reforest and water the plants; Pick up the garbage in their homes and school and put it in its place. (35B) (3.ISS-CLE) (3.ACT-REF, 3.ACT-CLE)
- Cleaning everything—from the home to the school; personal hygiene; education in human relations; in the texts; dental education. (60E) (3.ISS-CLE) (3.HYG)
- Yes. Maintenance of the grade: their school as well as personal materials, Instill the habit of maintaining cleanliness with trash cans, [illegible], messages. (69A) (3.ISS-CLE) (XX)
- In explaining to the children in what way they have to keep the classroom clean and in the moral and civic classes because it is where they cover the topics and in one Spanish class. (72A) (3.ISS-CLE) (3.MOR, 3.CIV, 3.SPA)

3.ISS-CLI = climate change issues

1/77 = 1%

- Yes, teaching the students that throwing garbage in the streets blocks the sewers and if they burn the tires they destroy the ozone layer, and that the indiscriminate cutting of trees makes the climate change. (5C) (3.ISS-CLI) (3.ISS-SW, 3.ISS-OZO, 3.ISS-DEF)

3.ISS-DEF = deforestation issues

8/77 = 10%

- Yes, teaching the students that throwing garbage in the streets blocks the sewers and if they burn the tires they destroy the ozone layer, and that the indiscriminate cutting of trees makes the climate change. (5C) (3.ISS-DEF) (3.ISS-SW, 3.ISS-OZO, 3.ISS-CLI)
- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest. At the same time, in civics, we teach children to take care of and make good use of the community. (20G) (3.ISS-DEF) (3.SCI, 3.CIV, 3.ISS-AIR, 3.ISS-SW, 3.ISS-REF)
- Yes. Its a good time to take advantage of the natural resources. (I had a natural sciences class.) I taught the students that you have to protect the forests to have a healthy environment, free from the contamination of toxics, etc. (46B) (3.ISS-DEF) (3.SCI, 3.ISS-TOX)
- In the natural sciences and formation civica. In not destroying trees. (54E) (3.ISS-DEF) (3.SCI, 3.CIV)
- Yes. On topics such as the damage caused by [the cutting of forests], burning and also how to protect [the environment] from that which contaminates the environment, and others. (59E) (3.ISS-DEF) (3.P/C, 3.TOX)
- Yes. With my first grade students I have taught about what causes damage to trees, not to kill small animals. I have explained to them the ruin caused by destruction of the fauna and how the environment is contaminated. (64E) (3.ISS-DEF) (3.INF, 3/ISS-A/S, 3.ISS-P/C)
- Yes. Cleaning of the school surroundings (trash, raw sewage [aguas negras]); Protection of the trees; Teach about the protection of animals. (70A) (3.ISS-DEF) (3.ACT-CLE; 3.ANI)
- Teaching the children to care for and protect the plants and the animals that they should water the plants and not destroy the forests, that if they cut down a tree they should plant three more. (80J) (3.ISS-DEF) 3.ISS-P/C, 3.ISS-REF)

3.ISS-FUT = futures thinking-related issues

2/77 = 2.5%

- Yes, I give the examples of campesinos that they cut the trees indiscriminately and they don't bother to reforest the trees that they cut and I told them that for every tree they cut, they should plant a hundred. We can't only think about the present, we have to think about our future. (28E) (3.ISS-FUT) (3.DISC, 3.ISS-REF)

- In the area of natural science, placing more emphasis on the danger of destroying [the environment] and our negligence about our environment that is beautiful and is the future of life—the hope for the future. (32B) (3.ISS-FUT) (3.SCI, 3.ISS-P/C)

3.ISS-H20 = water quality or contamination issues

1/77 = 1%

- Keeping the school clean, putting the garbage in the right place. In their houses and also on the streets, do not throw garbage on the ground. Take care of plants and water sources. (14D) (3.ISS-H20) (3.ISS-CLE, 3.ISS-SW,)

3.ISS-HYG = hygiene issues

4/77 = 5%

- In a sensible way, concrete to the children, in the first grade we teach them rules of hygiene referring to the garbage, and to love and enjoy nature. We talk about the danger of not taking care of it. (29E) (3.ISS-HYG) (3.ISS-SW, 3.ISS-A/S, 3.ISS-P/C)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.ISS-HYG) (3.ISS-CLE, 3.SPE, 3.ACT-REF, 3.ACT-CLE)
- Instructing the children and families to practice hygienic habits. (53H) (3.ISS-HYG) (XX)
- Cleaning everything—from the home to the school; personal hygiene; education in human relations; in the texts; dental education. (60E) (3.ISS-HYG) (3.ISS-CLE)

3.ISS-OZO = ozone depletion issues

2/77 = 2.5%

- Yes, teaching the students that throwing garbage in the streets blocks the sewers and if they burn the tires they destroy the ozone layer, and that the indiscriminate cutting of trees makes the climate change. (5C) (3.ISS-OZO) (3.ISS-SW, ISS-DEF, ISS-CLI)

3.ISS-P/C = preservation/conservation issues

14/77 = 18%

- Yes, when we approach topics like ecology and evolution, we have a variety of content and activities that includes the preservation of the environment, to avoid the destruction and deterioration. (16D) (3.ISS-PC) (3.SCI)
- Methods of preserving the environment in classes of civic and social formation (18D) (3.ISS-PC) (3.CIV)
- In a sensible way, concrete to the children, in the first grade we teach them rules of hygiene referring to the garbage, and to love and enjoy nature. We talk about the danger of not taking care of it. (29E) (3.ISS-P/C) (3.ISS-HYG, 3.ISS-SW, 3.ISS-A/S)
- In CCNN [natural science], there are certain topics that we cover in 5th and 6th grade that it is necessary that we talk about the preservation of the environment. (30E) (3.ISS-P/C) (3.SCI)
- In the area of natural science, placing more emphasis on the danger of destroying [the environment] and our negligence about our environment that is beautiful and is the future of life—the hope for the future. (32B) (3.ISS-P/C) (3.SCI, 3.ISS-FUT)
- Yes, teaching about the environment has been included in our classes, showing that it is necessary to care for all that surrounds us—plants, animals, air, etc. (37E) (3.ISS-P/C) (XX)
- Environmental education is included, orientating children toward the preservation of animals and plants and the danger of extinction. (40E) (3.ISS-P/C) (XX)
- When we teach the care and protection of the environment, through an excursion, and its importance. (58E) (3.ISS-P/C) (3.FIE)
- Yes. On topics such as the damage caused by [the cutting of forests], burning and also how to protect [the environment] from that which contaminates the environment, and others. (59E) (3.ISS-P/C) (3.ISS-DEF, 3.TOX)
- Yes. With my first grade students I have taught about what causes damage to trees, not to kill small animals. I have explained to them the ruin caused by destruction of the fauna and how the environment is contaminated. (64E) (3.ISS-P/C) (3.INF, 3.ISS-A/S, 3.ISS-DEF)
- In the care and protection of flora and fauna, hydrology, etc. In all the natural science classes. (65E) (3.ISS-P/C) (3.SCI)
- The topic of ecosystems and elements appears and is elaborated on in the natural science classes. Guidelines and a consciousness for protection of the environment are included in it. (73A) (3.ISS-P/C) (3.SCI)

- In my case, I give Spanish class lectures about the care and protection of the environment, explaining ways to protect the environment. (76I) (3.ISS-P/C) (3.SPA)
- Teaching the children to care for and protect the plants and the animals that they should water the plants and not destroy the forests, that if they cut down a tree they should plant three more. (80J) (3.ISS-P/C) (3.ISS-DEF, 3.ISS-REF)

3.ISS-REF = reforestation issues

5/77 = 6%

- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest. At the same time, in civics, we teach children to take care of and make good use of the community. (20G) (3.ISS-REF) (3.SCI, 3.CIV, 3.ISS-AIR, 3.ISS-SW, 3.ISS-DEF)
- Yes, I give the examples of campesinos that they cut the trees indiscriminately and they don't bother to reforest the trees that they cut and I told them that for every tree they cut, they should plant a hundred. We can't only think about the present, we have to think about our future. (28E) (3.ISS-REF) (3.DISC, 3.FUT)
- Planting trees, burning trash, not burning tires, reforesting, etc. (74I) (3.ISS-REF) (3.SW)
- Teaching the children to care for and protect the plants and the animals that they should water the plants and not destroy the forests, that if they cut down a tree they should plant three more. (80J) (3.ISS-REF) (3.ISS-P/C, 3.ISS-DEF)

3.ISS-SW = solid waste issues

6/77 = 8%

- Yes, teaching the students that throwing garbage in the streets blocks the sewers and if they burn the tires they destroy the ozone layer, and that the indiscriminate cutting of trees makes the climate change. (5C) (3.ISS-SW) (3.ISS-OZO, 3.ISS-DEF, 3.ISS-CLI)
- Keeping the school clean, putting the garbage in the right place. In their houses and also on the streets, do not throw garbage on the ground. Take care of plants and water sources. (14D) (3.ISS-SW) (3.ISS-CLE, 3.ISS-H20)
- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest.

At the same time, in the civics, we teach children to take care of and make good use of the community. (20G) (3.ISS-SW) (3.SCI, 3.CIV, 3.ISS-AIR, 3.ISS-DEF, 3.ISS-REF)

- In a sensible way, concrete to the children, in the first grade we teach them rules of hygiene referring to the garbage, and to love and enjoy nature. We talk about the danger of not taking care of it. (29E) (3.ISS-SW) (3.ISS-HYG, 3.ISS-A/S, 3.ISS-P/C)
- In lectures, I teach the children why its important to plant trees (do the practice) why we should not throw trash in just any place. (52H) (3.ISS-SW) (3.ACT-REF)
- Planting trees, burning trash, not burning tires, reforestation, etc. (74I) (3.ISS-SW) (3.ISS-REF)

3.ISS-TOX = toxic waste issues, issues pertaining to toxics in the environment

2/77 = 2.5%

- Yes. It's a good time to take advantage of the natural resources. (I had a natural sciences class.) I taught the students that you have to protect the forests to have a healthy environment, free from the contamination of toxics, etc. (46B) (3.ISS-TOX) (3.SCI, 3.ISS-DEF)
- Yes. On topics such as the damage caused by [the cutting of forests], burning and also how to protect [the environment] from that which contaminates the environment, and others. (59E) (3.ISS-TOX) (3.ISS-DEF, 3.ISS-P/C)

3.LAB = included in orientacion laborale

2 /77 = 2.5%

- Through the study of natural science or laborale orientation, we plant trees, take care of them, and clean some of the dirty places. (12A) (3.LAB) (3.SCI, 3.ACT-REF,3.CLE)
- Yes, classes of the CCNN—types of vegetation, marine currents; Class laborale—forestation and reforestation. (27E) (3.LAB) (3.SCI)

3.MAT = included in math class(es)

1/77 = 1%

- In different classes: Spanish—making sentences, lectures that talk about the care [of the environment]; Mathematics—use material about the environment to learn addition, division, multiplication, and subtraction to recognize the importance of the environment; Science—

constantly we teach subjects about the environment—plants and animals and their lives. (23G)
(3.MAT) (3.SPA, 3.SCI)

3.MOR = included in moral class(es)

2/77 = 2.5%

- It is briefly included in the class on morals. (71A) (3.MOR) (XX)
- In explaining to the children in what way they have to keep the classroom clean and . . . in the moral and civic classes because it is where they cover the topics and in one Spanish class. (72A) (3.MOR) (3.CIV, SPA, ISS-CLE)

3.SCI = included in science class(es)

24/77 = 31%

- With charlas [lectures] in the natural science classes. (2E) (3.SCI) (XX)
- Through the study of natural science or laborale orientation, we plant trees, take care of them, and clean some of the dirty places. (12A) (3.SCI) (3.LAB, 3.ACT-REF,3.CLE)
- Yes, when we approach topics like ecology and evolution, we have a variety of content and activities that includes the preservation of the environment, to avoid the destruction and deterioration. (16D) (3.SCI) (3.ISS-P/C)
- In natural science we teach the children to take care of the water resources, to not contaminate the air, to throw garbage in the right place, to not cut our trees and, if we cut them, to reforest. At the same time, in the civics, we teach children to take care of and make good use of the community. (20G) (3.SCI) (3.CIV, 3.ISS-AIR, 3.SW, 3.DEF, 3.REF)
- In different classes: Spanish—making sentences, lectures that talk about the care [of the environment]; Mathematics—use material about the environment to learn addition, division, multiplication, and subtraction to recognize the importance of the environment; Science—constantly we teach subjects about the environment—plants and animals and their lives. (23G) (3.SCI) (3.SPA, 3.MAT)
- Yes, classes of the CCNN—types of vegetation, marine currents; Class laborale—forestation and reforestation. (27E) (3.SCI) (3.LAB)
- In CCNN, there are certain topics that we cover in 5th and 6th grade that it is necessary that we talk about the preservation of the environment. (30E) (3.SCI) (3.ISS-P/C)
- Yes, in natural science classes. (31E) (3.SCI) (XX)

- In the area of natural science, placing more emphasis on the danger of destroying it and our negligence about our environment that is beautiful and is the future of life—the hope for the future. (32B) (3.SCI) (3.ISS-FUT, 3.P/C)
- In the natural class science we emphasize the content that reflects on the care of our environment—besides the problems, activities like the reforestation of trees and plants around the school, visits to the Tropical Museum of Dry Tropical Forests, etc. to gain interest in the environment for the students, compositions dedicated to the conservation of the environment. (36B) (3.SCI) (3.FIE, 3.WRI, 3.ACT-REF)
- Yes, environment is included in “natural science” classes and geography where we learn about methods and institutions that protect the environment. (38E) (3.SCI) (3.GEO)
- Included in classes of CCNN and EESS, in subjects of contamination of the atmosphere, flora and fauna of continents. (42E) (3.SCI) (XX)
- Included in Spanish classes and CCNN—subjects related to the environment. (43E) (3.SCI) (3.SPA)
- Included in social and natural science classes. (44E) (3.SCI) (3.CIV)
- Included in the natural sciences, geography, and civics by means of slides and questions. (45E) (3.SCI) (3.GEO, 3.CIV)
- Yes. Its a good time to take advantage of the natural resources. (I had a natural sciences class.) I taught the students that you have to protect the forests to have a healthy environment, free from the contamination of toxics, etc. (46B) (3.SCI) (3.ISS-DEF, 3.TOX)
- Yes. I am a biology teacher and the programs include a lot of teaching about the environment. (51F) (3.SCI) (XX)
- In the natural sciences and formation civica. In not destroying trees. (54E) (3.SCI) (3.CIV, 3.ISS-DEF)
- When giving natural science classes that are related to the environment. (55E) (3.SCI) (XX)
- In the care and protection of flora and fauna, hydrology, etc. In all the natural science classes. (65E) (3.SCI) (3.ISS-P/C)
- The topic of ecosystems and elements appears and is elaborated on in the natural science classes. Guidelines and a consciousness for protection of the environment are included in it. (73A) (3.SCI) (3.P/C)
- In the areas of primitive civilization, natural sciences, in all the areas given to the importance that it has. Learning all that is related to the importance, value, etc. (77I) (3.SCI) (CIV)

- Only in the subject of natural science. (82B) (3.SCI) (XX)
- Yes. For example, doing experiments with both live and dead plants to take note of what the differences are and, many times, handling and observing deteriorating places. (83B) (3.SCI) (3.FIE)

3.SPA = included in Spanish class(es)

6/77 = 8%

- In different classes: Spanish—making sentences, lectures that talk about the care [of the environment]; Mathematics—use material about the environment to learn addition, division, multiplication, and subtraction to recognize the importance of the environment; Science—constantly we teach subjects about the environment—plants and animals and their lives. (23G) (3.SPA) (3.MAT, 3.SCI)
- Included informally in Spanish class. Because my students are in first grade, the fundamentals are taught. (41E) (3.SPA) (XX)
- Included in Spanish classes and CCNN—subjects related to the environment. (43E) (3.SPA) (3.SCI)
- Yes. In the contents of the Spanish subject area of second grade, there is a tie to the environment. (61E) (3.SPA) (XX)
- In explaining to the children in what way they have to keep the classroom clean and if "mora" in the moral and civic classes because it is where they cover the topics and in one Spanish class. (72A) (3.SPA) (3.MOR, 3.CIV, 3.ISS-CLE)
- In my case, I give Spanish class lectures about the care and protection of the environment, explaining ways to protect the environment. (76I) (3.SPA) (3.P/C)

3.SPE = presented in a speech to class

7/77 = 9%

- Speeches and workshops (1E) (3.SPE) (3.WRK)
- Through the panels and conservatory and round-table where the teachers present important aspects about how even though people have been instructed how to avoid these problems, people don't want to spend the money to help keep the environment healthy. (6C) (3.SP) (3.ISS)
- Explanations, activities, drawings, diagrams, etc. (8A) (3.SPE) (3.ART, 3.ATV)

- With drawings, speeches, lectures, reflections into [environmental] practices in the school. (19G) (3.SPE) (3.ART)
- Cleaning the school, personal cleaning, respecting the gardens, not cutting flowers because they are nice, planting more trees, some lecturing about the environment, etc. (34B) (3.SPE) (3.ISS-CLE, 3.HYG; 3.ACT-REF, 3.CLE)
- Through talks, cleaning and action. (56E) (3.SPE) (3.ACT-CLE)

3.WRI = included as a topic in writing assignment(s)

3/77 = 4%

- Yes, for example to develop compositions about how to protect our environment, how to preserve it. Also writing little poems about nature and our environment. (4C) (3.WRI) (XX)
- Writing compositions about the importance of [the environment] and how to take care of it. Making or drawing or talking with [the students]. (22G) (3.WRI) (3.ART, 3.DISC)
- In the natural class science we emphasize the content that reflects on the care of our environment—besides the problems, activities like the reforestation of trees and plants around the school, visits to the Tropical Museum of Dry Tropical Forests, etc. to gain interest in the environment for the students, compositions dedicated to the conservation of the environment. (36B) (3.WRI) (3.SCI, 3.FIE, 3.ACT-REF)

3.WRK = presented in workshop

1/77 = 1%

- Speeches and workshops (1E) (3.WRK) (3.SPE)

4. According to your definition, have you had training specifically in environmental education? If you have had it, when and where? Provided by which organization or government agency? Please describe it briefly.

4.FUNCOD = provided by FUNCOD

1/26 = 4%

- In 1991 and 1992, FUNCOD (Fundacion Nicaraguense para la Conservacion y el Desarrollo), Managua Altamira. (6C) (4.FUNCOD) (XX)

4.HEA = provided by a health-related organization (not MINSA)

1/26 = 4%

- Yes. Health Center. (63E) (4.HEA) (XX)

4.MARENA = provided by MARENA

6/26 = 23%

- MARENA, workshops about "clean summer," March 1997. (16D) (4.MARENA) (XX)
- In 1996 by MARENA at Masaya. (40E) (4.MARENA) (XX)
- Yes. MARENA: helping to reforest the countryside at the edge of the Rio Grande in Carazo. (46B) (4.MARENA) (XX)
- Educational talks about how to conserve the environment given by MARENA. (47B) (4.MARENA) (XX)
- Yes. Through the schools that have worked. By coordination of the Environmental and Natural Resources Ministry [MARENA]. (49F) (4.MARENA) (XX)
- MARENA, the mayor's office, and the Peace Corps. (56E) (4.MARENA) (4.MAY, 4.PC)

4.MAY = provided by the mayor's office

2/26 = 8%

- Seminars about the environment in the mayor's office in Jinotepe and Santa Teresa. (24G) (4.MAY) (XX)
- MARENA, the mayor's office and the Peace Corps. (56E) (4.MAY) (4.MARENA, 4.PC)

4.MED = provided by MED

5/26 = 19%

- Yes, in the week of the environment, MED, from June 2 to 6. The day of the environment is June 5. (2E) (4.MED) (XX)
- MED: Through the programs of study. (16D) (4.MED) (XX)
- Yes, in 1995 through MED they talked about the [nature] preserves of our country and the care of our environment, Rio San Juan of our country. (25E) (4.MED) (4.P/C)
- Through the Ministry of Education. (62E) (4.MED) (XX)
- Yes. MED (82B) (4.MED) (XX)

4.NOR = provided in the normal school

2/26 = 8%

- Yes, in the Normale Riccardo Morales Aviles. But I don't know to what organization it belonged because I didn't have the opportunity to participate from the beginning of the activities. (81J) (4.NOR) (XX)
- More or less. More or less because during the completed master's studies they gave us presentations and lectures on the topic. We worked in vegetable gardens, greenhouses, etc. (83B) (4.NOR) (XX)

4.PC = provided by the Peace Corps

4/26 = 15%

- Yes, the Peace Corps people. (15D) (4.PC) (XX)
- Through the Peace Corps and in the development of educational programs. (54E) (4.PC) (XX)
- MARENA, the mayor's office and the Peace Corps. (56E) (4.PC) (4.MARENA, 4.MAY)
- Yes. Peace Corps, Jenn [Jenn Blakeman, Peace Corps volunteer]. (78I) (4.PC) (XX)

4.SELF = self-taught through reading, attending lectures, television

4/26 = 15%

- No, through television. (19G) (4.SELF) (XX)
- Yes, on my part, I like to read, to know, and learn and talk about things with the others. (34B) (4.SELF) (XX)
- No, I haven't but I have read a lot. (35B) (4.SELF) (XX)
- Through text lectures, newspapers, documents. (67E) (4.SELF) (XX)

4.UNIV = university talk or course

2/26 = 8%

- Yes, in the university UNAN a technical speaker in environmental education. (27E) (4.UNIV) (XX)
- Yes. Through classes at the university, such as ecology, botany, flora, etc. (51F) (4.UNIV) (XX)

11. Have you had special training for being a teacher. If so, please describe.

PROVIDER INFORMATION

11.MED = MED

2/56 = 4%

- Training courses to teach classes in any grade in elementary school and organized by MED. (4C) (11.MED) (11.PRI)
- I have received lessons and talks from MED and shown to a degree what is important. (8A) (11.MED) (11.METH)

11.NIPA = Nicaraguan Institute of Public Administration

1/56 = 2%

- A class about teaching given by the Nicaraguan Institute of Public Administration. (30E) (11.NIPA) (XX)

11.NOR = normal school

18/56 = 32%

- I studied to be an elementary school teacher in the Women's Normal School "Blanca Araiz de Sandino" in San Marcos, Carazo 1979 to 1982. (6C) (11.NOR) (XX)
- Yes, in the Normal School of Jinotepe. (15D) (11.NOR) (XX)
- National Normal school for elementary teachers and periodic training in curricular transformation. (21G) (11.NOR) (XX)
- Yes, I study with the normal school where I have an extension of my degree for elementary school. (22G) (11.NOR) (XX)
- Yes, through the Normal school and workshops that we continually receive for our own training. (23G) (11.NOR) (XX)
- Yes, I have received education as an elementary school teacher in the Normal School. I have received special instruction through the workshops for teachers. (25E) (11.NOR) (XX)
- High school and teaching degree from the Normal school. (35B) (11.NOR) (XX)
- I've obtained specific instruction in education in 4th, 5th, 6th years in Normal school. (44E) (11.NOR) (11.PRI, 11.MID)

- Normal, university—UNAN in mat-physical, other—master’s in primary and secondary education, rural community problems and deforestation (courses). (49F) (11.NOR) (11.UNIV)
- Graduated from the normal school Ricardo Morales in Jinotepe. (52H) (11.NOR) (XX)
- Yes. I studied it in the regular courses of the normal school and have my bachelor’s and master’s degrees in primary education. (53H) (11.NOR) (11.PRI)
- Yes. In the normal schools and training workshops. (70A) (11.NOR) (XX)
- Yes. Studies done in the normal school. (71A) (11.NOR) (XX)
- Yes. Studies completed in the normal schools. (72A) (11.NOR) (XX)
- Yes I have had seeing as the normal trains for formation of the new generations. (74I) (11.NOR) (XX)
- Yes. I graduated from the normal. (75I) (11.NOR) (XX)
- Normal, Post-grad—distance learning, studies in educational transformation initiated by the “SIMEN.” (78I) (11.NOR) (11.SIMEN-DIST, 12.SIMEN)

11.SIMEN = SIMEN

1/56 = 2%

- Normal, Post-grad—distance learning. Studies in educational transformation initiated by the “SIMEN.” (78I) (11.SIMEN) (11.NOR)

11.UNIV = university courses

3/56 = 5%

- Courses at the university and classes offered at the high school at the beginning of the school year to prepare classes for . . . in-service training planned into the curriculum. (14D) (11.UNIV) (XX)
- Yes, teaching in middle school in the Catholic university. (17D) (11.UNIV) (11.MID)
- Normal, university—UNAN in mat-physical, other—master’s in primary and secondary education, rural community problems and deforestation (courses). (49F) (11.UNIV) (11.NOR)

DESCRIPTION OF TRAINING

11.CAP = capacitation (training) workshops or classes

1/56 = 2%

- Capacitation workshops. (1E) (11.CAP) (XX)

11.COMP = computer training

1/56 = 2%

- Operator of microcomputers. (80J) (11.COMP) (XX)

11.DIS = discipline training

1/56 = 2%

- Workshops of training for discipline. (10A) (11.DIS) (XX)

11.EDUC = basic educational theories or philosophies

1/56 = 2%

- Yes. Of course, workshops, trainings, meetings in education. (83B) (11.EDUC) (XX)

11.HS = high school training

2/56 = 3.5%

- A diploma from the elementary education and high school diploma. (33B) (11.HS) (11.PRI)
- High school technical education for middle school that I am taking right now—self-esteem. (36B) (11.HS) (11.MID, 11.PSY)

11.LD = learning disabilities training

1/56 = 2%

- I am a Montessori teacher and have experience working with disabled children. (29E) (11.LD) (XX)

11.MAT = training in mathematics

1/56 = 2%

- Teaching the master's in mathematics. (27E) (11.MAT) (XX)

11.METH = teaching methodologies

4/56 = 7%

- Yes, taking teaching classes and seminars of teaching programs. (5C) (11.METH) (XX)
- I have received lessons and talks from MED and shown to a degree what is important. (8A) (11.METH) (11.MED)
- Training in methodologies. (18D) (11.METH) (XX)
- Yes. Trainings and studies about methodologies. (59E) (11.METH) (XX)

11.MID = middle school training

3/56 = 5%

- Yes, teaching in middle school in the Catholic university. (17D) (MID, UNIV)
- High school technical education for middle school that I am taking right now—self-esteem. (36B) (11.MID) (11.HIGH, 11.PSY)
- I've obtained specific instruction in education in 4th, 5th, 6th years in normal school. (44E) (11.MID) (11.PRI, 11.NOR)

11.PRI = primary school training

5/56 = 9%

- Training courses to teach classes in any grade in elementary school and organized by MED. (4C) (11.PRI) (11.MED)
- Studies of elementary education and educational training. (32B) (11.PRI) (XX)
- A diploma from the elementary education and high school diploma. (33B) (11.PRI) (11.HS)
- I've obtained specific instruction in education in 4th, 5th, 6th years in normal school. (44E) (11.PRI) (11.MID, 11.NOR)
- Yes. I studied it in the regular courses of the normal school and have my bachelor's and master's degrees in primary education. (53H) (11.PRI) (11.NOR)

11.PSY = psychology training

1/56 = 2%

- High school technical education for middle school that I am taking right now—self-esteem. (36B) (11.PSY) (11.MID, 11.HIGH)

12. Since you've been teaching, have you had additional instruction? If so, in which subjects or areas of study? Please describe the training.

12.ALL = all areas

1/47 = 2%

- Yes. I have had additional instruction in a general form in all areas. (76I) (12.ALL) (XX)

12.ART = arts

5/47 = 11%

- This year I have MIC that are mini-centers for capacitation, a training every month. They have also given training in math, human relations, learning these problems with children and art. (8A) (12.ART) (12.MAT, 12.MIC, 12.HR, 12.LD)
- Through the workshops, training in the main classes, Spanish, mathematics, physical education and arts. (23G) (12.ART) (12.SPA, 12.MAT, 12.PE)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation (34B) (12.ART) (12.PSY, 12.HR, 12.EDUC, 12.CUR, 12.MIC, 12.HEA, 12.MAT, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.ART) (12.PSY, 12.MAT, 12.MIC, 12.HR, 12.EDUC)
- Yes. Not in materials but one could say that in hobbies (such as dance) I have, because I am a dance teacher of folkloric ballet, modern. Occasionally I prepare a child to write poetry. (83B) (12.ART) (XX)

12.BUS = business training (accounting, secretarial training, program management, etc.)

3/47 = 6%

- Yes. In workshops for individual methods and grade levels and for program management. (48E) (12.BUS) (12.METH)
- Yes. Course in human relations, secretarial techniques (for teaching technical classes), Environmental training, Educational psychology training (Banco Leon). (73A) (12.BUS) (12.HR, 12.ENV, 12.PSY, 12.BAN)
- Yes. Accounting. (79J) (12.BUS) (XX)

12.CC = civil construction

1/47 = 2%

- Librarian, civil construction (15D) (12.CC) (12.LIB)

12.CUR = curricular transformation

5/47 = 11%

- Curricular transformation (20G) (12.CUR) (XX)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation (34B) (12.CUR) (12.PSY, 12.HR, 12.EDUC, 12.MIC, 12.HEA, 12.ART, 12.MAT, 12.REL)
- Yes. Active methodology (curricular transformation 1 and 2). (62E) (12.CUR) (XX)
- Yes. Training workshops in the new curricular transformations. (71A) (12.CUR) (XX)
- Yes. Training workshop with the new transformations. (72A) (12.CUR) (XX)

12.DIST = distance learning

1/47 = 2%

- Only knowledge that has been given to us in normal and the different courses of distance learning from SIMEN. (77I) (12.DIST) (12.SIMEN)

12.ED = educational theories

3/47 = 6%

- Training in human relations and education (32B) (12.ED) (12.HR)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.ED) (12.PSY, 12.HR, 12.CUR, 12.MIC, 12.HEA, 12.ART, 12.MAT, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.ED) (12.PSY, 12.MAT, 12.ART, 12.MIC, 12.HR)

12.ENG = English

1/47 = 2%

- Yes. Training workshop in Spanish, mathematics, short courses in English, course in human relations. (61E) (12.ENG) (12.SPA, 12.MAT, 12.HR)

12.ENV = environmentally-related topic

3/47 = 6%

- Yes. Course in community environmental problems. (49F) (12.ENV) (XX)
- Yes. In a class: Environmental Education, third year of biology. (51F) (12.ENV) (12.UNIV)
- Environmental training, Educational psychology training (Banco Leon). (73A) (12.ENV) (12.BUS, 12.HR, 12.ENV, 12.PSY, 12.BAN)

12.GEO = geography

1/47 = 2%

- Yes, in grammar, history, geography of America, natural science (university level) in classes or courses. This is for my own not for programs through MED. (22G) (12.GEO) (12.SPA, 12.HIST, 12.SCI)

12.HEA = health-related topics

3/47 = 6%

- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation (34B) (12.HEA) (12.PSY, 12.HR, 12.EDUC, 12.CUR, 12.MIC, 12.ART, 12.MAT, 12.REL)
- Yes. IAS method, first aid, human relations. (60E) (12.HEA) (12.METH, 12.HR)
- Values education, studies in fitness curriculum. (78I) (12.HEA) (12.VAL)

HIST = history

1/47 = 2%

- Yes, in grammar, history, geography of America, natural science (university level) in classes or courses. This is for my own not for programs through MED. (22G) (12.HIST) (12.SPA, 12.GEO, 12.SCI)

12.HR = human relations

8/47 = 17%

- This year I have MIC that are mini-centers for capacitation, a training every month. They have also given training in math, human relations, learning these problems with children and art. (8A) (12.HR) (12.MAT, 12.MIC, 12.ART, 12.LD)

- Training in human relations and education. (32B) (12.HR) (12.EDUC)
- Education in human relations for spiritual formation. (33B) (12.HR) (12.REL)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.HR) (12.PSY, 12.EDUC, 12.CUR, 12.MIC, 12.HEA, 12.ART, 12.MAT, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.HR) (12.PSY, 12.MAT, 12.ART, 12.MIC, 12.EDUC)
- Yes. IAS method, first aid, human relations. (60E) (12.HR) (12.METH, 12.HEA)
- Yes. Training workshop in Spanish, mathematics, short courses in English, course in human relations. (61E) (12.HR) (12.SPA, 12.MAT, 12.ENG)
- Yes. Course in human relations, secretarial techniques (for teaching technical classes), Environmental training, Educational psychology training (Banco Leon). (73A) (12.HR) (12.BUS, 12.ENV, 12.PSY, 12.BAN)

12.LAB = orientacion laborale

1/47 = 2%

- CCNN (neurology, chiropractics, nutrition, etc.) Orientation Laborale (environmental reforestation). (27E) (12.LAB) (12.SCI)

12.LD = learning disabilities

2/47 = 4%

- This year I have MIC that are mini-centers for capacitation, a training every month. They have also given training in math, human relations, learning these problems with children and art. (8A) (12.LD) (12.MAT, 12.MIC, 12.HR, 12.ART)
- About the attention deficit. (29E) (12.LD) (XX)

12.LIB = library training

1/47 = 2%

- Librarian, civil construction (15D) (12.LIB) (12.CC)

12.LIN = linguistics training

1/47 = 2%

- Linguistic—teaches through the UNAN in Feb. and July 1996. (6C) (12.LIN) (12.UNIV)

12.MAT = mathematics

13/47 = 28%

- This year I have MIC that are mini-centers for capacitation, a training every month. They have also given training in math, human relations, learning these problems with children and art. (8A) (12.MAT) (12.MIC, 12.HR, 12.ART, 12.LD)
- Spanish and mathematics. (10A) (12.MAT) (12.SPA)
- Training in the area of mathematics in the university of Jinotepe. Workshops like the MIC to facilitate the knowledge of the subjects where there are difficulties. (11A) (12.MAT) (12.MIC)
- Mathematics and psychological aspects. (17D) (12.MAT) (12.PSY)
- Yes, different methodologies in the teaching of reading, writing, and mathematics. (19G) (12.MAT) (12.SPA)
- Through the workshops, training in the main classes—Spanish, mathematics, physical education and arts. (23G) (12.MAT) (12.SPA, 12.ART, 12.PE)
- Through the workshops they have given us or that I have received additional instruction in the subjects of Spanish, mathematics, social studies through the MED. (25E) (12.MAT) (12.SPA, 12.SS)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.MAT) (12.PSY, 12.HR, 12.EDUC, 12.CUR, 12.MIC, 12.HEA, 12.ART, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.MAT) (12.PSY, 12.ART, 12.MIC, 12.HR, 12.EDUC)
- Yes. Training workshop in Spanish, mathematics, short courses in English, course in human relations. (61E) (12.MAT) (12.SPA, 12.ENG, 12.HR)
- Yes. In the areas of mathematics, Spanish, and in preschool classes. (63E) (12.MAT) (12.SPA, 12.PRE)
- Yes. Mathematics through overheads. (66E) (12.MAT)
- Yes. Mathematics, Spanish, natural sciences. (70A) (12.MAT) (12.SPA, 12.SCI)

12.METH = teaching methodologies

6/47 = 13%

- Teaching methodology for all the areas. (12A) (12.METH) (XX)
- Yes. In workshops for individual methods and grade levels and for program management. (48E) (12.METH) (12.BUS)
- Yes. Trainings in the development of new methodologies. (54E) (12.METH) (XX)
- Yes. IAS method, first aid, human relations. (60E) (12.METH) (12.HEA, 12.HR)
- Active methodologies (31E) (12.METH) (XX)
- Yes. Active methodology (curricular transformation 1 and 2). (62E) (12.METH) (12.CUR)

12.MIC = capacity-building training

4/47 = 8.5%

- This year I have MIC that are mini-centers for capacitation, a training every month. They have also given training in math, human relations, learning these problems with children and art. (8A) (12.MIC) (12.MAT, 12.HR, 12.ART, 12.LD)
- Training in the area of mathematics in the university of Jinotepe. Workshops like the MIC to facilitate the knowledge of the subjects where there are difficulties. (11A) (12.MIC) (12.MAT)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.MIC) (12.PSY, 12.HR, 12.ED, 12.CUR, 12.HEA, 12.ART, 12.MAT, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.MIC) (12.PSY, 12.MAT, 12.ART, 12.HR, 12.EDUC)

12.PE = physical education

1/47 = 2%

- Through the workshops, training in the main classes, Spanish, mathematics, physical education, and arts. (23G) (12.PE) (12.SPA, 12.MAT, 12.ART)

12.PRE = preschool training

1/47 = 2%

- Yes. In the areas of mathematics, Spanish, and in preschool classes. (63E) (12.PRE) 12.MAT, 12.SPA)

12.PSY = psychology

5/47 = 11%

- Education, special attention in a new methodology in human constructivist theories. (9A) (12.PSY) (12.MED)
- Mathematics and psychological aspects. (17D) (12.PSY) (12.MAT)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.PSY) (12.HR, 12.EDUC, 12.CUR, 12.MIC, 12.HEA, 12.ART, 12.MAT, 12.REL)
- Psychology, mathematics, arts and computations, MIC. (35B) (12.PSY) (12.MAT, 12.ART, 12.MIC, 12.HR, 12.EDUC)
- Yes. Course in human relations, secretarial techniques (for teaching technical classes), Environmental training, Educational psychology training (Banco Leon). (73A) (12.PSY) (12.BUS, 12.HR, 12.ENV, 12.BAN)

12.REL = religious training

2/47 = 4%

- Education in human relations for spiritual formation. (33B) (12.REL) (12.HR)
- Yes, psychology, human relations, teaching, curriculum, self-esteem, MIC, human rights, health, arts, breast feeding, catechism, computation. (34B) (12.REL) (12.PSY, 12.HR, 12.ED, 12.CUR, 12.MIC, 12.HEA, 12.ART, 12.MAT)

12.SCI = science

4/47 = 8.5%

- In UNAN, chemistry and biology (14D) (12.SCI) (XX)
- Yes, in grammar, history, geography of America, natural science (university level) in classes or courses this is for my own not for programs through MED. (22G) (12.SCI) (12.SPA, 12.HIST, 12.GEO)

- CCNN (neurology, chiropractics, nutrition, etc.) Orientation Laborale (environmental reforestation) (27E) (12.SCI) (12.LAB)
- Yes. Mathematics, Spanish, Natural sciences. (70A) (12.SCI) (12.MAT, SPA)

12.SPA = Spanish

6/47 = 13%

- Spanish and mathematics. (10A) (12.SPA) (12.MAT)
- Through the workshops, training in the main classes—Spanish, mathematics, physical education and arts. (23G) (12.SPA) (12.MAT, 12.ART, 12.PE)
- Through the workshops they have given us or that I have received additional instruction in the subjects of Spanish, mathematics, social studies through the MED. (25E) (12.SPA) (12.MAT, 12.SS)
- Yes. Training workshop in Spanish, mathematics, short courses in English, course in human relations. (61E) (12.SPA) (12.MAT, 12.ENG, 12.HR)
- Yes. In the areas of mathematics, Spanish, and in preschool classes. (63E) (12.SPA) (12.MAT, 12.PRE)
- Yes, different methodologies in the teaching of reading, writing, and mathematics. (19G) (12.SPA) (12.MAT)

12.SS = social studies

1/47 = 2%

- Through the workshops they have given us or that I have received additional instruction in the subjects of Spanish, mathematics, social studies through the MED. (25E) (12.SS) (12.SPA, 12.MAT)

12.VAL = values education

1/47 = 2%

- Values education, studies in fitness curriculum. (78I) (12.VAL) (12.HEA)

Training Providers

12.BAN = Banco Leon

1/47 = 2%

- Environmental training, Educational psychology training (Banco Leon). (73A) (12.BAN) (12.BUS, 12.HR, 12.ENV, 12.PSY, 12.ENV)

12.MARENA

12.MAY = mayor's office

1/47 = 2%

- Seminars of UNICEF, MED, and the mayor's office (24G) (12.MAY) (12.UNICEF, 12.MED)

12.MED = MED

3/47 = 6%

- Education, special attention in a new methodology in human constructivist theories. (9A) (12.MED) (12.PSY)
- Seminars of UNICEF, MED, and the mayor's office (24G) (UNICEF, MED, MAY)
- Trainings through MED (33B) (12.MED) (XX)

12.SIMEN

2/47 = 4%

- Only knowledge that has been given to us in normal and the different courses of distance learning from SIMEN. (77I) (12.SIMEN) (12.DIST)
- Normal, Post-grad—distance learning, studies in educational transformation initiated by the "SIMEN." (78I) (12.SIMEN) (11.SIMEN, 11.NOR)

12.UNESCO = UNESCO

1/47 = 2%

- I have studied with the project from UNESCO. (74I) (12.UNESCO) (XX)

12.UNICEF = UNICEF

1/47 = 2%

- Seminars of UNICEF, MED, and the mayor's office. (24G) (12.UNICEF) (12.MED, 12.MAY)

12.UNIV = university training

2/47 = 4%

- Linguistic—teaches through the UNAN in Feb. & July 1996 (6C) (12.UNIV) (12.LIN)
- Yes. In a class: Environmental Education, third year of biology. (51F) (12.UNIV) (12.ENV)

Appendix M-3
Teacher Survey Quantitative Data Document

**SPSS RESULTS FROM TEACHER SURVEY
QUANTITATIVE QUESTIONS**

11 Sep 98 SPSS for MS WINDOWS Release 6.1

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QUEST02 Impt. to Teach EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	82	98.8	100.0	100.0
	.	1	1.2	Missing	
	Total	83	100.0	100.0	
Mean	1.000	Mode	1.000	Range	.000
Minimum	1.000	Maximum	1.000		

Valid cases 82 Missing cases 1

QUEST03 Have taught EE in class

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	79	95.2	96.3	96.3
No	2	3	3.6	3.7	100.0
	.	1	1.2	Missing	
	Total	83	100.0	100.0	
Mean	1.037	Median	1.000	Mode	1.000
Range	1.000	Minimum	1.000	Maximum	2.000

Valid cases 82 Missing cases 1

QUEST04 Trained in EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	29	34.9	35.8	35.8
No	2	52	62.7	64.2	100.0
	.	2	2.4	Missing	
	Total	83	100.0	100.0	

Mean	1.642	Median	2.000	Mode	2.000
Range	1.000	Minimum	1.000	Maximum	2.000

Valid cases 81 Missing cases 2

Question 5 Totals (Sorted in Descending Order):

Resource Type	Frequency (total of 81)	Percentage
Textbooks	60	74%
Natural Areas	33	41%
Posters	32	37%
Local Parks	30	37%
Folletos (Brochures)	24	30%
Picture Books	19	23%
Revistas (Magazines)	16	20%
Community Members	13	16%
School Forests	10	12%
Museums	6	7%
Other	5	6%
Environmental Experts	3	4%
Filmstrips	1	1%
Video Cassettes	1	1%
University Specialists	1	1%
Audio Cassettes	0	0%
Peliculas (Films)	0	0%
Scientific Models	0	0%

QUEST05B Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Local Parks	2	24	28.9	38.1	38.1
Posters	3	17	20.5	27.0	65.1
School Forests	7	2	2.4	3.2	68.3
Folletos	10	6	7.2	9.5	77.8
Natural Areas	11	9	10.8	14.3	92.1
Revistas	14	2	2.4	3.2	95.2
Community Members	17	3	3.6	4.8	100.0
.	.	20	24.1	Missing	
Total		83	100.0	100.0	
Mean	5.571	Median	3.000	Mode	2.000
Range	15.000	Minimum	2.000	Maximum	17.000

Valid cases 63 Missing cases 20

QUEST05C Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Posters	3	14	16.9	28.0	28.0
Filmstrips	4	1	1.2	2.0	30.0
School Forests	7	6	7.2	12.0	42.0
Folletos	10	5	6.0	10.0	52.0
Natural Areas	11	6	7.2	12.0	64.0
Museums	12	2	2.4	4.0	68.0
Revistas	14	3	3.6	6.0	74.0
Picture Books	16	7	8.4	14.0	88.0
Community Members	17	5	6.0	10.0	98.0
Other	18	1	1.2	2.0	100.0
.	.	33	39.8	Missing	
Total		83	100.0	100.0	
Mean	9.700	Median	10.000	Mode	3.000
Range	15.000	Minimum	3.000	Maximum	18.000

QUEST05A Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Textbooks	1	60	72.3	74.1	74.1
Local Parks	2	6	7.2	7.4	81.5
Posters	3	1	1.2	1.2	82.7
Environmental Expert	9	1	1.2	1.2	84.0
Folletos	10	3	3.6	3.7	87.7
Natural Areas	11	6	7.2	7.4	95.1
Community Members	17	1	1.2	1.2	96.3
None of the Above	19	3	3.6	3.7	100.0
.	.	2	2.4	Missing	
	Total	83	100.0	100.0	
Mean	3.136	Median	1.000	Mode	1.000
Range	18.000	Minimum	1.000	Maximum	19.000
Valid cases	81	Missing cases	2		

Valid cases 50 Missing cases 33

QUEST05D Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Video Cassettes	6	1	1.2	3.2	3.2
School Forests	7	2	2.4	6.5	9.7
Environmental Expert	9	1	1.2	3.2	12.9
Folletos	10	8	9.6	25.8	38.7
Natural Areas	11	5	6.0	16.1	54.8
Revistas	14	6	7.2	19.4	74.2
University Specialis	15	1	1.2	3.2	77.4
Picture Books	16	4	4.8	12.9	90.3
Community Members	17	1	1.2	3.2	93.5
Other	18	2	2.4	6.5	100.0
.	.	52	62.7	Missing	
Total		83	100.0	100.0	

Mean	12.258	Median	11.000	Mode	10.000
Range	12.000	Minimum	6.000	Maximum	18.000

Valid cases 31 Missing cases 52

QUEST05E Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Environmental Expert	9	1	1.2	6.7	6.7
Folletos	10	1	1.2	6.7	13.3
Natural Areas	11	6	7.2	40.0	53.3
Museums	12	1	1.2	6.7	60.0
Picture Books	16	3	3.6	20.0	80.0
Community Members	17	2	2.4	13.3	93.3
Other	18	1	1.2	6.7	100.0
.	.	68	81.9	Missing	
Total		83	100.0	100.0	

Mean	13.133	Median	11.000	Mode	11.000
Range	9.000	Minimum	9.000	Maximum	18.000

Valid cases 15 Missing cases 68

QUEST05F Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Folletos	10	1	1.2	11.1	11.1
Natural Areas	11	1	1.2	11.1	22.2
Museums	12	2	2.4	22.2	44.4
Revistas	14	5	6.0	55.6	100.0
.	.	74	89.2	Missing	
Total		83	100.0	100.0	

Mean	12.778	Median	14.000	Mode	14.000
Range	4.000	Minimum	10.000	Maximum	14.000

Valid cases 9 Missing cases 74

QUEST05G Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Museums	12	1	1.2	20.0	20.0
Picture Books	16	4	4.8	80.0	100.0
.	.	78	94.0	Missing	
Total		83	100.0	100.0	

Mean	15.200	Median	16.000	Mode	16.000
Range	4.000	Minimum	12.000	Maximum	16.000

Valid cases 5 Missing cases 78

QUEST05H Available EE Resources

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Picture Books	16	1	1.2	33.3	33.3
Community Members	17	1	1.2	33.3	66.7
Other	18	1	1.2	33.3	100.0
	.	80	96.4	Missing	
	Total	83	100.0	100.0	

Mean	17.000	Median	17.000	Mode	16.000
Range	2.000	Minimum	16.000	Maximum	18.000

* Multiple modes exist. The smallest value is shown.

Valid cases 3 Missing cases 80

Question 6 Totals (Sorted in Descending Order):

Barrier	Frequency (total of 82)	Percentage
Lack of EE Resources	48	58.5%
Lack of EE Training	42	51%
Lack of Planning Time	12	15%
Lack of Teaching Time	10	12%
Other	10	12%

QUEST06A Barriers to EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Lack of Planning Tim	1	10	12.0	12.2	12.2
Lack of Teaching Tim	2	8	9.6	9.8	22.0

Lack of EE Training	3	33	39.8	40.2	62.2
Lack of EE Resources	4	26	31.3	31.7	93.9
Other	5	5	6.0	6.1	100.0
	.	1	1.2	Missing	

Total	83	100.0	100.0
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Mean	3.098	Median	3.000	Mode	3.000
Range	4.000	Minimum	1.000	Maximum	5.000

Valid cases	82	Missing cases	1
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QUEST06B Barriers to EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Lack of Teaching Tim	2	2	2.4	7.4	7.4
Lack of EE Training	3	7	8.4	25.9	33.3
Lack of EE Resources	4	15	18.1	55.6	88.9
Other	5	3	3.6	11.1	100.0
	.	56	67.5	Missing	
Total		83	100.0	100.0	

Mean	3.704	Median	4.000	Mode	4.000
Range	3.000	Minimum	2.000	Maximum	5.000

Valid cases 27 Missing cases 56

QUEST06C Barriers to EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Lack of EE Training	3	2	2.4	22.2	22.2
Lack of EE Resources	4	5	6.0	55.6	77.8
Other	5	2	2.4	22.2	100.0
	.	74	89.2	Missing	
Total		83	100.0	100.0	

Mean	4.000	Median	4.000	Mode	4.000
Range	2.000	Minimum	3.000	Maximum	5.000

Valid cases 9 Missing cases 74

QUEST06D Barriers to EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Lack of EE Resources	4	2	2.4	100.0	100.0
	.	81	97.6	Missing	
		-----	-----	-----	
	Total	83	100.0	100.0	

Mean	4.000	Mode	4.000	Range	.000
Minimum	4.000	Maximum	4.000		

Valid cases 2 Missing cases 81

Question 7 Totals (Sorted in Descending Order):

Factor to Encourage (total of 82)	Frequency	Percentage
More EE Training	59	72%
More Access to EE Resources	44	54%
EE Time During School	28	34%
After School EE Program	24	29%
More Time for Teaching Required Subjects	5	6%
Other	4	5%
More Planning Time	3	4%

QUEST07A Encouragement for EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
More EE Training	1	59	71.1	72.0	72.0
EE time during schoo	3	12	14.5	14.6	86.6
Access to EE Resourc	4	7	8.4	8.5	95.1

More time for teachi	5	1	1.2	1.2	96.3
After school EE Prog	6	3	3.6	3.7	100.0
.		1	1.2	Missing	
		-----	-----	-----	
Total		83	100.0	100.0	

Mean	1.780	Median	1.000	Mode	1.000
Range	5.000	Minimum	1.000	Maximum	6.000

Valid cases 82 Missing cases 1

QUEST07B Encouragement for EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
More Planning Time	2	3	3.6	4.4	4.4
EE time during schoo	3	15	18.1	22.1	26.5
Access to EE Resourc	4	32	38.6	47.1	73.5
More time for teachi	5	2	2.4	2.9	76.5
After school EE Prog	6	15	18.1	22.1	98.5
Other	7	1	1.2	1.5	100.0
.	.	15	18.1	Missing	
Total		83	100.0	100.0	
Mean	4.206	Median	4.000	Mode	4.000
Range	5.000	Minimum	2.000	Maximum	7.000
Valid cases	68	Missing cases	15		

QUEST07C Encouragement for EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
EE time during schoo	3	1	1.2	8.3	8.3
Access to EE Resourc	4	5	6.0	41.7	50.0
More time for teachi	5	1	1.2	8.3	58.3
After school EE Prog	6	3	3.6	25.0	83.3
Other	7	2	2.4	16.7	100.0
.	.	71	85.5	Missing	
Total		83	100.0	100.0	
Mean	5.000	Median	4.500	Mode	4.000
Range	4.000	Minimum	3.000	Maximum	7.000
Valid cases	12	Missing cases	71		

QUEST07D Encouragement for EE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
More Time for Teachi	5	1	1.2	20.0	20.0
After School EE Prog	6	3	3.6	60.0	80.0
Other	7	1	1.2	20.0	100.0
	.	78	94.0	Missing	
	Total	83	100.0	100.0	
Mean	6.000	Median	6.000	Mode	6.000
Range	2.000	Minimum	5.000	Maximum	7.000

Valid cases 5 Missing cases 78

Question 8 Totals (Sorted in Descending Order):

Enviro. Problem	Frequency (total of 81)	Percentage
Lack of Environmental Sensitivity	49	60%
Deforestation	24	29%
Trash	16	19.5%
Water Contamination	5	6%
Gray Water (Sewage Waters)	4	5%
Other	2	2%
Soil Erosion	1	1%
Pesticide Poisoning	0	0%

QUEST08A Environmental Problems

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
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Trash	1	16	19.3	19.5	19.5
Deforestation	2	18	21.7	22.0	41.5
Lack of Enviro. Sens	3	46	55.4	56.1	97.6
Gray Water	5	1	1.2	1.2	98.8
Water Contamination	6	1	1.2	1.2	100.0
.	.	1	1.2	Missing	

		-----	-----	-----
Total		83	100.0	100.0

Mean	2.451	Median	3.000	Mode	3.000
Range	5.000	Minimum	1.000	Maximum	6.000

Valid cases	82	Missing cases	1
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QUEST08B Environmental Problems

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Deforestation	2	6	7.2	42.9	42.9
Lack of Environmenta	3	2	2.4	14.3	57.1
Soil Erosion	4	1	1.2	7.1	64.3
Gray Water	5	2	2.4	14.3	78.6
Water Contamination	6	1	1.2	7.1	85.7
Other	8	2	2.4	14.3	100.0
.	.	69	83.1	Missing	
Total		83	100.0	100.0	

Mean	3.857	Median	3.000	Mode	2.000
Range	6.000	Minimum	2.000	Maximum	8.000

Valid cases 14 Missing cases 69

QUEST08C Environmental Problems

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Lack of Environmenta	3	1	1.2	20.0	20.0
Gray Waters	5	1	1.2	20.0	40.0
Water Contamination	6	3	3.6	60.0	100.0
.	.	78	94.0	Missing	
Total		83	100.0	100.0	

Mean	5.200	Median	6.000	Mode	6.000
Range	3.000	Minimum	3.000	Maximum	6.000

Valid cases 5 Missing cases 78

QUEST09 Years Teaching

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No Response	0	4	4.8	4.9	4.9
1	1	2	2.4	2.5	7.4
2	2	7	8.4	8.6	16.0
3	3	3	3.6	3.7	19.8
4	4	1	1.2	1.2	21.0
5	5	5	6.0	6.2	27.2
6	6	2	2.4	2.5	29.6
8	8	4	4.8	4.9	34.6
9	9	3	3.6	3.7	38.3
10	10	3	3.6	3.7	42.0
11	11	2	2.4	2.5	44.4
12	12	6	7.2	7.4	51.9
13	13	6	7.2	7.4	59.3
14	14	4	4.8	4.9	64.2
15	15	4	4.8	4.9	69.1
16	16	2	2.4	2.5	71.6
17	17	4	4.8	4.9	76.5
18	18	5	6.0	6.2	82.7
19	19	3	3.6	3.7	86.4
20	20	3	3.6	3.7	90.1
21	21	4	4.8	4.9	95.1
	24	1	1.2	1.2	96.3
30	30	2	2.4	2.5	98.8
32	32	1	1.2	1.2	100.0
	.	2	2.4	Missing	
Total		83	100.0	100.0	

Mean	11.728	Median	12.000	Mode	2.000
Range	32.000	Minimum	.000	Maximum	32.000

Valid cases 81 Missing cases 2

QUEST10 Level of Education

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Primary	1	12	14.5	14.6	14.6
Secondary	2	3	3.6	3.7	18.3
Normal	3	43	51.8	52.4	70.7
University	4	22	26.5	26.8	97.6
Post-Graduate	5	2	2.4	2.4	100.0
.	.	1	1.2	Missing	
Total		83	100.0	100.0	

Mean	2.988	Median	3.000	Mode	3.000
Range	4.000	Minimum	1.000	Maximum	5.000

Valid cases 82 Missing cases 1

QUEST11 Special Teacher Training

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	68	81.9	82.9	82.9
No	2	12	14.5	14.6	97.6
No Response	3	1	1.2	1.2	98.8
	11	1	1.2	1.2	100.0
.	.	1	1.2	Missing	
Total		83	100.0	100.0	

Mean	1.293	Median	1.000	Mode	1.000
Range	10.000	Minimum	1.000	Maximum	11.000

Valid cases 82 Missing cases 1

QUEST12 In-Service Training

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	52	62.7	65.0	65.0
No	2	24	28.9	30.0	95.0
No Answer	3	4	4.8	5.0	100.0
	.	3	3.6	Missing	
Total		83	100.0	100.0	
Mean	1.400	Median	1.000	Mode	1.000
Range	2.000	Minimum	1.000	Maximum	3.000

Valid cases 80 Missing cases 3

QUEST13 In-Service Tng/Year

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
0	0	5	6.0	11.4	11.4
1	1	5	6.0	11.4	22.7
2	2	5	6.0	11.4	34.1
3	3	2	2.4	4.5	38.6
4	4	6	7.2	13.6	52.3
5	5	3	3.6	6.8	59.1
More than 5	6	3	3.6	6.8	65.9
No Response	7	14	16.9	31.8	97.7
other	8	1	1.2	2.3	100.0
	.	39	47.0	Missing	
Total		83	100.0	100.0	
Mean	4.182	Median	4.000	Mode	7.000
Range	8.000	Minimum	.000	Maximum	8.000

Valid cases 44 Missing cases 39

QUEST14A Total # Students

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No Response	0	1	1.2	2.2	2.2
	7	1	1.2	2.2	4.4
10	10	3	3.6	6.7	11.1
12	12	1	1.2	2.2	13.3
13	13	2	2.4	4.4	17.8
14	14	1	1.2	2.2	20.0
	15	3	3.6	6.7	26.7
18	18	1	1.2	2.2	28.9
	20	1	1.2	2.2	31.1
21	21	1	1.2	2.2	33.3
26	26	1	1.2	2.2	35.6
28	28	1	1.2	2.2	37.8
30	30	1	1.2	2.2	40.0
32	32	1	1.2	2.2	42.2
33	33	1	1.2	2.2	44.4
34	34	1	1.2	2.2	46.7
35	35	4	4.8	8.9	55.6
38	38	1	1.2	2.2	57.8
39	39	1	1.2	2.2	60.0
40	40	2	2.4	4.4	64.4
41	41	1	1.2	2.2	66.7
42	42	2	2.4	4.4	71.1
43	43	2	2.4	4.4	75.6
54	54	1	1.2	2.2	77.8
56	56	1	1.2	2.2	80.0
84	84	1	1.2	2.2	82.2
150	150	2	2.4	4.4	86.7
160	160	1	1.2	2.2	88.9
168	168	1	1.2	2.2	91.1
210	210	1	1.2	2.2	93.3
240	240	1	1.2	2.2	95.6
320	320	1	1.2	2.2	97.8
400	400	1	1.2	2.2	100.0
		38	45.8	Missing	
		-----	-----	-----	
	Total	83	100.0	100.0	

Mean	63.911	Median	35.000	Mode	35.000
Range	400.000	Minimum	.000	Maximum	400.000

Valid cases 45 Missing cases 38

QUEST14B # Hours in Class

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
3	3	2	2.4	4.4	4.4
4	4	2	2.4	4.4	8.9
5	5	22	26.5	48.9	57.8
6	6	12	14.5	26.7	84.4
7	7	3	3.6	6.7	91.1
10	10	1	1.2	2.2	93.3
12	12	1	1.2	2.2	95.6
No Response	13	2	2.4	4.4	100.0
	.	38	45.8	Missing	
Total		83	100.0	100.0	

Mean	5.889	Median	5.000	Mode	5.000
Range	10.000	Minimum	3.000	Maximum	13.000

Valid cases 45 Missing cases 38

QUEST15 # Assistants

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
0	0	23	27.7	52.3	52.3
1	1	11	13.3	25.0	77.3
No Response	7	8	9.6	18.2	95.5
Other	8	2	2.4	4.5	100.0
	.	39	47.0	Missing	
Total		83	100.0	100.0	

Mean	1.886	Median	.000	Mode	.000
Range	8.000	Minimum	.000	Maximum	8.000

Valid cases 44 Missing cases 39

QUEST17A Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Science	1	28	33.7	62.2	62.2
Spanish	2	10	12.0	22.2	84.4
Math	5	3	3.6	6.7	91.1
History/Social Studi	6	1	1.2	2.2	93.3
Other	9	1	1.2	2.2	95.6
All	10	1	1.2	2.2	97.8
No Response	11	1	1.2	2.2	100.0
.	.	38	45.8	Missing	
Total		83	100.0	100.0	
Mean	2.200	Median	1.000	Mode	1.000
Range	10.000	Minimum	1.000	Maximum	11.000

Valid cases 45 Missing cases 38

QUEST17B Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Science	2	22	26.5	62.9	62.9
Spanish	3	1	1.2	2.9	65.7
English/Foreign Lang	4	1	1.2	2.9	68.6
EE	5	8	9.6	22.9	91.4
Math	6	2	2.4	5.7	97.1
PE	9	1	1.2	2.9	100.0
.	.	48	57.8	Missing	
Total		83	100.0	100.0	
Mean	3.200	Median	2.000	Mode	2.000
Range	7.000	Minimum	2.000	Maximum	9.000

Valid cases 35 Missing cases 48

QUEST17C Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Spanish	3	1	1.2	3.0	3.0
English/Foreign Lang	4	1	1.2	3.0	6.1
EE	5	21	25.3	63.6	69.7
Math	6	2	2.4	6.1	75.8
History/Social Studi	7	5	6.0	15.2	90.9
Art	8	3	3.6	9.1	100.0
.	.	50	60.2	Missing	
Total		83	100.0	100.0	
Mean	5.545	Median	5.000	Mode	5.000
Range	5.000	Minimum	3.000	Maximum	8.000
Valid cases	33	Missing cases	50		

QUEST17D Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
EE	5	1	1.2	3.1	3.1
Math	6	21	25.3	65.6	68.8
Art	8	8	9.6	25.0	93.8
PE	9	2	2.4	6.3	100.0
.	.	51	61.4	Missing	
Total		83	100.0	100.0	
Mean	6.656	Median	6.000	Mode	6.000
Range	4.000	Minimum	5.000	Maximum	9.000
Valid cases	32	Missing cases	51		

QUEST17E Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Math	6	1	1.2	4.2	4.2
History/Social Studi	7	6	7.2	25.0	29.2
Art	8	14	16.9	58.3	87.5
Phys. Ed.	9	3	3.6	12.5	100.0
.	.	59	71.1	Missing	
Total		83	100.0	100.0	

Mean	7.792	Median	8.000	Mode	8.000
Range	3.000	Minimum	6.000	Maximum	9.000

Valid cases 24 Missing cases 59

QUEST17F Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
History/Social Studi	7	1	1.2	12.5	12.5
Art	8	5	6.0	62.5	75.0
PE	9	1	1.2	12.5	87.5
Other	10	1	1.2	12.5	100.0
.	.	75	90.4	Missing	
Total		83	100.0	100.0	

Mean	8.250	Median	8.000	Mode	8.000
Range	3.000	Minimum	7.000	Maximum	10.000

Valid cases 8 Missing cases 75

QUEST17G Subjects Taught

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
PE	8	1	1.2	50.0	50.0
Other	9	1	1.2	50.0	100.0
	.	81	97.6	Missing	
	Total	83	100.0	100.0	

Mean	8.500	Median	8.500	Mode	8.000
Range	1.000	Minimum	8.000	Maximum	9.000

* Multiple modes exist. The smallest value is shown.

Valid cases 2 Missing cases • 81

**GUIA METODOLOGICA PARA LA DETERMINACION DE
PRIORIDADES PARA EL ACCIONAR AMBIENTAL
en el SERVICIO ECOLOGICO para estudiantes de Secundaria**

A fin de determinar las prioridades ambientales a las que debemos dirigir nuestro esfuerzo con el servicio ecológico en nuestros colegios e institutos, podemos implementar la siguiente metodología, que se estructura en tres partes: **la encuesta, el análisis de la información y la organización del programa de acción.**

A. LA ENCUESTA

Investiga con la comunidad educativa (compañeros de clase, profesores, padres de familia, vecinos, etc.) lo siguiente:

- 1. Los cinco (5) problemas ambientales más sentidos en el área.** Probablemente deberás ser más específico al abordar esta pregunta. Podrías preguntar: Que cosas no andan bien en nuestra comunidad? Cuáles son los problemas más serios que enfrentamos en la comunidad? Podría suceder que los problemas que la gente identifica no parezcan directamente relacionados con problemáticas ambientales, pero habrá que tomarlos en cuenta para luego analizar sus causas y sus efectos. De seguro que el problema señalado tendrá alguna conexión con la problemática ambiental.
- 2. Qué acciones se deberían realizar para resolver los problemas señalados?** Es importante que las acciones que se planteen involucren a la población afectada, y particularmente al entrevistado. Para ello habrá que formular la pregunta de la siguiente manera: Qué haría Ud. para resolver el problema?, o Qué podría hacer Ud.?, o Qué recomendaría que la población hiciese para resolver el problema?. Es necesario personalizar la pregunta de manera que el entrevistado no nos de respuestas tales como : El gobierno debería hacer tal o cual ley, o el Gobierno debería mandar a pavimentar las calles, etc. Este tipo de respuestas no nos sirven de mucho, porque lo que queremos es que la población busque soluciones a sus propios problemas, partiendo de sus propios recursos.
- 3. Con qué recursos contamos para realizar esas acciones?** Es necesario consultar a la población sobre los recursos disponibles. Podría ser que algunos miembros de la comunidad tengan ellos mismos, o al menos cuenten con contactos que le pudiesen facilitar los recursos necesarios para realizar las acciones propuestas.

Con esta encuesta (formato adjunto), los estudiantes tendrán un cúmulo de información que deberán analizar, para determinar cuáles son las acciones que podrían resultar más efectivas en la solución de las problemáticas ambientales más sentidas por la población.

Es necesario determinar el número de personas a entrevistar y la representatividad que de toda la comunidad tienen las personas seleccionadas. Esto es importante para darle validez a la información que se obtenga. Se deberá considerar un número de personas adecuado por estudiante, que puede oscilar entre **10 y 15**. Al seleccionar a las personas, debemos

tratar de tener una buena representación de todos los sectores, grupos sociales, edades, razas, religiones, etc. Nuestro grupo a entrevistar debe ser lo más variado posible, para tener una buena idea de lo que todos consideran como prioridad.

Es importante saber que quizás haya organizaciones no gubernamentales e instituciones del estado que han realizado sus diagnósticos, y tienen una idea más o menos clara de la situación. Esto nos puede servir para respaldar nuestros resultados, pero no le quita importancia al esfuerzo que hacemos con nuestra investigación, pues de ella vamos a aprender mucho.

B. ANALISIS DE LA INFORMACION

Una vez en el aula de clase, los estudiantes se reúnen a analizar la información recopilada por las encuestas. La idea es sintetizar la información, para determinar el sentir generalizado en dos o tres palabras, con relación a la problemática ambiental de la comunidad. Para ello se propone el siguiente procedimiento:

IDENTIFICANDO LA PROBLEMÁTICA:

1. El coordinador del grupo, o el profesor, dirige la actividad. El primer paso es , determinar, a través del procedimiento "lluvia de ideas", las 5 problemáticas más sentidas por la población. para ello, el profesor pide a cada estudiante que vaya exponiendo las problemáticas que él determinó en su encuesta. El profesor deberá ir escribiendo todas y cada una de las problemáticas, y por intuición, ir clasificándolas por afinidad. por ejemplo:

Problemática identificada en tres encuestas:

Problemática reflejada en la encuesta realizada por María	Problemática reflejada en la encuesta realizada por Juan	Problemática reflejada en la encuesta realizada por Margarita
Mucha basura en las calles	Las inundaciones en el pueblo, en la época lluviosa	Muchas enfermedades como la diarrea, la malaria, etc.
Despale	Falta de agua potable	Malos inviernos que no permiten una buena cosecha
Contaminación del río	Despale o deforestación	Calor insoportable

Cada estudiante mencionará la problemática identificada en su encuesta en el orden y en la forma en que la recibió del informante. El profesor deberá tratar de agrupar las problemáticas afines, por ejemplo:

PROBLEMATICAS		
Mucha basura en las calles	Despale	Contaminación del río
Inundaciones en el pueblo en la época de lluvia	Despale o deforestación	Falta de agua potable
	Malos inviernos que no permiten una buena cosecha.	Muchas enfermedades como la diarrea, la malaria, etc
	Calor insoportable	

Obviamente, la primer columna se perfila al problema de los desechos y su disposición, la segunda columna a la deforestación, y la tercer columna a la contaminación de las aguas. En algunos casos, la problemática cruzará varias categorías, pero el profesor podrá ubicarla donde más impacto tenga.

En caso de que haya problemáticas planteadas en exactamente los mismos términos, se podrán omitir, evitando las repeticiones. Esto se hará con el consentimiento de quien está presentando la problemática.

Aunque en el ejemplo se han encasillado las problemáticas, en el ejercicio se deberá aglutinar a las que sean afines sin enmarcarlas bajo determinadas categorías. Las categorías deberán surgir del siguiente paso, con los estudiantes.

- Una vez que todas las problemáticas estén escritas en el pizarrón, el profesor orientará la discusión a fin de establecer relaciones entre las problemáticas, tratando de identificar primero cuáles son afines y abordan la misma problemática desde diferente punto de vista, luego cuáles se pueden considerar causas y cuáles se pueden considerar efectos de problemáticas.

Siguiendo el mismo ejemplo, se procedería así:

	Grupo 1	Grupo 2	Grupo 3
CAUSAS			Contaminación del río
PROBLEMA PRINCIPAL	basura en la calles	Despale o deforestación	Falta de agua potable
EFFECTOS	Inundaciones en el pueblo en la época de lluvias	malos inviernos que no permiten una buena cosecha calor insoportable	Muchas enfermedades como la diarrea, la malaria, etc.

3. Este momento se puede aprovechar para completar las ideas plasmadas a través de la encuesta. Por ejemplo, podemos discutir con los estudiantes cuáles pueden ser las causas de las problemáticas que no están plasmadas

Una vez establecidas todas las relaciones, e identificados los problemas principales, procedemos al siguiente paso:

4. El profesor, ya sea en el pizarrón o en papelones, presenta la siguiente matriz

Problemas ambientales	Frecuencia de la información	Soluciones planteadas	Recursos disponibles

Procedemos a escribir las problemas identificados en la actividad anterior como principales. Luego contamos el número de encuestas que abordaron la problemática, lo que nos representa la frecuencia con que la problemática se reflejó en la encuesta.

Después procedemos a identificar las soluciones que los encuestados proveyeron, así como los recursos que ellos consideran estaban disponibles para implementar las soluciones.

La matriz va a parecerse a lo que sigue:

C. ORGANIZACION DEL PROGRAMA DE ACCION

Este es el paso más crítico de todo el ejercicio: decidir qué hacer, tomando en cuenta nuestras limitaciones. Procedemos entonces a plantear acciones y a averiguar su factibilidad. Es de esperarse que la encuesta no nos arroje toda la información necesaria, y habrá que discutir mucho en el grupo acerca de la viabilidad de las acciones planteadas. Es en este momento cuando necesitamos la asistencia de otros actores, como representantes del gobierno local, instituciones organismos no gubernamentales que trabajan en la zona, quienes nos pueden ayudar a concretar tareas que nos hayamos propuesto a partir de la identificación de las problemáticas ambientales más sentidas en la población.

Estamos seguros que este ejercicio de investigación, el cual es bien sencillo, te dará muchas ideas, y te servirá de motivación para cumplir con tu servicio ecológico, el cual es un servicio a la comunidad en que te desenvuelves.

Elaborado por: Lic. Jorge Luis Hernández
Dirección de educación Ambiental (DEA)
Ministerio del Ambiente y Recursos Naturales (MARENA)

Revisado por: Equipo DEA

Managua, Mayo 14, 1997

ENCUESTA # _____

a. Cuáles son los problemas ambientales más serios en nuestra comunidad?

1. _____
2. _____
3. _____
4. _____
5. _____

b. Qué acciones sugiere que los miembros de la comunidad deben hacer para resolver los problemas?

1. _____

2. _____

3. _____

4. _____

5. _____

c. Con qué recursos Ud, cree se deben realizar esas acciones?

1. _____
2. _____
3. _____
4. _____
5. _____

Guía de presentación de los proyectos del
Departamento de Carazo

Proyecto que tiene el componente de E/A. _____

Proyecto que no tiene el componente de E/A. _____

- 1- Nombre del proyecto: _____
- 2- Objetivo General:
- 3- Objetivo específicos: _____
- 4- Componentes de proyecto:
 - 4.1
 - 4.2
 - 4.3
 - 4.4
- 5- Etapas del proyecto: I - II- II...
- 6- Etapa actual del proyecto:
- 7- Tiempo de duracion:
- 8- Metas inmediatas:
- 9- Metas mediatas:
- 10- Activ/relevantes/proyecto: a) programadas, b) ejecutandose
- 11- Público destinatario (meta):
- 12- Público casual (indirecto):
- 13- Metodología empleada:
- 14- Informe evaluativo:
- 15- Observaciones: _____

Instituto Nicaragüense de Tecnología Agropecuaria (INTA) de Carazo.	Establecimiento de viveros agroforestales con productores. Capacitación en obras de conservación de suelos y aguas, abonos orgánicos y verdes, labranza mínima, cultivos de cobertura, manejo de plagas, etc... Investigación con abonos verdes.	Municipios de: San Marcos, Santa Teresa, la Paz, La Conquista, El Rosario, Jinotepe y Diriamba.	Mario Carranza de la iglesia adventista 150 vrs. al oeste. Jinotepe Telf. 41 23059
MARENA-Carazo	Agroforestería. Regulación y control de recursos naturales. Educación y capacitación ambiental. Organización y promoción de las brigadas ecológicas y de comisiones ambientales municipales. Promoción de coordinación interinstitucional .	Minicipios de: La Paz, El Rosario, San Marcos, Jinotepe, Diriamba y La Conquista.	Silvio Echavery
Cooperativa Agrícola de Promoción y servicios (CAPROSER)	Proyecto piloto agro-forestal. Financiamiento para el establecimiento de sistemas agroforestales. Reforestación de la cuenca del Río Grande. Asistencia técnica y capacitación en el establecimiento de sistemas productivos diversificados con componentes forestales, prácticas de conservación de suelos y aguas, manejo de plagas, reforestación.	Diriamba	Salvador Mendieta(?)
Proyecto AGROS	Agricultura biológica, especialmente horticultura y café orgánico. Manejo integrado de plagas. Producción de materiales de capacitación agrícola. Conservación de suelos y aguas. Capacitación, asistencia técnica	Madrid, Granada, matagalpa y Jinotega.	Sindy Calderón Tel. 04322680
CEPAD	Formación de brigadas ecológicas. Capacitación y formación de promotores agropecuarios en técnicas de conservación de suelos, abonos orgánicos, reforestación, insecticidas naturales... Promoción de la problemática medio ambiental. Educación ambiental en proyectos infantiles comunales.	Comunidades rurales de Carazo, Rivas y Masaya.	Manuel Martinez

Movimiento por la Paz, la Paz la Acción Forestal y el Medio Ambiente (MOPATMA)	Reforestación, conservación de suelos y manejo y protección de cuencas hídricas. Organización de productores forestales. Elaboración de diagnósticos a productores.	Municipios de; Jinotega, Estelí, Managua, Ticuantepe, Jinotepe, Santa Teresa, La Conquista, Diriamba, Rivas. RAAN (zona de Yule)	Byron Ruiz ✓
CECOTROPIC	Proyectos agro-forestales. Divulgación de la temática ambiental y el desarrollo sostenible a través de la radio. Capacitación en educación ambiental. Formación de una brigada ecológica. Asistencia técnica en el establecimiento de viveros y hortalizas.	Departamentos de Carazo y Estelí	Humberto León Campos ✓
Fundación NAKAWE	Producción de patio. Trabajo con promotoras y enfoque de género. Capacitación.	Municipio de Nindirí	De la iglesia 20 vrs. al norte. Telf. 3671 Nindirí
Alcaldía de Diriamba	Análisis de problemas ambientales relacionados con la basura y el uso de los suelos, para buscar soluciones y normativas.	Diriamba	Fernando Baltodano ✓ Alcaldía de Diriamba.
FUNCOD		Diriamba	
INTA-Carazo	Capacitación en obras de conservación de suelos y aguas, establecimiento de viveros agroforestales, manejo integrado de plagas, insecticidas naturales... Validación y promoción de técnicas de la branza mínima. Investigación sobre cultivos de cobertura y abonos verdes.	Municipios de: Jinotepe, San Marcos, La Paz, Santa Teresa, La Conquista, Diriamba, Dolores.	Mario Carranza ✓ De la iglesia adventista 150 vrs. al oeste. Jinotepe Telf. 41 23059
Proyecto de Promoción Campesina	Agricultura orgánica y diversificación de cultivos. Rescate y promoción de la medicina natural. Reforestación y conservación de suelos. Desarrollo del patio. Divulgación, capacitación, intercambio y promoción de prácticas de agricultura sostenible y de manejo y protección de los recursos naturales.	Municipios de: Santa Teresa y La Conquista	Elvia Ramirez ✓ en Santa Teresa. Telf. 088 24 364 Apdo. postal 01, Jinotepe

Programa de plaguicidas del MINSA	Vigilancia y seguimiento de intoxicaciones causadas por plaguicidas. Capacitación sobre manejo, captación, diagnóstico y tratamiento de intoxicaciones causadas por plaguicidas. Legislación. Coordinación interinstitucional.	Departamento de Carazo.	Héctor Ruiz
Instituto Diriangen	Brigadas ecológicas. Educación y sensibilización sobre temas de medio ambiente y recursos naturales. Experiencia en huertos escolares, viveros y uso de suelos, jardinería Apoyo a reforestación y planes playa. Cordinación con la alcaldía, MARENA	Diriamba	Emilitina Pérez Vado. Telf. 42 22 265 Diriamba.
Instituto Nacional Tecnológico (INATEC)	Promover acciones y proyectos educativos para sensibilizar al personal de INATEC y a la comunidad educativa en cuanto a la conservación del medio ambiente y de los recursos naturales. Educación ambiental (Plan de Acción de Educación Ambiental en la Formación Profesional) a partir del 97. Programa de inspección y mantenimiento de vehículos automotores. Capacitación sobre abastecimiento y conservación de aguas, saneamiento y calidad ambiental, auditorias ambientales, ecología y desarrollo sostenible, metodologías de estudios de impacto ambiental y legislación ambiental. Divulgación de temas medio ambientales y ecológicos Brigadas ecológicas.		María Cristina Dominguez