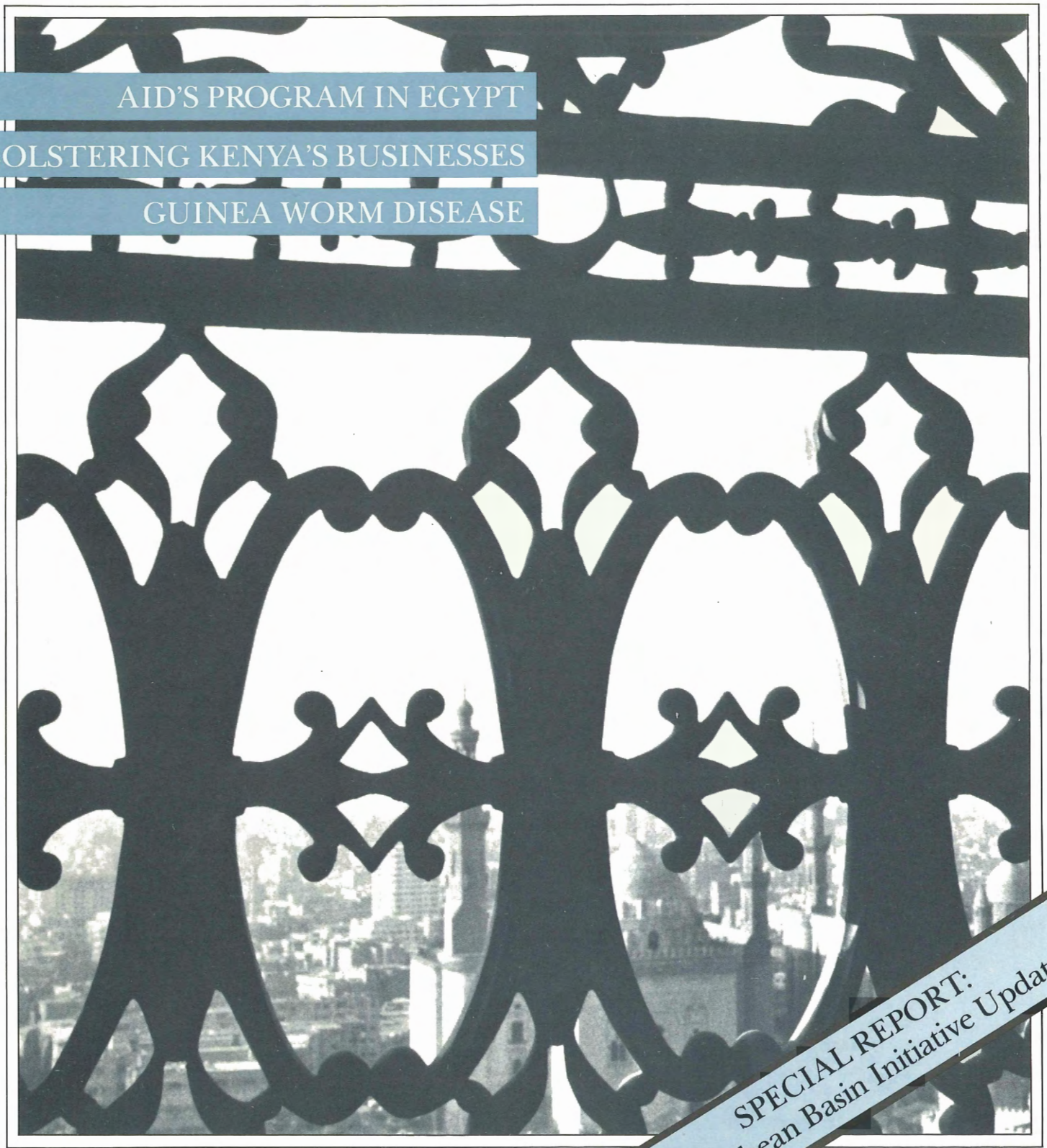
AGENCY FOR INTERNATIONAL DEVELOPMENT

SUMMER 1984

HORIZONS



AID'S PROGRAM IN EGYPT

BOLSTERING KENYA'S BUSINESSES

GUINEA WORM DISEASE

SPECIAL REPORT:
Caribbean Basin Initiative Update

AGENCY FOR INTERNATIONAL DEVELOPMENT VOL. 3 NO. 3 SUMMER 1984

HORIZONS

On the cover: Cairo, a city of contrasts, seen from the Citadel. A look at U.S. assistance to Egypt shows a mosaic, mortared with industrial and economic growth, inlaid with peace. Article begins on page 16.

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ACCENT ON DEVELOPMENT

REFUGEES are dominated by one feeling, and that is a painful, traumatic, and deep sense of loss, writes Ron Baker of the British Refugee Council and European Consultation on Refugees and Exiles. Baker delves into the emotional life of refugees in *The Psychosocial Problems of Refugees* which he compiled and edited from papers given at an international seminar in the United Kingdom in 1981. General medicine, psychiatry, social psychology, social work, and nursing are covered. To order, write the British Refugee Council, Bondway House, 3/9 Bondway, London SW8 1SJ, U.K.

On the subject of refugees, the U.S. Committee for Refugees' annual survey, *World Refugee Survey 1983*, identifies major issues in refugee affairs and includes articles by experts in refugee resettlement. Country reports on refugee populations and a directory of refugee assistance organizations are included. The committee comes under the umbrella of the American Council for Nationalities Service. For more information, contact the U.S. Committee for Refugees, 20 West 40th St., New York, NY 10018; telephone (212) 398-9142.

IT'S A MATTER OF TASTE: People are opting for better taste over accessibility and improved health when it comes to water for drinking or cooking. So reports a study by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). It found that users consider water quality (taste and odor) more important than the distance of the water source. Disputes over water ownership and access also influence people's water use choices.

The findings challenge the belief that poor, mostly illiterate rural people fail to use improved water supplies because of inappropriate technologies or a lack of information about the relationship of water to health, according to the UN Development Program's *Decade Watch*.

The study also showed that people often find hand pumped tubewells hard to use. Many consider tubewell water, often high in iron, unsuitable for cooking.

The solution, say researchers, is to use villagers' preferences and water use patterns as the bases for planning, engineering, and health education.

For further information, contact ICDDR,B, GPO Box 128, Dhaka 2, Bangladesh.

PUMPING COAL? AID and the Philippine government are looking into the possibility of substituting mixtures of coal and water for oil to generate electricity. The mixtures are synthetic fuels in which finely powdered coal is dispersed in water and suspended in such a way that a stable, homogeneous fluid is produced, containing 70% to 75% coal by weight. The fuel can be pumped, handled, and burned like fuel oil and used in existing oil-burning equipment with few modifications. Revamping equipment for the coal-water mixtures rather than switching to pure coal would save in one Philippine oil-fired generating station about $300 million in foreign exchange that can otherwise be spent for capital investments. Moreover, the recurring use of coal-water mixtures in this station would save the Philippines about nine million barrels of oil a year, or about $270 million in foreign exchange.

GUAVAS, PAPAYAS, AND MANGOES are fairly well-known tropical fruits, but what do we know about soursop, cherimoya, and mongosteens? There are many other tropical fruits largely unknown outside their native habitats, that could prove economically important in the future.

Information on topics ranging from harvesting implements and storage techniques to potential markets are covered in a new bibliography of 650 exotic fruits published by the AID-funded Postharvest Institute for Perishables (PIP) at the University of Idaho.

PIP also recently published a 950-entry bibliography on export marketing, mainly for agricultural products.

Copies of both bibliographies are available from the Postharvest Institute for Perishables Information Center, University of Idaho, Library, Room 314, Moscow, ID 83843.

STORING RICE OF YORE: War in Cambodia threatened numerous traditional Khmer rice varieties with extinction—a loss that was potentially disastrous for farmers.

But thanks to the International Rice Germplasm Center at the International Rice Research Institute (IRRI) in the Philippines, the Khmer rices are alive and growing. Dr. T. T. Chang, head of the germplasm center, said IRRI and Cambodian scientists worked together to collect and preserve the Khmer rice germplasm in the early 1970s—before the war began.

Speaking at the 1983 meetings of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America, Chang discussed the function of the germplasm center.

A major threat to the survival of traditional rice varieties is their replacement on rice farms with new, high-yielding varieties. Furthermore, with construction of dams, highways, and houses, as well as the clearing of forests, self-perpetuating wild rices adjoining cultivated areas also are dwindling at an alarming rate.

Chang said many traditional varieties and several wild rices have high levels of resistance to several diseases and insects—resistance that can be bred into modern rice varieties.

IRRI's rice germplasm center often is cited as a model center for crop germplasm conservation. It has a comprehensive program of acquisition, field conservation, seed multiplication, systematic characterization, documentation, seed preservation, germplasm distribution, and periodic seed rejuvenation.

The center has collected more than 10,000 rice varieties from remote areas of the world since 1971, in collaboration with rice research centers in other countries. About 25,000 additional seed samples have been assembled by workers in national programs.

According to Chang, the germplasm center distributes the largest volume of seeds in the world, yearly supplying as many as 11,000 seed samples to foreign breeders. IRRI researchers in the Philippines use nearly 50,000 acquisitions a year for rice improvement.

The IRRI center currently has 70,000 cultivars, wild relatives, and genetic testers, which it is holding in cold storage for various time periods. To insure against loss of irreplaceable germplasm, the National Institute of Agricultural Sciences of Japan, the U.S. National Seed Storage Laboratory, and IRRI store duplicate seed stocks. As shown dramatically by the Khmer varieties, these preservation sites are insurance against loss of irreplaceable germplasm.

Nevertheless, Chang said that collection of rice germplasm from around the world is far from complete. About 50,000 more acquisitions are yet to be made. IRRI and the International Board for Plant Genetic Resources (IBPGR) are working together to do just that. IRRI and IBPGR are among the 13 international agricultural research centers in the Consultative Group on International Agricultural Research. They receive about 25% of their core funding from AID.

LOCAL GOVERNMENTS in Bangladesh, as in most developing countries, rely heavily on financing from the central government. These funds are transferred largely through grants for specific uses.

According to a recent AID-funded study of those intergovernmental grants in Bangladesh by Syracuse University's local revenue project, the most important decision facing policy makers is whether the grant system should be for relief or development. It maintains that both objectives cannot be served efficiently by the same grant system at the same time. A grants program emphasizing relief should include better targeting on the needy. If development is the primary goal, then grants should be better coordinated and more closely monitored; they also should include plans for project maintenance. Syracuse recommends using fewer but larger grants, and distributing grant funds, in part, on the relative capability of recipient localities to use the monies efficiently for development purposes.

One of several ways Syracuse suggests stimulating local governments to generate revenue is to distribute more or larger grants to those localities with "high revenue effort." A revenue effort is how much revenue a locality raises relative to what it could raise. Simply put, it is how much effort the government exerts to get what is legally owed. For example, if a property tax is based on the value of individual holdings, then a certain amount of revenue could be expected, providing all property owners pay their share. But, some may pay the full amount owed while others pay some or none at all. If government collection efforts are weak, the revenue raised will fall short of the mark—a "low revenue effort." On the other hand, careful administration and diligent follow-up will more likely result in a higher collection rate. This is a "high revenue effort."

A final recommendation is for the Bangladesh government to establish a system to monitor the actual distribution of grant monies to all local governments under all the grant programs. Such monitoring can stimulate better performance by less efficient local governments through circulation of comparative grant statistics among all recipient governments. It also can enhance the central government's confidence in the increasing administrative capability of local governments.

Copies of the report, "Intergovernmental Grants in Bangladesh," are available from AID's Office of Rural and Institutional Development, Bureau for Science and Technology, Room 608, SA-18, Washington, DC 20523.

POTATOES—EYEING THE FUTURE: Today's increasing food production in developing countries is often thought of solely in terms of the so-called green revolution. That tends to make rice and wheat glamour crops. Even maize, beans, and cassava get high billing.

But the potato is coming into its own in many developing countries. It tops the list of food crops in terms of dry matter and energy production of edible protein per hectare per day—a formidable crop.

International research on potato improvement is conducted at CIP (The International Potato Center) in Peru. CIP scientists are developing techniques for potato production from true seed (seed from flowers), which could provide a significant breakthrough in agriculture in this century, according to CIP officials.

CIP technology has been applied in Bangladesh where in tests true seed has given potato yields of 15-20 tons/hectare in 80-90 days. Although potato production from tubers can give higher yields, the cost of tuber seed is about $1,100 per hectare. True seed costs no more than $50 per hectare.

CIP, one of the worldwide family of research centers in the Consultative Group on International Agricultural Research, gets about 25% of its support from AID.

RUNNING OUT OF SOIL SULFUR: Sulfur deficiency in crop-growing soils is an increasing problem for developing countries. It became a problem because low-yield subsistence agriculture exploited the soil's sulfur reserves. In many countries, enough sulfur wasn't being supplied—from rain and dust, irrigation water and manures, or "old technology" fertilizers like ammonium sulfate and single superphosphate—to maintain yields. Furthermore, scientists in developing countries have not been trained to suspect sulfur deficiency. Many were trained in developed countries, where sulfur pollution rather than deficiency is the problem.

Modern agriculture's focus on high-yield varieties, greater use of low-sulfur fertilizers like urea and triple superphosphate, and intensive cropping increased the demand for sulfur in the soil.

The International Fertilizer Development Center (IFDC), which gets about 40% of its funds from AID, recently published a report on the subject, *Fertilizer Sulfur and Food Production: Research and Policy Implications for Tropical Countries*. It identifies the sulfur problem and research priorities for national and international programs, and estimates sulfur requirements. Copies of the report are available from IFDC, P.O. Box 2040, Muscle Shoals, AL 35660.

WESTERN CONSUMERS get more for their money from certain manufactured goods as a result of increased competition among newly industrializing countries (NICs) in East Asia, says World Bank President A. W. Clausen. Increased competition also sparks established producers to be more productive.

Clausen says that "some industries in the West have been hurt in the process, but the newly industrializing countries import more manufactured goods than they export. Their net effect on employment in the advanced industrial countries is positive."

Policies by some NICs have encouraged imports which, in turn, have contributed to increasing their exports by 13% a year even between 1980 and 1983, a slow period for world trade.

World Bank loans to the region totaled $1.4 billion in the past four years. According to Clausen, the World Bank's five major borrowers in the region have increased their export revenues five-fold over the last 10 years, but their debt-service payments have grown even faster—from 14% of exports in 1973 to 20% in 1983.

ON SATURDAY MORNINGS, extension workers from Guyana's MEDEX program—medex is a contraction of the French words *medicin extension*—in nine isolated communities tune in their two-way radios to talk with a physician at MEDEX headquarters in Georgetown, Guyana. The physician presents a hypothetical case and quizzes the medex workers on steps in diagnosis and treatment. The program is an important refresher course for field workers. In addition, the radios enable these rural health workers to communicate with supervisors and pharmaceutical and commodity suppliers.

An operator in Georgetown not only passes on

radio messages and aircraft schedules for the pharmaceutical orders, but follows up by telephone to check on the orders and patients in the hospital in Georgetown, reports *World Health Forum*.

Two-way radios speed up administrative matters, significantly reducing the time it takes to get essential drugs, and helping ensure a larger and more stable stock. Consultations between field workers and physicians are more frequent and easier. And radios make follow-up with patients in regional hospitals possible.

Medex workers in remote areas report that regular radio contacts with their colleagues have lessened their sense of isolation, boosted their morale, and helped build their confidence.

The network will soon be expanded to link with Ministry of Health offices and the Georgetown hospital. More health workers in remote areas will be getting radios, as will regional hospitals, public health nurses, and malaria workers in remote areas.

Guyana started its MEDEX program in 1976 with assistance from AID and the Canadian International Development Research Center. AID has provided technical assistance through the Health Manpower Development staff of the John A. Burns School of Medicine, University of Hawaii at Manoa.

CAMEROON'S PLANTAIN STANDS are being threatened by a disease that could wipe out the entire crop. In French the disease is called "maladie des raies noires" because black streaks, caused by a fungus, result in leaf destruction. The disease may have been introduced to Africa from Central America by contaminated plants. It first attacked crops in Gabon and then spread to neighboring countries. The fungus has caused much damage in Central America to both plantains and bananas.

All plantain varieties in Cameroon have been affected. Fungicides are the only way to fight the disease, greatly increasing costs and making production unprofitable. The only hope of saving the industry, reports the International Development Research Center, lies in the introduction of the plantain variety Saba, a cooking banana which is resistant to the fungus. In certain areas of Cameroon, people have already introduced the new variety because their plantain stands succumbed.

PLANNING AHEAD is sometimes easier said than done. The U.S. Department of Agriculture has made the job of advance planning easier for technical assistance teams. A paper, "Making Technical Assistance Teams More Effective: The TPM Approach," explains the need for team planning and offers examples. (TPM stands for team planning meeting.) It is available from USDA, Office of International Cooperation and Development, Technical Assistance Division, Agriculture Development Project Management Center, Room 4301, Auditors Building, Washington, DC 20250; or telephone (202) 447-5804.

ONE STEP FURTHER: International Agricultural Research Centers (IARCs), charged with developing technology to help increase the world's food supplies, are asking what they can do to make sure advances in the field end up on hungry people's plates.

One way, according to participants in a recent workshop sponsored by the IARCs and the UN Subcommittee on Nutrition, is to branch out to related sciences and technologies. Taste, preparation and storage requirements, costs, and nutritional make-up were suggested areas for further study by IARCs.

Centers might also collect and analyze data on nutrition and dietary patterns. Some areas to look at are the role of women in nutrition, the impact of cash crops on nutritional practices, decision making inside the home, and seasonality of crops.

Other workshop recommendations included strengthening ties with nutrition institutes, hiring nutritionists or consumption economists, forming nutrition advisory groups, developing a method to analyze the pros and cons of better nutrition vs. increased yields; and sponsoring workshops for research personnel in farming systems research personnel.

ATTITUDES toward population growth among governments in the developing world are changing. Today 62 nations in the developing world feel that their birth rate is too high and likely to slow their development efforts. This is a turnaround from the early 1960s when only four developing countries showed concern over their birth rates.

According to the *1984 World Population Data Sheet* of the Population Reference Bureau, Inc., world population totaled 4.8 billion in 1984, growing at a rate of 1.7%, or 83 million people a year. World population should reach the 5 billion mark by 1987, and top 6 billion by the end of this century, demographers Mary Kent and Carl Haub predict.

They report that while overall population growth rates have declined steadily, significant population growth continues to be the trend. Most of that growth will be in the Third World.

AID to Coordinate Completion of Grenada's Point Salines Airport

President Reagan signed a Foreign Assistance Act, Section 614 Determination to reprogram $40 million in Economic Support Funds from Lebanon to Grenada. Nearly half of the sum—$19 million—will be obligated to complete the Point Salines airport. The balance will be used to finance long-term development projects, rehabilitate the telephone system, a mental hospital, and radio station.

"We have determined that the airport is vital to the revival of Grenada's economy, left in shambles following four and one-half years of mismanagement under the Cuban-supported Bishop regime," President Reagan said.

The airport will boost tourism in Grenada, generating badly needed foreign exchange to enable the private sector-oriented economy to revitalize itself. With the new airport, Grenada could expect to see 100,000 tourists by the year 2000—twice as many as would be possible without the facility. Tourism, which can be expanded faster than agriculture, would generate jobs for at least 4,000 people.

Jay F. Morris, Deputy Administrator for AID (seated at left), and W.O. Goodrich, Vice President for Morrison-Knudsen International Co. of Boise, Idaho (seated, right) at the signing ceremony for completion of Grenada's airport. Standing are Sen. Steven D. Symms (R-ID) (left) and Sen. James A. McClure (R-ID) (right).

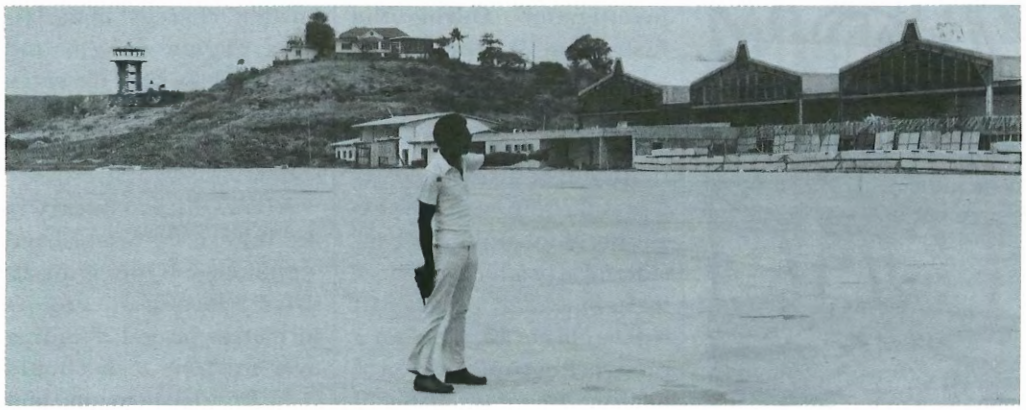
In December and January, Wilbur Smith and Associates, an AID contractor, conducted an economic and technical feasibility study to determine if completion of the airport is justified. The study stresses the impact that the completed airport could have not only on tourism, but also on agriculture and growth of the manufacturing sector, thereby improving Grenada's balance of payments. An international airport, on which jumbo jets can land during the day or night, can provide direct access to foreign markets and facilitate exports.

Although the U.S. contribution would cover the major portion of completion costs, the project has elicited a significant response from other donors. The Canadian government pledged up to $6.4 million; the European Economic Community pledged as much as $1.6 million, and the British government pledged approximately $500,000. Other governments are considering providing some fuel and asphalt to complete the airport project.

The prime AID contract for completing the airport was awarded to Morrison-Knudsen International Co., Inc. of Boise, ID. They will be responsible for design, engineering, and construction. Construction should be completed in record time, with current plans calling for opening the airport to day and night traffic by October, 1984.

The vehicle used to reprogram the money—Section 614 of the Foreign Assistance Act—permits the President to use up to $250 million in foreign assistance funds (but not more than $50 million in a single country) notwithstanding any provision of law, if he determines it to be important to the security interests of the United States.

Use of this authority requires advance notification of and consultation with the chairmen of AID's authorization and appropriations committees, as well as the speaker of the House and president of the Senate. ■



James Habron, associate director of AID's Regional Development Office in the Caribbean and AID representative to Grenada, points to the planned terminal area.

AID Creates Interagency Environmental Task Force

An interagency task force organized by AID is taking action to prevent the destruction of plant and animal species in the developing world.

The panel will examine the potential hazards posed to plant and animal species in developing countries. It also will attempt to formulate specific policies and programs for helping developing country governments protect living natural resources.

The task force, chaired by Dr. Nyle C. Brady, AID's Senior Assistant Administrator for Science and Technology, includes representatives from the Departments of Interior, Agriculture, Commerce, Justice, and Health and Human Services. Also represented are the Smithsonian Institution, the National Science Foundation, the President's Council on Environmental Quality, the Environmental Protection Agency, and the Army Corps of Engineers.

Technical working groups will examine a broad range of environmental problems affecting plants and animals, aquatic life, microbes, and ecosystems. Federal experts in agricultural research, wildlife and park management, forestry, environmental planning, genetics, and germplasm will contribute to the working groups.

The task force will submit recommendations to the Congress by November 22, 1984. ■

Bioenergy Users Form Network; Tech Transfer a Priority

Developing countries that either have bioenergy programs or are seriously considering them are forming a new organization, the Bioenergy Users Network (BUN). Over the last several years, developing countries have increased their interest in the commercial potential of bioenergy. In several countries, bioenergy is considered a key to rural development because it can provide energy and markets for crops at the same time. However, many bioenergy efforts planned or under way lack management experience and technical know-how. BUN should help meet these needs and tackle crucial research problems.

One of the network's first activities will be to establish a means for transferring expertise among developing countries. A roster of experts will be created with enough names so that assignments can be rotated. Technologies, resource management, and systems analysis are the three initial areas of investigation. During the first year of BUN operation, additional areas of investigation should surface.

A second major BUN activity will be assessing services and equipment. For example, if a country is considering a product or service for its bioenergy program, it will be able to ask BUN for a reference or confirmation of quality. A country also will be able to ask BUN to recommend a service or product to meet a specific need. These include identifying consultants and firms that can provide service; cataloging firms that manufacture bioenergy-related equipment and parts; listing current donor programs, their emphases and goals; and identifying private investors and determining criteria for investment.

BUN also plans to sponsor regional training courses and workshops to develop the skills needed in member countries and to determine priority needs in bioenergy research. It is expected that BUN will support research in gasification, direct combustion, charcoal manufacture, engine design, and fuelwood species. Research will take cultural attitudes and social customs into account.

AID's Office of Energy in the Bureau for Science and Technology is providing assistance during the group's formative period. Funding over the long term should come from participating host countries as well as other international donors. ■

New Foundation Helps Thailand Build Reservoir of Managerial Talent

Thailand's current dynamic economic growth offers bright prospects for the long run. However, in the short term, this growth has focused attention on the critical shortage of trained managers for small and medium-sized businesses.

An AID Bureau for Private Enterprise (PRE) team visited Thailand in 1982 to study the investment climate there. The team pointed out the importance of increasing Thailand's supply of managers trained in international finance as well as modern business management techniques.

To follow up on the problems identified by the team, PRE sent two management experts to Thailand. They were Margaret Graham, then-assistant professor at Harvard Business School, who also was on the first team, and Richard Floor, a lawyer with the Boston firm of Goodwin, Proctor, and Hoar. They established the Institute for Management Education in Thailand Foundation (IMET), a private institution, with a $1 million seed grant from AID's Bureau for Private Enterprise. IMET institutionalizes for the first time a mechanism for coordinating management training planning for the private sector in Thailand. U.S. Ambassador John Gunther Dean has actively promoted IMET to U.S. and Thai businesses. AID's mission in Thailand also supports IMET activities. IMET, in turn, has raised approximately $400,000 in private contributions which support management training programs run by Thammasat and Chulalongkorn Universities, the National Institute for Development Administration (NIDA), and the Thai Management Association.

IMET's fundraising success is due in large measure to mirror legislation in both Thailand and the United States which granted it tax-exempt status in both nations. As a tax-exempt private, non-profit organization, IMET is able to receive financing and commodities from both Thai and U.S. businesses, and in turn channels them to major training programs run by Thai institutions. IMET's tax-exempt status has stimulated the support necessary for its programs to have an impact on Thailand's looming management crunch. International enterprises working in Thailand find the IMET mechanism attractive because it allows for other institutions to share in responsibility for training. In the past, most employee training had to be done within their own organizations.

Dr. Chaovana Na Sylvanta, chairman of the Institute for Management Training in Thailand Foundation and Privy Councillor to the King of Thailand, and U.S. Ambassador John Gunther Dean, vice chairman, flanked by other directors from the public and private sector.

According to Graham, now a Boston University professor, Thailand is facing a dearth of well-trained managers. Primarily family-owned and operated, Thai companies have successfully relied on relationships, experience, and seniority rather than on professional training. But now, businesses are expanding to the point that family members can no longer fill all the jobs that need to be done. U.S. businesses which were the major trainers and employers of professional managers, must now compete with Thai companies for trained personnel.

Thailand's current five-year plan has placed more emphasis than ever on small and medium-sized businesses. But the lack of basic management know-how among these companies has slowed productivity. The problem is compounded, Graham notes, because satisfactory extension courses for currently employed managers are rare.

In addition, Graham says, "owners are not likely to have the time or inclination to look to management schools for information about basic marketing or accounting, and they often lack the resources to hire employees who are specially trained in these fundamental management skills."

According to Graham, weaknesses in management training are perpetuated by a lack of material for management courses that applies specifically to problems faced by Thai businesses, and to the difficulty of keeping qualified professors in the classroom. Instructors are paid on the civil service scale, Graham points out, which offers them an income only a fraction of what they could earn in the private sector.

With an eye toward solving some

of these problems, the AID-sponsored IMET has helped develop management training programs tailored to the Thai economy. The programs increase the capacity of those institutions in Thailand now providing management training for the private sector to do so more effectively on a larger scale.

To date, over 1,000 managers of small firms have attended seminars.

University representatives on IMET's board channel proposals for needs for their institutions to the Board which decides on priorities for funding. Activities that were financed by the Foundation in 1983 were targeted for managers at all levels in both central and provincial regions.

One of Thammasat University's programs was geared to rural managers from agribusiness. Nearly

"Frequently, managers who have completed training make donations to the foundation."

150 students were recruited for several four-day courses. Since only a few students had more than an elementary school education, classes were kept small to ensure individualized attention. The seminars emphasized real-life business problems rather than business theory.

Chulalongkorn University launched a similar program for rural managers from small and medium-sized agribusinesses and manufacturing firms. Students from major industries in four regions outside Bangkok were brought together. An evaluation showed later that students gained a community spirit and a better sense of how other businesses operated in an integrated economy.

Village business leaders from 18 provinces attended NIDA's seminar on management, and a 10-day course on marketing drew managers from 23 provinces. Many of the participants had built up their own businesses from scratch, but they needed modern business skills and ideas to improve efficiency. The classes focused on problem-solving techniques. The marketing course, for example, sharpened managers' ability to compete in the local and international markets for rice, corn, and tapioca, Thailand's major crops.

The initial short-courses and seminars for managers were conducted at Chulalongkorn by professors from U.S. universities like Stanford and the University of Southern California. These U.S. instructors helped to train Thai professors, who now conduct their own courses in marketing, accounting, personnel management, and other business fields.

The Thai Management Association also took a leading role in developing an indigenous training program based on American expertise. Through the association, U.S. professors helped train employees of a number of prominent Thai firms to run their own management trainee programs.

These efforts should leave a lasting positive imprint on the Thai economy. And they have been successful in large measure because of the emphasis placed on the program by the Thai business community, the Thai government, and AID.

The program's high visibility has been enhanced by the many prominent figures who serve on IMET's governing board. Among these are Chairman Chaovana Na Sylvanta, Privy Councillor to the King of Thailand, and the U.S. Ambassador who serves as the board's vice chairman.

IMET is an excellent example of PRE's efforts to increase the productive capabilities of business enterprises in developing countries. It illustrates how creativity, mixed with technical assistance, seed money, and a supportive host-country climate can help head off potentially damaging problems like a shortage of managerial talent. ■

Private Voluntary Organization Goes for Brokering

By Avinash B. Deolalikar

Seeking innovative ways to stretch development dollars, as well as new sources of income, private and voluntary organizations (PVOs) are entering the business world. Technology brokering—serving as a go-between for small and medium-sized firms in the U.S. and developing countries—is one field where PVOs are starting to make an impressive dent.

Smaller firms are an ideal market for PVOs to tap. Relatively few brokering services are available to the smaller business interested in joint ventures with Third World firms. This is because private consulting firms have concentrated their brokering efforts on larger businesses where profits are greater. Moreover, this assistance satisfies PVOs' long-standing development goals of transferring technology and generating employment in the developing world.

Volunteers in Technical Assistance (VITA), known mostly for its work in developing "hardware," particularly energy-saving technologies for use at the village level, is one such AID-supported PVO now offering brokerage services. VITA entered the field of international technology brokering this past Spring when it participated in an investment mission sponsored by the Overseas Private Investment Corporation (OPIC). VITA promoted technologies developed by three U.S. firms to small firms in India. The U.S. products included microcomputer software, solar refrigerators, and pharmaceuticals. The experience provided some valuable lessons and prepared the ground for future efforts.

VITA learned that small businesses often don't know about op-

portunities in developing countries. Small, high-technology firms need to learn that licensing their technologies or going into joint ventures with foreign firms makes good business sense. It opens up new markets for their products or technologies. It took VITA to pique the interest of the firms it represented.

U.S. firms also need help in conforming their plans to the policy, capital, and labor conditions of the countries where they do business. The software manufacturer's proposal, for example, used wage rates and production levels more in line with U.S. standards than Indian ones. VITA helped the firm modify its plan to accommodate the wishes of the Indian firms.

"Developing country firms need help selecting products that mesh with their resources."

Firms in developing countries, too, need help selecting products that mesh with their technical, financial, and personnel resources. An Indian chemical manufacturer, for instance, wanted to meet the U.S.-based software manufacturer even though it was evident that the firms were ill-suited for a link up. Instead, VITA was able to put the Indian business in contact with U.S. manufacturers of products similar to their own.

Another lesson learned was that PVOs can help U.S. firms determine the best possible of several partners for a joint venture. During the OPIC mission, VITA based its screening process on the historical performance of the Indian firms, their technical competence, financial strength, and managerial efficiency.

Brokers play a vital role keeping negotiations going over the rough spots. Take the case of the solar refrigerator manufacturer. Frustrated by Indian government policies and the business practices of the Indian firm, it threatened to withdraw from the deal. VITA convinced the company that these problems were part of the negotiation process and that given sufficient time, mutual trust and confidence would develop between both parties. The manufacturer finally reached an agreement with the Indian firm. The agreement is now awaiting Indian government approval.

VITA was also able to gain useful experience in establishing a fee

structure for brokering assistance to U.S. firms. Fees ranged from a 5% equity participation in the proposed joint venture to 15% of the total capital outlay of the proposed project. The companies didn't pay a down payment for brokering services.

The investment mission thus proved to be a useful first step for VITA into the area of industrial brokering. However, it did raise an important question: Can a PVO effectively represent more than a few companies at a time?

One solution involves PVOs working through local technical consultancy organizations (TCOs). Initially, PVOs may train TCO staff in technology-based management practices so they can better serve their constituents.

With AID support, VITA has joined up with an umbrella organization, the Gujarat Industrial and Technical Consultancy Organization (GITCO), based in Ahmedabad, Gujarat state, India. VITA and GITCO have agreed to become agents of small and medium-sized firms in their respective countries. They plan to negotiate technology transfer agreements on behalf of many firms from both countries, saving valuable time and travel costs that would be incurred if each firm had to negotiate on its own. This approach increases PVOs efficiency and substantially reduces the cost of transferring technology.

For more information about VITA's activities, contact VITA,

"U.S. firms need help tailoring their business plans to developing country conditions."

1815 North Lynn St., Suite 200, Arlington, VA 22209.

The following books provide additional information on technology brokering: *Technology Transfer and Management in the Developing Countries,* by Harvey W. Wallender III, Ballinger Publishing Co., Cambridge, MA, 1979; "Technology Transfer and the Industrialists in Latin America," by Robert Salas Cupriles, *Integrated Technology Transfer,* ed. Jacques Richardson, Lomond Books, Mt. Airy, MD, 1979, pp. 13-26; and *Guidelines for Development of Industrial Technology in Asia and the Pacific,* by Lalkaka and Chung Woodward, United Nations Center, Bangkok, Thailand, 1976. ■

Avinash B. Deolalikar is a technical adviser at VITA.

Small Ruminant Research Bolsters Developing Country Production Efforts

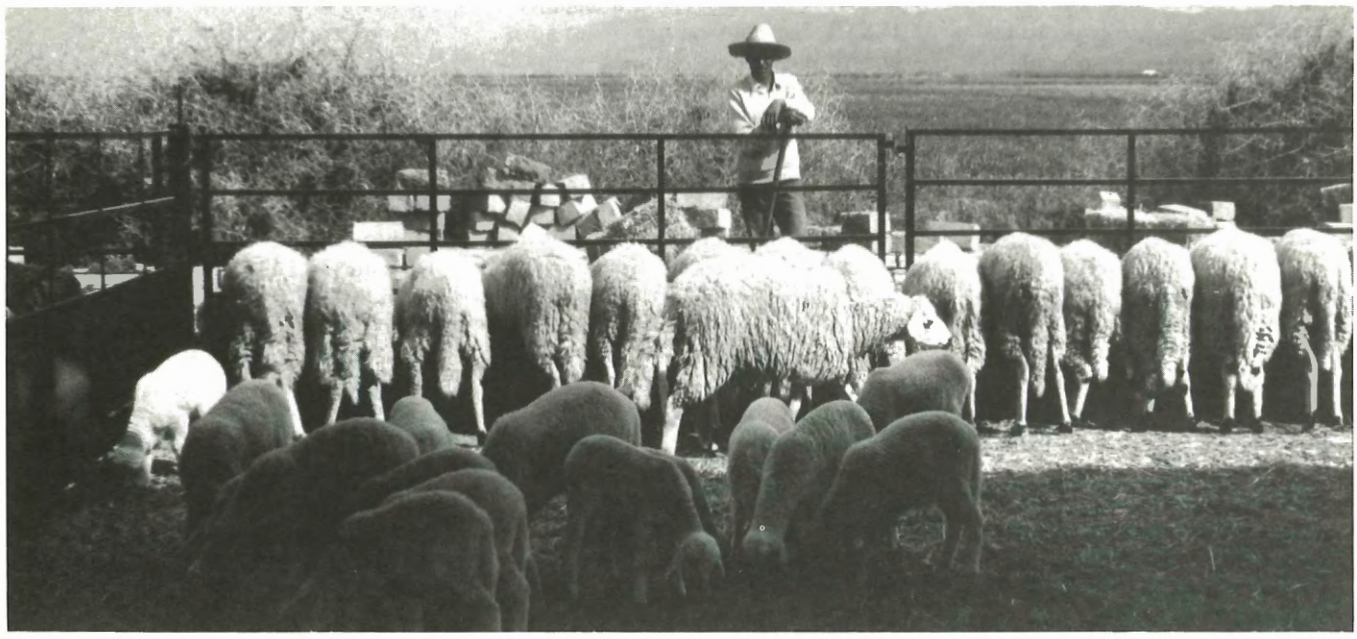
Improving production of sheep and goats managed by small farmers can result in better diets and living standards for more than 100 million people in the developing world. The AID-supported Collaborative Research Support Program on Small Ruminants (CRSP) is providing scientific and technical know-how necessary for this increased production. The CRSP plays a different role in each country in which it is involved.

On Java, Indonesia, for example, goat and sheep population growth has not expanded during the past 20 years. This trend is taking on new significance since dwindling farm size is leading to small ruminants like sheep and goats replacing cattle and water buffalo as primary livestock on small holdings. The 3 million sheep and 7.5 million goats are raised and marketed for their meat and manure, filling a small but important economic niche. Most are kept either in confinement or semi-confinement systems. With the growing importance of small ruminants to Javanese farmers, there is clearly room for improved production techniques.

When scientists from the CRSP looked into the matter, they found that the reproduction rate among Javanese breeds was low, although the breeds had ample prolificacy potential. (Prolificacy is the product of two traits—the number of lambs born at each lambing and the number of lambings per year.) "There were tremendously long intervals between parturition (lambings) in village flocks because of failure to mate ewes," explains William Weir, deputy program director of the small ruminants CRSP. "We found that the ewes were penned up separately and were either not mated during estrus (heat) or were not exposed to the male for long enough periods." Working with villagers and Indonesian animal scientists, Eric Bradford and Monte Bell of the University of California-Davis learned that the intervals between lambings could be shortened simply by rotating the available breeding rams systematically. The team designed a "ram rotation scheme" to solve the problem. Additional constraints to flock production and problems of postnatal mortality are being studied by other CRSP projects on nutrition, feeding systems, economics, and sociology.

Congress mandated the Collaborative Research Support Program in 1975 as part of Title XII legislation aimed at famine prevention. The amendment directs AID to make greater use of the scientific and technical resources in U.S. agricultural universities to help solve food production problems in developing countries. It authorizes long-term support of research programs by U.S. universities in collaboration with institutions in developing countries and with the international agricultural research centers. Participating universities are required to shoulder 25% of the program costs.

A selenium deficiency—deadly to sheep—was detected by scientists working on a breeding project at Morocco's Tadla Farm. They adapted a corrective treatment practice.



A worldwide assessment in 1977-1978 carried out by the former Joint Research Committee of the Board for International Food and Agricultural Development and AID identified research on small ruminant animals as one of twenty priority areas. The Collaborative Research Support Program on Small Ruminants, initiated in 1978, was the first of eight AID/U.S. University CRSPs to take shape.

Scientists from 10 U.S. institutions teamed up with counterparts from ministries and universities in Brazil, Peru, Kenya, Morocco, and Indonesia. These nations were selected because of the importance of sheep and goats in their agricultural output, and because federal and regional research institutions are already in place. These overseas collaborating institutions have made in-kind contributions equivalent to a total of $1 million a year to the small ruminants program alone.

"The original planning group emphasized genetic research for sheep and goat production in developing countries," explains Weir. "Increasingly we found that some of the other factors need to be studied, particularly those related to utilization and sources of feed." In Kenya, he says, "CRSP scientists are planting forage crops along fences and on the edges of fields where food for human consumption is grown. We want to test and adapt varieties of crops for ruminants to see if they can be produced without interfering with food planted for human consumption."

In 1980, while selecting goats imported in previous years for a project to improve milk production by crossing U.S. and European goats with native goats, researchers in Kenya noticed symptoms of caprine arthritis-encephalitis (CAE). CAE is a crippling disease that causes lameness and swollen joints. Sometimes called "big knee disease," it is caused by a retrovirus—a virus that lasts throughout the host's life and produces the disease only after long incubation periods. Scott Adams of the University of Washington went to Kenya and worked with officials in Kenya's Ministry of Livestock Development and CRSP scientists checking imported U.S. and European goats and native goats that had been in contact with the imported goats. While only a few active cases were identified, other goats showed clinical signs of CAE. A team of Kenyan veterinarians continued the task and eliminated the diseased animals, thus bringing the disease under control. Continued research was able to demonstrate that CAE had not passed from buck to doe during breeding, nor through semen to kids. The researchers found that CAE is mainly transmitted in the milk from dam to offspring. Preventing CAE's spread throughout Kenyan herds saved the country millions of dollars.

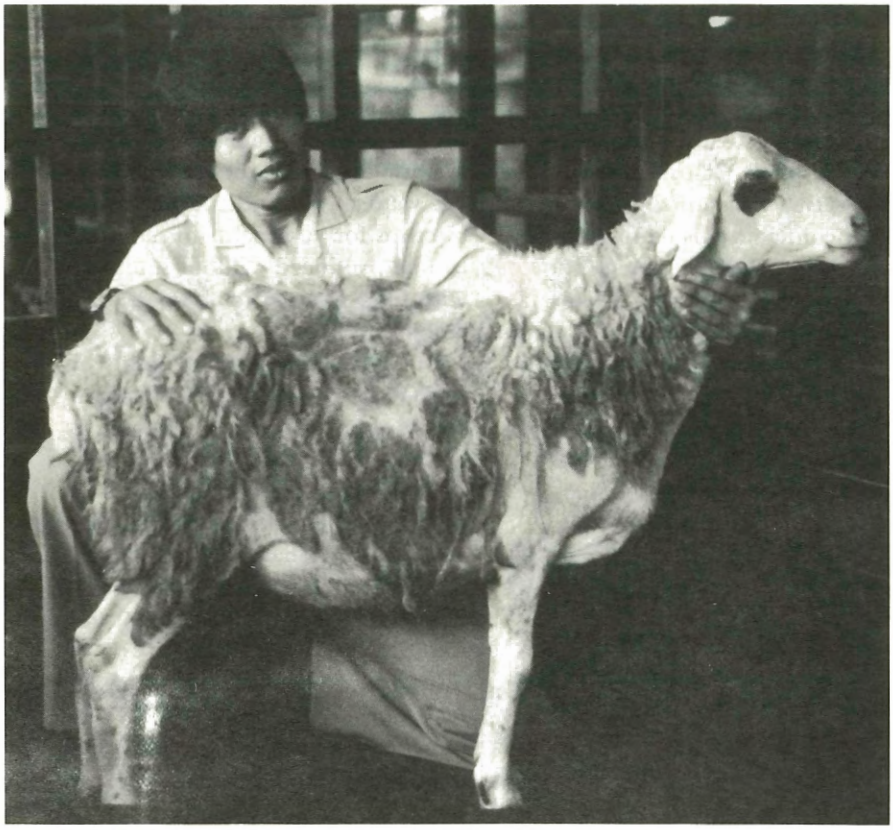
"With the CAE matter settled," says Weir, "the original plan of introducing genes through the use of semen for high milk production is being accomplished." Furthermore, new quarantine standards

Partners in Research

The Collaborative Research Support Program on Small Ruminants (CRSP) recently marked its fifth anniversary by publishing a major report. *Partners in Research* describes the CRSP and cites accomplishments of its 15 research projects carried out in five host countries (Peru, Morocco, Kenya, Indonesia, and Brazil) and the United States. Scientists from U.S. institutions and host countries have contributed to this research program. The report also lists project publications, research collaborators, trainee programs, and administrative officers. Single copies of the report can be obtained from Charles Haines, AID, Bureau for Science and Technology, Office of Agriculture, Room 420. SA-18, Washington, DC 20523.

Sheep and Goats in Developing Countries

Sheep and Goats in Developing Countries, a study produced for the World Bank by Winrock International, assesses the role of small ruminants in the food production systems of developing countries. The study concentrates primarily on mixed herds of sheep and goats grazing dry rangelands, and small mixed farm systems in areas of medium and high rainfall. Constraints on production are discussed, and a balanced system approach for research, training, and development programs is advocated. Also discussed are support activities like herd health programs, and credit, marketing, and pricing strategies for increased small ruminant production. The study is available for $5.00 from the Publications Sales Unit, Department T, World Bank, 1818 H St. NW, Washington, DC 20433.



Scientists studying production techniques in Indonesia found that reproduction rates among Javanese breeds were low although they had ample prolificacy potential.

now developed in the United States and Kenya will help prevent the spread of this debilitating disease.

In Peru, because many organizations are undertaking research on goats and sheep, the AID mission is using the CRSP as a resource to coordinate activities. In one region, new techniques to upgrade alpaca fiber and genetically select breeding stock offer the potential for increasing exports of higher quality alpaca fiber. Other research on feed use and improved breeding systems shows dramatic increases in meat production from sheep flocks.

"Some research results have been serendipitous," claims Weir. Such is the case in Morocco where the CRSP is helping increase sheep production to meet consumer demand for meat and other small ruminant products. The CRSP is working with the scientists of Hassan II University to develop a more prolific breed of sheep that will increase the number of lambs born per ewe. D'Man breed of sheep has a much higher frequency of multiple births than other Moroccan breeds but they are smaller animals and less well adapted to extensive management conditions than the other local breeds. The two types of sheep are being crossed to produce sheep of higher prolificacy and adaptability to irrigated agricultural areas of Morocco. These important prolific genes may be transferrable to sheep in other parts of the world.

When scientists from the CRSP and the government of Morocco joined a U.S. veterinarian from the University of Minnesota on assignment to work in Morocco's irrigated area, they discovered white muscle disease in the region's lambs. This disease is caused by a deficiency of selenium, a nonmetallic element related to sulphur. The correct balance for selenium is tricky. Too much is toxic to the animal while too little causes white muscle disease. The research team adapted a treatment practice which eliminated the white muscle disease problems.

In Brazil, EMBRAPA (the national research organization for agriculture) established a national sheep and goat research center in the northeastern region in 1978. The CRSP is collaborating with the EMBRAPA staff in developing research programs and facilities for the country. The Brazilian government is providing a major portion of the program's funding.

The Small Ruminant CRSP has sponsored at least 100 students from cooperating countries—including 21 at the doctoral level—and held 12 short-courses for 330 participants in host countries. Twenty-three U.S. graduate students also have participated in research projects in host countries.

"What we're doing," explains Weir, "is providing a vehicle for cooperation in working out constraints to sheep and goat production in five developing countries.

"This cooperation is proving effective," says Weir. "The progress we've made has encouraged AID missions to make greater use of the talents of U.S. university staff. University staff has increased its awareness of the opportunities and challenges in the developing world. For example, we can work on livestock diseases in Africa that cannot be studied in the United States.

"But the most promising aspect of the CRSP," claims Weir, "is the bright young people we're finding in the developing countries and their enthusiastic response to collaborating with U.S. experts and training at U.S. universities." ■

William Fred Johnson, international programs officer with the Board for International Food and Agricultural Development, contributed to this article.

Settling Bolivia's Lowlands

By Carol Bradford Ward

Why do many resettlement efforts fail? There are a number of reasons. Social organization disintegrates as century-old traditions and kinship ties are broken. New communities can't get off the ground because settlers from diverse backgrounds disagree on what types of local political and economic organizations best serve their needs. Sometimes agriculture-based communities are settled on soil that cannot sustain production. Or, settlers fail to adjust to their new life and ultimately give up, returning to where they came from or moving on. After nearly 10 years, the AID-sponsored project in the San Julian region in Bolivia's lowlands has a different story to tell.

The Bolivian government has been interested in settling the lowlands for decades. The Chaco War in the 1930s, in which Bolivia lost considerable land to Paraguay, made the Bolivian government painfully aware of the lack of integration of the lowlands with the rest of Bolivia. Also, the untouched lowlands were a useful escape valve for the overpopulated highlands which are short of arable land. The government tried several resettlement schemes with varying degrees of success. San Julian is a good example of a successful project.

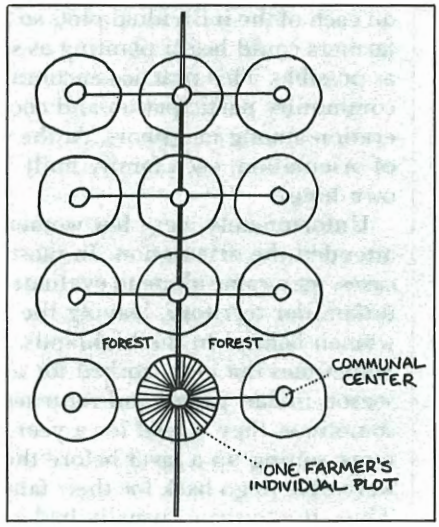
AID's Center for Development Information and Evaluation in the Bureau for Program and Policy Coordination sent a team to San Julian in October 1983, as part of its impact evaluation activities in integrated rural development.

Begun in 1974, AID assistance to San Julian ended in December 1983. More than ten thousand people have settled there, most arriving between 1977 and 1978. The bulk of the settlers were young and just beginning their families. Eighty-five percent of the population of San Julian are Quechua or Aymara Indians from the highlands.

Families were given 50 hectares of land by the Bolivian government in return for their promise to farm it. AID project funds were used to build a road connecting San Julian to the highway to Santa Cruz (the region's commercial center). AID also funded construction of an agricultural service center, and wells for each group of 40 families. Despite shortcomings such as construction problems on the roads and staffing problems at the agricultural center, the project made considerable progress in a very short time.

The cornerstone of San Julian's settlement pattern is the "nucleo." Each has a central area from which individual plots fan out like wedges of a pie. Note two other nucleos forming in the background.

Figure 1: Nucleo Settlement Concept



Thriving communities with small businesses, livestock, orchards, farms, and schools illustrate this progress. And as word of the communities' success spread, new settlers were attracted to the region.

The story in San Julian goes beyond building a new road or well. Three basic factors made this project work: a unique land-use design; implementation by a committed, well-respected private and voluntary organization (PVO); and the new settlers' ability to successfully obtain government services.

San Julian adopted a unique "nucleo" settlement pattern which contrasted with the spontaneous settlement in other parts of the lowlands. Each nucleo has plots for 40 families, and a central area containing the town common, the well, and most private homes. Each family plot is wedge shaped, bordering the central area at its narrow end. Thus, everyone has equal access to the well and other common grounds, and no farmer has a plot any closer to town than any other farmer. The nucleos

are laid out in sets of three with the main road bisecting the central nucleo and a lateral road connecting the two nucleos on each side (see figure 1). This arrangement makes community organization easier and improves access to service facilities. For example, a school in the central nucleo—built by the settlers from leftover building materials—serves children in three nucleos without any child having to walk more than five kilometers. At the time of the evaluation, 66 nucleos had been settled.

FIDES (Foundation for Integral Development), a Santa Cruz-based PVO which organized especially to carry out the AID project and now receives funds from other organizations, is one reason the project thrived. FIDES' staff knew the area and situation well, and was able to expand and adjust as the settlement developed. It maintained a large base camp on the project site with key personnel spread throughout the settlement area. Some of the project staff had been settlers themselves, which strengthened FIDES' credibility among the new settlers. Daily communication by two-way radio kept everyone informed and saved lives on more than one occasion.

A severe flood in May of 1983, for example, wiped out the crops and some of the homes in several nucleos. Since the road was impassable, helicopters flew in food and supplies, and carried out the seriously ill. FIDES worked closely with the settlers during the emergency. By the time of the evaluation five months later, the communities were back on track.

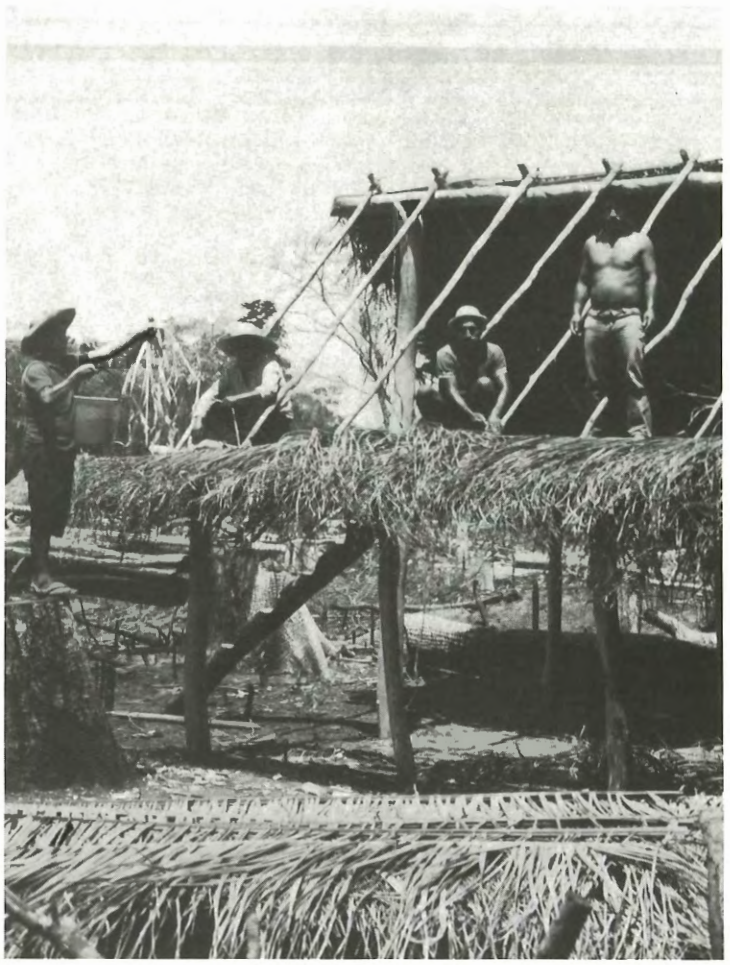
An important element of the resettlement effort was the FIDES orientation program for new settlers. When new settlers arrived in the lowlands, they were provided food and shelter for the first four months. Food aid from the World Food Program (funded heavily by the United States), effectively complemented the development effort because it enabled settlers to survive the initial months until they could produce their own food.

The orientation program held classes in agricultural techniques, food preparation, economic cooperatives, first aid, and survival in the new environment. The classes often were conducted by people who had only recently settled in the area themselves. Working together during orientation, one hectare was cleared on each of the individual plots so that farmers could begin planting as soon as possible. This practice encouraged community participation and cooperation among neighbors. At the end of orientation, each family built its own house.

Unfortunately, very few women attended the orientation. In most cases, men came alone to evaluate the unfamiliar territory, leaving the women behind in the highlands. Sometimes the men worked for a season in San Julian and returned; sometimes they stayed for a year or more setting up a farm before they were able to go back for their family. Thus, the husband usually had a better idea of what the move would entail than did his wife. The wives arrived at the settlement long after their husbands had completed the orientation program, missing what they might have learned about gardens and preparing new foods.

That first year of resettlement was particularly difficult for the women. They began housekeeping in a new setting where the climate was hot and muggy, and where unfamiliar insects and illnesses abounded. Food was scarce because there had not been a harvest. Familiar foods were hard to find, and new foods were difficult to prepare. The women had left their extended family in the interior and did not have time to make new friends. This lack of participation by women from the start appeared to be one of the biggest initial obstacles (although their participation was encouraged by project staff). Yet, much credit for the project's low

Clockwise from left: Map of Bolivia. The well in the center of each nucleo is a popular gathering spot. Men work together to roof a neighbor's house. A successful settler's completed two-story dwelling.



turnover rate rests with the orientation program.

Over the past decade, communication between the settlers and project staff remained open, allowing the program to evolve and change as necessary. This rapport may not have come about if project implementers hadn't been on the scene. FIDES also did everything it could to encourage the settlers to solve their own problems through community organization.

The settlers responded well to this challenge. The community they formed has been effective in obtaining social services from the government. With education a high priority for settlers, school construction and organization had purposefully been left to them. Committees elected representatives who petitioned the Ministry of Education for teachers, stating their needs and pointing out that the schools were already built. The Ministry provided 14 teachers for San Julian.

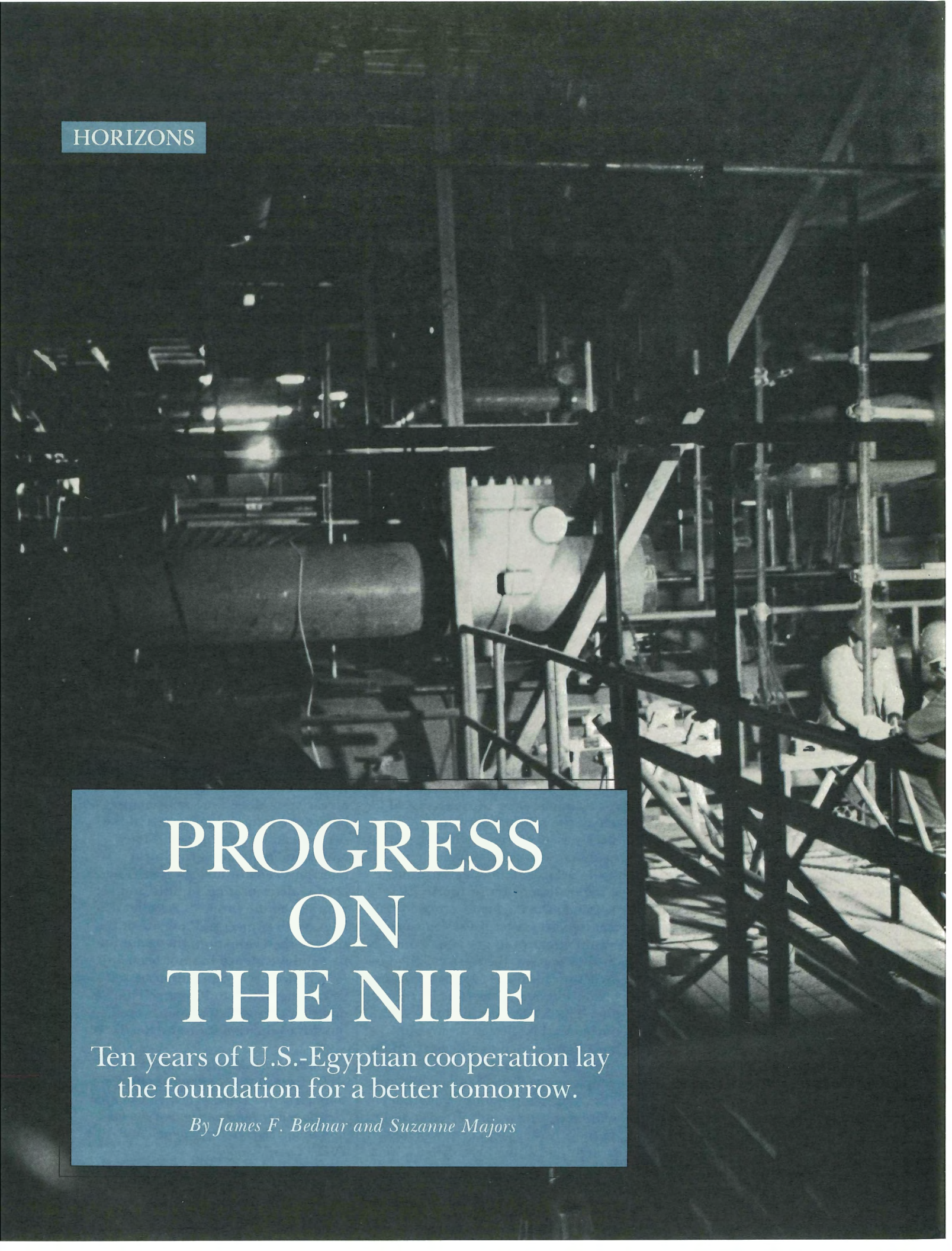
The community also has shown that it responds well under pressure. For example, near the entrance of one of the northernmost nucleos there was an extremely bad stretch of road that was under water for much of the year. The flooded road made it impossible to get seriously ill people to the doctor or crops to the marketplace. After several unsuccessful attempts to get help from outside sources, the settlers relied on their own resources. Since the rainy season was near, there was no time to lose. The settlers decided that each nucleo in the affected area would send 10 men each day to work on the road. The section had to be drained completely and the roadbed built up. They dug out the mud, sometimes with bare hands, and carted it away on their backs. Dry earth was then brought to fill the hole. After a week and a half, others joined the effort. The Bolivian National Institute of Colonization lent a truck and FIDES provided fuel. A lumber truck operator lent some of his equipment. By the rainy season, that section of the road had been repaired. The settlers' initiative indicates that the project will be self-sustaining after outside assistance ceases.

It is extremely difficult to objectively measure the sense of "well-being" felt by the settlers. In general, women in San Julian appeared content once over the hurdle of the first year. They had plenty to eat and saw their children growing, but wanted to improve health care and schools. The men, however, were impatient. They sought better roads, more access to credit, and other community improvements. Nevertheless, the men said they were better off than before and everyone wanted to stay.

It was evident that many settlers were optimistic about the future. Much time was spent removing stumps from fields and planting pastures as investments for the years ahead. Many farmers planted perennial crops like coffee, cacao, and citrus trees. Continuous expansion of fields and home improvements—long-term rather than short-term investments—clearly demonstrated the settlers' optimism.

The San Julian Resettlement project, however, was completed less than a year ago. More time must elapse before the long-range success of the project can be determined. Many environmental and agricultural questions remain unanswered. The road is deteriorating rapidly and may yet be the project's Achilles' heel. With project staff on site at the time of the evaluation, the community's independence has not been fully tested. Will San Julian be self-sustaining in five to 10 years? That's a question that remains unanswered, but this evaluation indicates it will. ■

Carol Bradford Ward is a contractor to AID's Evaluation Applications and Statistical Analysis Division of the Center for Development Information and Evaluation in the Bureau for Program and Policy Coordination.



PROGRESS ON THE NILE

Ten years of U.S.-Egyptian cooperation lay the foundation for a better tomorrow.

By James F. Bednar and Suzanne Majors

This year marks the tenth anniversary of the United States' economic assistance program in Egypt.

The last decade has shown that the AID program is having a noticeable impact. Just north of Cairo, massive grain silos line the river Nile. Further north, a 900-megawatt Shoubra El Kheima power plant—one of the largest construction projects in the Middle East—will soon kick into operation, fueling the energy-hungry country. A billboard flashes news of a $91.4 million AID project to renovate and expand the Rod el Farag water treatment plant. On Egypt's Mediterranean coast, edible oils are discharged from ships to storage tanks on shore.

AID has financed more than 100 development projects. They range from a high-tech $25 million vessel traffic management system for the Suez Canal to innovative health measures such as the $26 million oral rehydration therapy program.

While Egypt is making strides, a number of problems need to be addressed. With Egypt's population of 46 million continuing to grow at 2.7% a year, government subsidizing of food is a mammoth undertaking. The subsidies amounted to about 10% of Egypt's gross domestic product last year. An added drain on the Egyptian economy is the fact that, at present, about one-half of yearly food needs are imported, costing more than $3 billion a year.

The country cannot count on continued increases of foreign exchange earnings from its four major revenue sources: oil exports ($2.5 billion a year), expatriate worker remittances ($4 billion), Suez Canal tolls and tourism ($1 billion each). Meanwhile, import costs continue to grow; they created a $5 billion trade deficit in 1983.

Much that AID does in Egypt helps improve the trade balance. Since 1974, AID's program in Egypt—its largest country program—has totaled about $1 billion annually when P.L. 480 assistance is included. From its earlier focus on financing essential imports and reconstruction, AID has shifted to increased support of productive ventures that provide jobs and expand exports. Technology transfer,

Forty-six million citizens live on 4% of Egypt's land mass where they must compete with businesses, institutions, and agricultural fields for space.

AID in Egypt

W. Antoinette Ford, AID's assistant administrator for the Bureau for the Near East, looks at some of the basic issues affecting AID's development efforts in Egypt in an interview with Horizons' *editor, Sharon Isralow.*

W. Antoinette Ford

Q. Would you describe AID's program in Egypt?

A. The Egypt program is AID's largest. It combines resources from the P.L. 480 (Food for Peace) account with the Economic Support Fund. AID seeks areas of cooperation with the Egyptian government that stimulate progress and serve the needs of the Egyptian people.

In discussing the program, it is necessary to bear the country's history in mind. Government commitment to large-scale social welfare spending put a tremendous resource strain on the economy. And even though Anwar Sadat took measures through his "Open Door" policy to encourage private sector growth, extensive fiscal resources continue to be allocated to subsidize Egypt's large public sector.

Effecting change in a society that provides cradle-to-grave social support takes time.

AID's program is designed to assist the government in making policy changes that improve the chances for economic stability. For example, we've come to recognize the need to encourage the market sector of an economy, even if that sector is a very small one, as is the case in Egypt. This involves acknowledging the reality of a policy environment that still discriminates somewhat against market incentives. The Egyptian government has taken into account the effect those changes will have in the context of its domestic political environment.

Q. How effective has this effort been?

A. I think we're at a point in our program where we and the Egyptian government don't disagree on the need for reforms. We may disagree on the pace. Egyptians may think time is on their side in achieving needed reforms; we, on the other hand, may think policy reforms should occur more quickly.

Egypt has taken steps in the right direction. By our measures, however, they may seem like small steps, but in the context of Egyptian society, they have been important.

Q. Is there a specific example we can point to?

A. One area where AID is trying to encourage policy reform is energy. If Egypt can reduce subsidizing energy prices and allow prices to reach world

Technical assistance provided under the Small Farmer Production project has shown farmers in the Sakara governorate how to raise tomatoes as a third crop by using plastic sheeting. Arnold Radi, director of AID's agriculture division (left), and Mahmoud Noor, the Egyptian project director, talk with farmers who experimented with the technique.

institution building, private sector development, and policy dialogue all play key roles in AID's program.

This development strategy was endorsed last November by the Commission on Security and Economic Assistance (Carlucci Commission). The bipartisan commission was created in February 1983 to review U.S. foreign assistance programs and make recommendations to the President and Congress on how these programs' objectives can best be achieved. The commission submitted its final report to Secretary of State George Shultz November 21, recommending integrating security and economic aid, increasing support for assistance programs, and improving assistance evaluation.

Technology Transfer

When the U.S. space shuttle Enterprise flew over Egypt last July, signs of an ancient river system buried deep below the western desert were found. The discovery renewed Egyptian hopes of making the desert bloom. In February, an AID-financed team of five geologists began an extensive study at the river basin area, hoping to find groundwater.

To the east of the Nile, U.S. technology was used to scan the desert for valuable resources like groundwater, minerals, and petroleum that might attract foreign investors. As part of a $20.7 million project, Egyptians were trained to operate sophisticated U.S. survey equipment. More than 90% of the eastern and western desert has been surveyed by the Egyptian government. The shuttle flight scheduled for this November will provide more data when it passes over the desert.

A $25 million vehicle traffic management system has permitted more

market levels, wasteful, artifically inflated growth in energy consumption will slow. This will leave more of Egypt's oil available for export, and ultimately strengthen the economy.

Q. How effective has the absorption of AID funds been in Egypt?

A. We obligate $750 million a year. Two years ago, the pipeline stood at a high of $2.7 billion. It was reduced to $2.5 billion last year—the first time we've seen a reduction in the pipeline. We expect a further reduction to $2.4 billion this year. And because of cooperation between the two governments, this trend should continue.

There was a period when our projects were slow to absorb appropriated funds. Our first projects in Egypt were large capital-intensive projects: cement plants, telecommunications and generating facilities, grain silos. It takes time to lay the foundation—literally and figuratively. Those early projects have matured.

We must, however, constantly seek projects that can absorb the funds and that are economically and developmentally sound. The funds will be there, and we need to select the most effective projects. That's why it's so important to me that our mission develop a shelf of projects.

Q. What kind of projects are most promising?

A. We have a very attractive portfolio of projects involving basic village, neighborhood, and urban services which allow a large number of Egyptians to participate directly in development.

Transportation projects also offer worthwhile possibilities. We're doing a feasibility study, for example, that should provide us with answers about whether we should upgrade the North-South Road. If you visit Egypt, you will see that the North-South Road could provide more service if it were widened and otherwise improved. However, since almost the entire country lives up and down the Nile, a better road might also increase migration to Cairo.

We're also looking into the feasibility of a ring road around the Cairo metropolitan area.

We're making significant investments in the area of water and sanitation. I think that's very important. It certainly ties directly to health, and is an area where the need is great.

Health, in general, and oral rehydration therapy, in particular, are so important because large numbers of children still die from diarrheal dehydration. Education is another area where we can make a positive contribution. Overcrowding is a problem for Egyptian schools and school construction efforts could be very effective.

Q. In your opinion, what strategy should Egypt map out for the future?

A. The Egyptian government needs to make an even stronger effort to refrain from intervening in the market. It will need to take some politically bold steps, such as reducing subsidies. This will also involve encouraging the private sector, letting energy prices rise to world market levels, and providing incentives for all Egyptians to participate in development.

Leadership committed to economic and social development is vital and I believe President Mubarak provides that. The more we can assist in supporting these efforts, the more effective our development assistance will be. ■

At present, about one-half of Egypt's yearly food needs are imported.

At the agricultural research center in Sandaweel governorate improved sorghum is being developed.

The year following one farmer's successful potato harvest, neighboring farmers expanded their potato production.

and larger vessels to pass safely through the Suez Canal. The radar-guided system is the most advanced in the world.

Research and technology transfer are an integral part of AID's effort in Egypt.

"Egyptian access to Western technology was limited for about 20 years (1956-74)," explains Sherif Arif, AID's project officer for applied science and technology. But in 1974, then-President Anwar Sadat established "Infitah"—an "Open Door" policy—to encourage foreign investment in order to increase Egypt's productivity. This initiative helped bring a broad range of new technology into the country.

The "technology gap" narrowed rapidly with the help of AID-funded training and new equipment. A $26 million oral rehydration therapy (ORT) program aims to reduce the 100,000 infant deaths in the country caused by severe diarrhea every year. The Egyptian program was one of the first national ORT campaigns. It also is the largest in the world. Locally produced ORT packets are distributed through health centers and hospitals. Alexandria's El Shatby Hospital has become an international research center for diarrheal disease.

Training has been the major conduit for transferring technology. More than 96,000 Egyptian professionals and technicians have had AID-financed training since 1975; of these 5,000 were trained in the United States. AID's Peace Fellowship program alone is providing $54 million for some 1,900 graduate fellowships in U.S. universities.

AID's nearly $300 million agricultural portfolio is providing support through research and the transfer of technology and skills. Improved seeds are among the new technologies. In field tests under varying soil and weather conditions, 20,000 farmers trying a new variety of maize seed harvested yields 28% to 91% higher than the national average, depending on the region of the country. Similar tests for other grains using improved seeds produced 65% more wheat, 50% more sorghum, 30% more soybeans, and 50% more rice. Some farmers' yields have actually surpassed the demonstration yields.

Children from squatter settlements south of Cairo attend a school built under AID's Neighborhood Urban Services project. Students used to travel three kilometers to attend school, provided room was available.

Much credit belongs to the national agricultural research system. AID has helped revitalize the system and its operations and train the necessary staff. A $47 million AID project supports four centers that have been working exclusively on adapting major cereals to Egypt's soil and weather conditions.

U.S. technical assistance helps Egypt's industries as well. Under its Industrial Technology Application Project (ITAP), AID is working with the Engineering and Industrial Design Center in Giza to increase industrial productivity and employment. The Georgia Institute of Technology provides technical assistance. Together, the center and ITAP help industries do feasibility and marketing studies, design new products, plan new factories, improve processing, and train workers and engineers.

The center conducts training seminars and conferences, as well as in-plant training. Egyptian industrialists, engineers, and technicians visit U.S. factories and industrial shows as part of the center's activities. It also disseminates information on industrial technologies to help industries make more informed decisions.

Last year, the center worked with some 1,000 Egyptian companies, public and private, large and small. Among the smaller firms were 10 stove manufacturers that had their products designed or modified by the center. Production bottlenecks were identified at seven firms, and three of the companies then asked for the center's help to solve those problems.

These examples are only a small part of the diverse and successful technology transfer aspect of AID's program in Egypt.

Institution Building

Institution building is a key part of several AID projects in Egypt. In many cases, like that of ITAP, efforts concentrate on strenthening the capabilities of existing institutions through training and technical assistance. Some also include constructing new facilities or rehabilitating old ones.

Agricultural production is increasing with support from research institutions, farmer credit, and extension.

"While the research being done is important," says Robert Mitchell, AID's chief for science and technology at the mission, "what is even more important is how it is being done. AID is focusing on improving the management of research and applying it to Egypt's development needs."

Strong institutions promote development. Without them, advances in agricultural technology will not filter down to the people they have been developed to help.

Once improved seeds are developed, the product needs to be made available. Small farmers have faced serious constraints in their access to bank credit to buy farm inputs and equipment to increase their production and income. A service funded by AID through village banks is helping small farmers obtain credit and tech-

Much that AID does in Egypt helps, directly or indirectly, balance the trade ledger.

nical assistance. The project has improved the skills of the bank staffs, streamlined the loan application and processing system, provided additional loan funds, and upgraded bank facilities in 27 participating village banks.

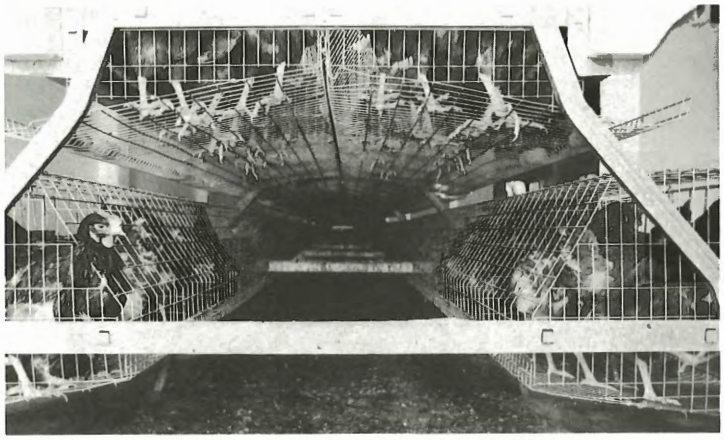
Bordeen's village bank is very popular among local farmers. More than 4,000 farmers received loans from the bank in the last year, and repayment has been an impressive 100%.

In a country where arable land is at a premium, (Egypt's 46 million citizens live on 4% of the country's land mass) loans help villagers increase incomes off the farm. For example, one of Bordeen's residents—who farms a feddan—shows off the new addition to his home.

Through the wooden doorway at the top of the stairs are six long, metal-wire cages called "batteries" full of egg-laying chickens. A $700 loan paid for the batteries and the first 96 pullets. The batteries have significantly boosted his income, or more particularly his wife's income, for village chicken flocks are usually the responsibility of the women of the household. Having paid the loan back with part of the first-year profits, the farmer now wants to raise rabbits as well.

The village banks are also part of a nation-wide rural development program which assists all of the 890 democratically elected local councils.

"During the mid-1970s a group of senior members of the ministries for local government and planning and representatives from the people's assembly realized that local development problems are too scattered and too diverse to be identified and solved through a large centralized bureauc-



Start-up funds for lucrative second businesses like raising chickens and sheep are made possible through village bank loans.

A farmer's wife is among the many who have started egg production businesses in their homes with credit and technical assistance made available by AID.

racy," explains Graham Kerr, one of the decentralization sector's project officers and team leader of the recent sector assessment. "So, they designed a series of local government laws that articulate a decentralized strategy of local development for Egypt." In 1975, Law 52 established popularly elected village councils with appropriate decision-making authority and village executive councils with responsibility for implementing projects selected by the elected councils. The law also stipulated that local authorities could establish special accounts for "local development and services," which are separate from the central budget and do not devolve to the central government if funds are not spent at the end of the fiscal year. The law authorizes the collection of various revenues for the special account and puts all expenditures under the jurisdiction of the elected councils. AID's decentralization sector builds upon this Egyptian legal initiative.

With Law 52 came new and challenging responsibilities for local leaders who had had little opportunity to budget, plan, and manage projects. But with technical assistance and funds from AID, local governments are demonstrating how effectively they can develop their communities.

Part of the decentralization's success is based on creating new private enterprises. U.S. assistance to the Local Development Fund (LDF) of the Organization for Development of Egyptian Villages stimulates private business in Egypt's villages. Capital, technical assistance, and training for LDF operations are provided under AID's decentralization sector program. The program eases the strain on the national budget by decentralizing the administrative and economic dependence of rural communities. LDF makes loans to elected village councils and, through the councils, to private entrepreneurs to establish income-producing enterprises. To date, over 500 loans for more than $14.1 million have been awarded by the LDF. Local contributions have added another 45%, or $6 million, to the investments in village enterprises. The overwhelming successes of some projects have turned quiet, palm-lined rural communities into bustling pockets of economic activity. In Soal, for example, chicken batteries are found everywhere—from living rooms to roof tops. The project clearly will have an impact on future generations in this village.

Ismail Mohamed el Baheri has 26 chicken batteries producing an income of about $40 a battery a month. As the secretary of the village council put it, "He earns more than some high-level officials in Cairo, who may bring in about 200 Egyptian pounds (approximately $170) a month."

The project also set an example for nearby villages and residents with resources to start their own business but who were unwilling to risk a new venture.

As AID's Office Director for Decentralization John F. Roberts notes, "You can see how successful these projects are in the faces of the people whose lives have been changed."

"We have hope," said one villager, "because we know we can provide for ourselves and do a better job of it than anyone else."

Although every local council in Egypt is involved in the decentralization sector, there is still work to be done. AID and Egypt are building a foundation of basic services and knowledge of entrepreneurial principles for continued private sector growth.

Private Sector

Although the public sector has dominated Egypt's industries since the 1950s, AID's programs have led to greatly enhanced private sector growth opportunities.

Egypt's "Open Door" policy set the stage for attracting foreign private investment. Law 43 is the cornerstone of this policy. It encourages joint ventures, prohibits nationalization and confiscation, allows a minimum five-year tax grace period, exempts machinery and equipment used by approved projects from custom duties, and fully protects investments under international investment agreements. Since the law was enacted in 1974, the private sector's share of the economy has risen by about 5%.

AID works with government officials to establish policies that encourage private growth, and helps repair or build the infrastructure necessary to attract private investment.

"In order for Egypt's development plan to succeed," says Mission Director Michael Stone, "the country is going to have to be electrified, and businessmen must have a reliable telecommunications system in order to do business with the rest of the world."

An AID-funded telecommunications project provides for replacement of eight phone exchanges in Cairo and Alexandria. It also has helped modernize the inter-office junction system in Cairo, easing the frustration of getting calls through the overloaded circuits.

AID has contributed $720 million to help build four major power plants which when completed will generate as much power as the Aswan High Dam. Hamlets that have not been reached before are being electrified as others are assured more consistent coverage. With 70% of its villages electrified, Egypt is well on its way to its goal of 100% by 1990.

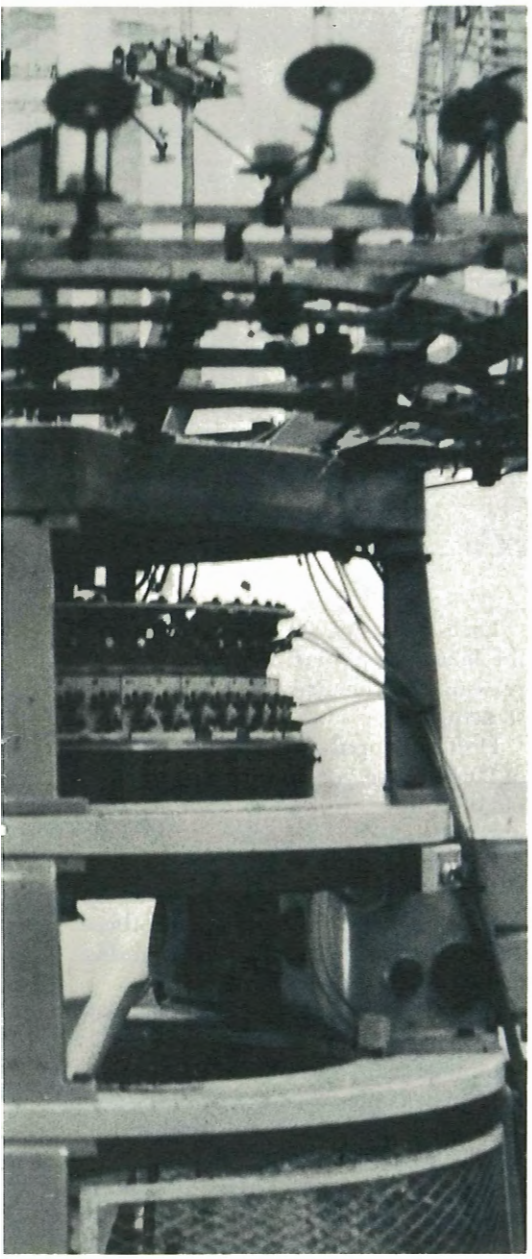
The Commodity Import Program (CIP)—AID's largest grant to the country—finances Egypt's purchase of capital equipment, basic raw materials, goods, and services from U.S. firms. It has made available the foreign exchange necessary to build more and better roads, medical and educational facilities, food processing plants, telecommunications facilities, and other manufacturing industries.

AID has obligated $2.8 billion to CIP since it began in 1975. Over 2,800 letters of credit were issued to U.S. companies which have received about $2.2 billion for their products. Under the CIP umbrella, approximately $800,000 a day is spent procuring goods and services from U.S. suppliers to meet project demands.

AID's Production Credit Loan program, totaling $68 million, enables Egyptian businessmen to establish, modernize, and expand their companies. This follows earlier credit efforts where $137 million was made available to the Egyptian private sector through the CIP. Long-term investment funds were made available also through the Development Industrial Bank.

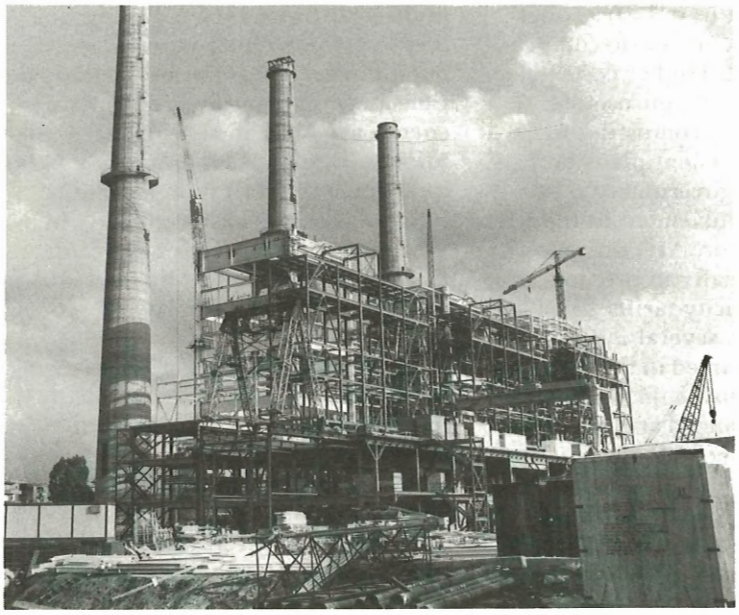
Since AID activities began 10 years

ago, changes can be seen. There are now 15 joint Egyptian/U.S. manufacturing ventures. Ten years ago, 10 U.S. banks had branches in Egypt. By 1983, there were 70 U.S. and foreign branches—an important indication of Egypt's potential. U.S. businesses have invested $240 million in Egypt, mostly in the banking and oil industries at present. The AID-funded private sector feasibility studies project encourages private investment by offering U.S. companies incentives to investigate doing business in Egypt. One incentive is partial reimbursement for their initial market surveys.



Egypt's goal is 100% electrification by 1990.

Mohammed Nounou (above) streamlined his operation to become Egypt's leading producer of fabric for traditional garb. He replaced outdated equipment with modern machines able to perform more tasks in less time and space, and with less supervision (left). Below, the Shoubra El Kheima power plant, one of the largest construction projects in the Middle East.



Policy Dialogue

An essential part of the process of economic development is continual policy evaluation.

Raising energy prices and slowing the population growth rate are two areas in particular that have been identified by the United States and Egypt as priorities. Long-term goals have been set by Egyptian and U.S. officials.

As an important producer and exporter of oil, Egypt has been able to keep pace with the energy demands of its population. That pace, however, is slackening as the number of users—including the expanding industries—continues to increase at a rapid rate.

"Energy consumption is growing by about 13% a year," explains John Hunt, AID's power systems group manager. The high and rapidly rising level of domestic energy consumption limits the volume of oil available for export and may lead to a serious decline in future exports. To forestall such a decline, AID's policy discussions with the Egyptians have centered around bringing energy prices up to world market value, reducing the indirect government subsidy. The average Egyptian price per kilowatt-hour is one- and one-half cents, compared to the world market price of six cents. Industrial fuel oil, diesel, kerosene, and natural gas are even more under-valued—less than one-eighth of their world price equivalents.

Low energy prices also tend to induce investment in industries that would otherwise be unable to compete, according to Hunt. Higher costs tend to reduce or eliminate misuse of energy, and prompt companies to tailor their development plans to coincide with the government's. Because of AID's involvement in the electric power sector, AID officials have sought especially to promote increases in electricity tariffs. During the past two years, several modest increases have occurred in these tariffs. However, most petroleum product prices have not changed at all in recent years and still reflect the low levels of world prices that prevailed before the world energy price increases of 1973 and 1979/80. Egyptian officials recognize the need for further increases and World Bank and International Monetary Fund officials have urged a multi-year timetable for raising domestic prices to international levels, but a timetable has not been adopted. Considering the years of inexpensive energy available to all Egyptians, as Mission Director Stone cautions, "You can't expect to turn it on a dime."

Some progress has been made in slowing Egypt's population growth. Egypt's population growth rate, which peaked at 3.2% in 1976, has slowed to 2.7% in 1983.

Yet Egypt's population is increasing by 100,000 a month; 1.2 million children are born every year. At present growth trends, Egypt's population will top 65 million by the year 2000.

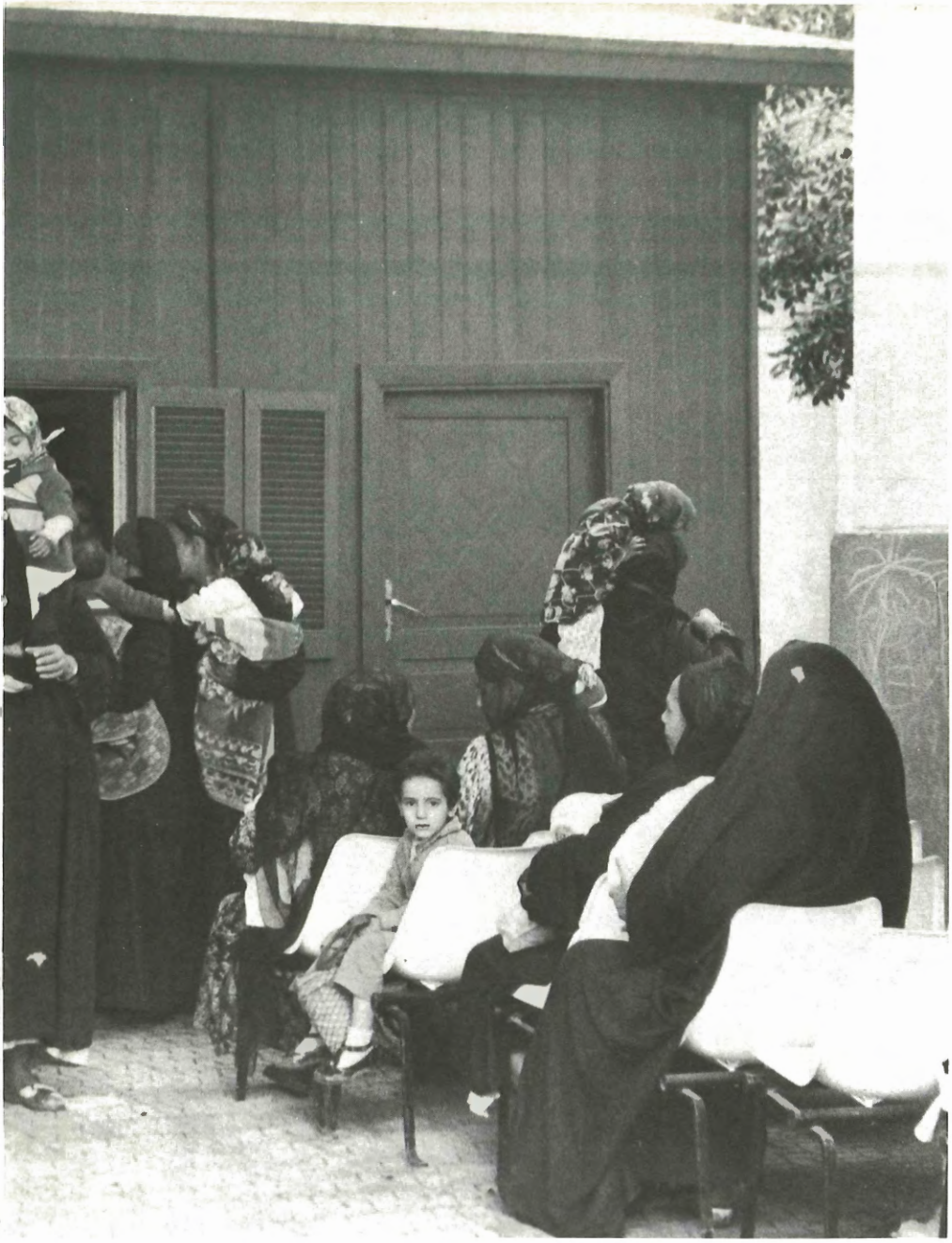
President Hosni Mubarak publicly addressed over-population, calling it "*the* problem of problems."

Each year, 400,000 new people enter the labor force, placing additional pressure on the already low wage structure.

Half the population is under the age of 20; 40% are younger than 15 years old and are still financially dependent upon the adult population.

Policy dialogue and AID-funded population programs administered by Egyptians have helped deal with these population pressures. An AID-funded presentation called "RAPID," an acronym for Resources for the Awareness of Population Impacts on Development shows what the future holds for Egypt if population and economic trends continue along predictable lines. The presentation has helped heighten official and public awareness of the problem.

AID is also providing funds for 3,500



Policy dialogue has helped deal with population pressures.

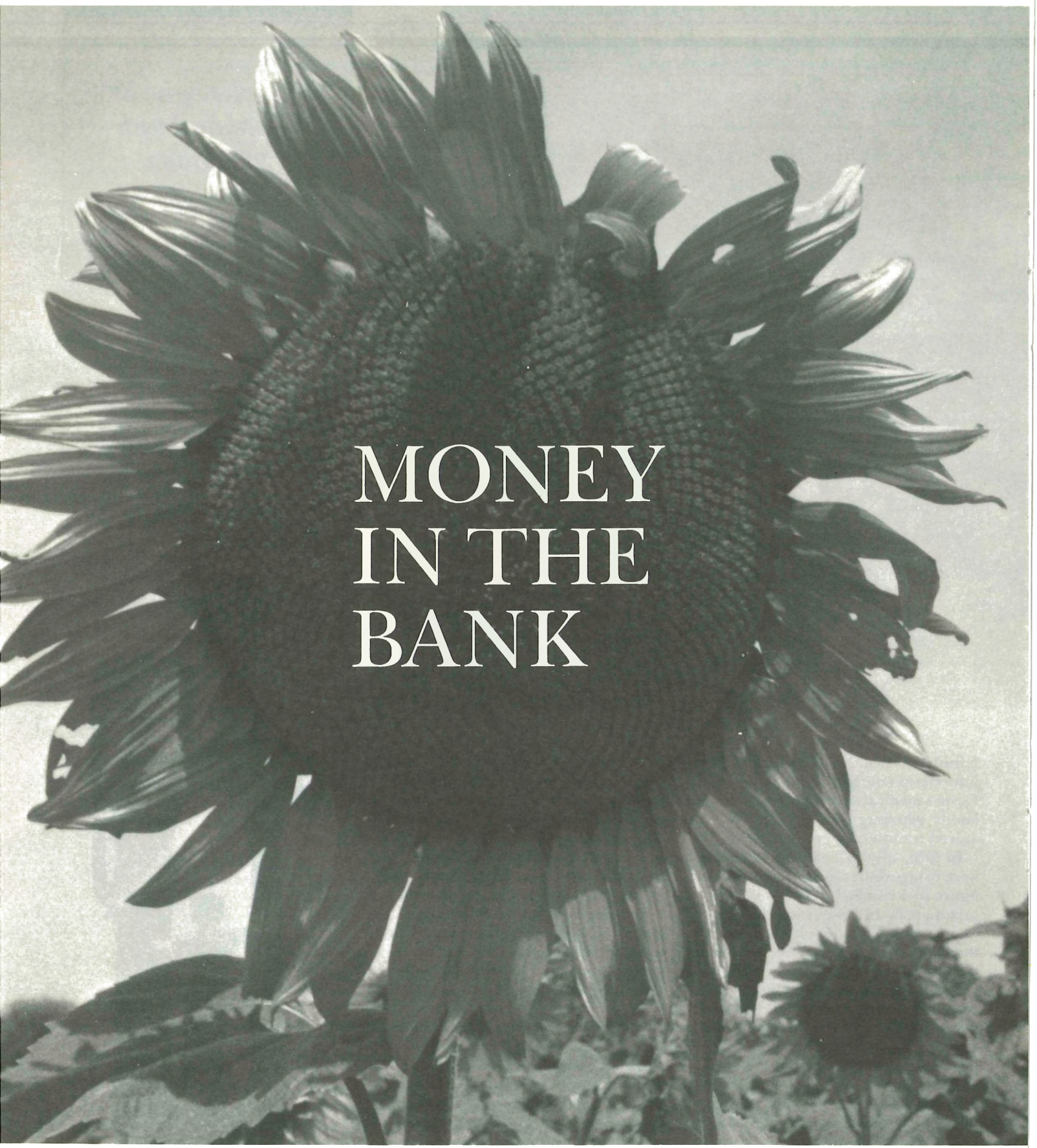
At the Misr el Kedima Maternal-Child Health Center, mothers can receive training in oral rehydration therapy and proper nutrition, as well as family planning assistance. The population logo (below) is commonly seen on cards, calendars, and posters.

ministry of health clinics which offer information on family planning. Egypt's medical schools recently added family planning techniques as required training for graduation.

In 1976, only 16% of married couples were using contraception. By 1983, that figure had climbed to 28%—45% in urban areas. In lower Egypt, 50% of women who have two children say they do not want any more, according to a recent survey. Analysts predict that if these trends continue, the population growth rate could be reduced to 2.4% in three to four years, allowing more Egyptians to feel the positive effects of economic development. Through 1982, AID contributed $67.4 million to Egypt's family planning efforts. The allocation for 1983-1986 is $102 million.

The power plants, grain silos, and telephone towers are visible symbols of the technical progress made over the past 10 years with AID's help. They have contributed to a better life for millions of people. By introducing new technology, improving institutions, mobilizing the private sector, and continuing policy dialogue, AID is helping Egyptians continue to develop the skills and resources they need to support a self-sustaining economy. ■

James F. Bednar, former editor of Horizons, *now is special assistant in AID's Office of Business Relations. Suzanne Majors is special assistant to AID's Assistant Administrator for the Bureau for the Near East. Bednar and Majors visited Egypt in January.*



MONEY IN THE BANK

An AID loan program in Kenya stretches U.S. development dollars while spurring private sector growth.

By Judith Ann Knudson

In the shadows of Mt. Kenya, northeast of Nairobi, hundreds of small farmers are growing sunflowers. Until a year ago, sunflowers were a novelty to farmers in Kenya's Karaba and Meru regions. When I visited the Oil Crops and Allied Foods Co., Ltd. (OCAF) in January 1984, I saw mounds of fresh sunflower seeds drying in the scorching sun. Nearby, a cow was munching discarded seeds. Almost automatically I stooped down, picked up a seed, hulled it, and tossed it into my mouth. Eyes popped open. I realized that these Kenyan farmers had never seen a human being eat a sunflower seed. Turning to Mr. Geshukia, Chairman and General Manager of OCAF, I said, "Do you know what the mark-up is on sunflower seeds if you want to package and sell them as snacks?" We then discussed processing and packaging methods, and the market potential of sunflower seeds for export and in hotels in Nairobi, particularly those frequented by Western clientele.

OCAF organizes small farmers to grow and harvest oil seeds, particularly sunflowers. The farmers buy high quality hybrid sunflower seed and fertilizer on credit from OCAF, receive technical advice from the company's field staff on sunflower production, and at harvest, sell their produce to OCAF for transport and resale to East Africa Industries, Ltd. (EAI) which produces sunflower oil. EAI agreed to guarantee purchase of all OCAF seeds in an effort to substitute previously imported palm oil and fats with locally produced oil, saving a potential $34 million a year in scarce foreign exchange. (An EAI study in 1981 showed Kenyan milling capacity utilization at only 30%, supplying 10% of edible vegetable oil consumed.) Other benefits expected are higher incomes for about 6,000 small farm families, improved local diets because of the availability of quality sunflower oil, and supplemental feed for cattle.

The purchase by OCAF of equipment, storage facilities, raw materials, supplies, and operating expenses was made possible by a loan of $178,500 from AID. This amount was matched by the Kenya Commercial Finance Corporation (KCFC), a local, essentially private, financial institution. AID's Bureau for Private Enterprise, working with KCFC, is the instrument providing medium- and long-term credit not otherwise locally available to Kenyan entrepreneurs like OCAF.

Kenya Commercial Bank (KCB), purchased from the British in 1970, is wholly owned by the government of Kenya, but it is not subsidized and it pays regular dividends. The Kenya Commercial Finance Company is a subsidiary of KCB. As the parent corporation, KCB guarantees AID's loan to its subsidiary.

PRE's $2.5 million loan to KCFC is matched by $2.5 million in local currency from KCFC's own funds. The $5 million fund is earmarked exclusively for on-lending to small- and medium-sized private Kenyan agribusinesses and light manufacturing enterprises. The AID/KCFC loan agreement was signed in January 1983. As of April 1, 1984, nearly one-third of the $5 million had been disbursed to 18 sub-borrowers.

All are small enterprises located in rural areas. They include agribusinesses such as small milling operations for corn and other cereals, sugar cane hauling services from farm to factory, tractor leasing to small farmers, distributors of animal feeds and farm implements, and village bakeries. Light industrial loans include those for a new manufacturing facility for multi-use adhesives, and another for expansion of a plant for insulated electric cables.

Kenby Cables is one such sub-borrower. It is a small firm that manufactures about twenty types of coated copper cables for residential and industrial wiring. The company is located just outside of Kisumu, a sprawling, active agricultural and trading center close to both Uganda and Tanzania via Lake Victoria. Kisumu is also the last sizeable rail depot on the Mombassa, Nairobi, Uganda railroad.

Kenby's founder, Mr. K. S. Patel, who was in the hardware business for 30 years, saw that as Kisumu grew in size, the demand for cable would grow, too. He began in a small way to produce a few of the types most widely used. To satisfy larger mar-

Sugar cane haulers are under pressure to deliver as much cane as possible to the factory, especially during months when the cane's sugar content is particularly high.

kets, Mr. Patel eventually sought funds from AID/KCFC to purchase additional extrusion machines for the relatively new plant and to stock up on raw materials—copper wire and coating compounds—to avoid possible supply disruptions. The additional capitalization also allows Kenby to maintain sufficient supplies of finished wire of the types in greatest demand.

Mr. Patel keeps up with the latest developments in his field, like optic fiber technology, and is cognizant that his plant can be further automated. But, because labor in Kisumu is plentiful and inexpensive, his operation remains more labor-intensive than technology could allow.

There have been some quality control and pilferage problems, but work assignments were juggled, and guards hired. The plant employs about 25 people, plus additional help for special orders. It thus creates jobs and provides technical skills training for local laborers. Finished goods are sold locally and, with increasing frequency, transported to Nairobi where they are sold by distributors as well as exported to neighboring Sudan and Somalia. Distributors get a variable discount on orders according to size. This sales incentive has proved successful as shown by higher order levels from central Kenyan industrial areas. Kenby should also share in renewed trade with nearby Tanzania and Uganda now that these borders are again open as a result of mutual trade negotiations concluded last Spring.

AID's borrowers, such as KCFC, as well as sub-borrowers, like Mr. Patel, are charged fixed commercial market or near-market rates. As a result, the United States is getting more development impact for its dollar on several counts. On the one hand, principal plus interest of 8½% to 13½% is returned to the U.S. Treasury from PRE's borrowers, a return approximately equal to the cost of these funds to the U.S. taxpayer. At the same time, the U.S. also gets more *leverage* for each dollar spent as funds committed to AID development goals are matched by AID borrowers such as KCFC.

The KCFC sub-loans range in term from four to six and one-half years. Thus far 78% are for new businesses, the remainder for expanding enterprises.

This private sector loan in Kenya is part of a larger AID effort to increase the role of indigenous private sectors in bringing about self-sustaining, long-term growth and stability in many countries of the developing world.

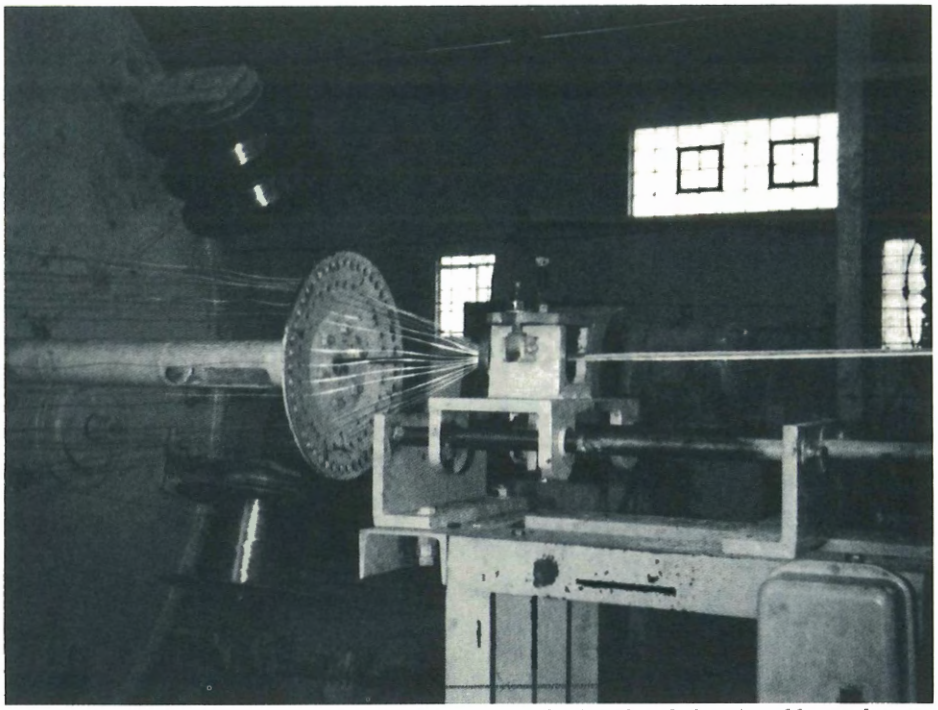
Ways in which increased private competition may achieve a number of development goals, including that of opening tight government-controlled industries, is exemplified by another sub-loan from the AID/KCFC fund.

Mumias Sugar Co., 40 miles northwest of Kisumu and about 30 miles from the Ugandan border, is surrounded by 8,000 to 10,000 privately owned fields. The plots, each about four acres, are all within a 20 mile radius of the factory and supply it with sugar cane.

Mumias Sugar Co., a government-owned facility, can produce 6,000 200-lb. bags of granulated sugar each 24-hour operating day during 10 months of the year. The plant is closed the remaining two months for maintenance and repair.

Ima Hauliers, the sub-borrower used in this example, is one of the few private sugar cane haulers under

Ima Hauliers, a private sugar cane hauler, purchased additional equipment with an AID/Kenya Commercial Finance Corporation loan.



Kenby Cable's founder predicted a growing market for insulated electric cables and expanded his operation.

contract to this government-owned plant. The company has 31 tractor/haulers as well as 2 tractors with winches to service breakdowns and to pull heavy loads from the fields to the main road during the rainy seasons. Each tractor/hauler in use carries about 30 to 35 tons of cane each 16-hour day to the factory, undergoing service, maintenance, and repair at night. Ima is paid twice a month on a tonnage-of-cane-delivered basis. Under its contract, Ima is required to service all, even the outermost fields.

Mr. M. C. Bhayani, a company director, estimates that the useful life of a tractor/hauler is two to two and one-half years, after which they are sold at half price. The equipment uses about 100,000 tires a year, all supplied by Firestone's Nairobi plant. Most of the tractors are manufactured by U.S. firms—Ford, Caterpillar, and John Deere.

An AID/KCFC loan for about $75,000 helped pay for additional equipment needed. Ima Hauliers paid more than half the cost and provided working capital.

All farm services like seed supplies, planting, harvesting, and hauling harvested cane to the factory are arranged through Mumias Sugar Co. Individual farmers receive cash for their cane after fees for these services have been deducted. Farmers have sometimes complained that they are not paid fairly for their crops. Actual charges for each service and the method by which rates are determined are not disclosed by Mumias Sugar Co. This practice raises some serious questions. Mumias Sugar Co., however, is known as the most reliable and prompt payer to farmers and service operators alike in Kenya's sugar industry. The existing system nevertheless leaves room for service suppliers, and for Mumias Sugar Co., to earn excessive profits. It has been inferred that the company has refused farmers who wish to do their own cutting and hauling. Mumias' position is that control over all services is the only way to ensure sufficient and timely supplies of cane for the factory.

The synergism of contracting private competing firms as service suppliers to an otherwise totally government-owned and controlled industry, however, helps to open up financial records so that Mumias sugar farmers eventually may better understand the service cost structure, how this affects their income, and what a fair return on their crops should be. Furthermore, competition is stimulated. Creating a market in which several companies compete translates into more efficient and less costly services.

All sub-borrowers from the AID/KCFC fund are required to keep written records for inspection by KCFC. An additional AID grant for $250,000 will expand training of KCFC staff in business advisory services (BAS), improve the Bank's agribusiness credit evaluation capacity, and expand services at KCB Group regional and branch offices. The business advisory services help borrowers—frequently "mom and pop" operations—modernize their management control, operating, and accounting practices.

Should banks be providing BAS?

Views differ on this issue. Some say that whereas small business advisory services are definitely needed, it is not a bank's usual responsibility or function to provide them. In fact, BAS is costly and time-consuming.

On the other hand, as previous experience shows, once entrepreneurs pay back loans and are no longer required to keep formal records, they continue to do so. What's more, they become loyal, long-term customers of the bank. With better management and bookkeeping skills to trace the flow of inputs and outputs, many small firms are able to expand their operations and develop into strong, efficient, medium-sized enterprises.

The AID/KCFC loans bring new full-time jobs—at least 347 are expected from the first 18 sub-loans—and increased incomes to rural communities. It's estimated that as many as 128,000 rural Kenyans will benefit indirectly from $1.4 million in investment as of April 1, 1984, only $700,000 of which was provided by AID. Benefits will accrue from new cash crops, improved growing techniques, and farm-related services. Furthermore, many others will have an opportunity to learn new skills in manufacturing, tractor and hauler maintenance and repair, chemical compounding, bakery operation, and marketing. ■

Judith Ann Knudson is an investment officer in AID's Bureau for Private Enterprise, Office of Investment.

SERPENT'S DISEASE: FORGOTTEN DISEASE OF FORGOTTEN PEOPLE

Transmitted through contaminated water, Guinea worm disease is a painful "fact of life" that can be changed.

By Sally E. Coghlan

When the people of Israel were wandering in the wilderness, becoming impatient and angry, the Bible says, the Lord sent fiery serpents among them. The serpents bit the people and many died. Centuries later, Serpent's Disease still plagues millions of people every year. Serpent's Disease is another name for Guinea worm disease (Dracunculiasis), a physically debilitating parasitic infection. Eradicating the disease is an objective of the United Nations International Drinking Water Supply and Sanitation Decade (1980-1990). According to G. Arthur Brown, Deputy Administrator of the UN Development Program, eliminating the parasite from affected areas will be a measure of the Decade's success.

For hundreds of years, Guinea worm outbreaks occurred across a wide swatch of territory stretching from West Africa and the Middle East to India. Guinea worm disease was present in North America during the slave trade, and wasn't eradicated in the southern parts of the Soviet Union until the 1930s. It is seldom fatal—and then usually as a result of a secondary infection. It occurs in relatively remote rural areas, so the actual impact of the disease has been seriously underrated. Guinea worm disease has been dubbed "the forgotten problem of forgotten people."

Dracunculiasis is a waterborne disease transmitted only through contaminated drinking water. The threadlike round worm itself, Dracunculus medinensis, ranges in length from 30 to 120 centimeters (12 to 48 inches). At any time during its eight to 10 month voyage through the body cavities and connective tissues the worm anchors itself in place until it emerges, usually in the ankle or lower leg. The worm creates a lesion which ruptures on contact with water. When that happens, one to two million larvae are released into the pond, stepwell, or pool which the infected person entered to bathe or collect water. Thus, the whole tragic cycle is set in motion again.

Some say that Guinea worm could be the second disease (after smallpox) to be eradicated throughout the world. This appears overly optimistic. It is difficult to locate cases in remote communities. There is no specific means for control nor is a vaccine available as was the case with smallpox. Any community once declared "clean" can easily be re-infected by a single

person whose infection may go undetected for as long as 10 months. Likewise, a member of a clean community may drink from a contaminated water source outside his village and, upon return home, contaminate his own village water supply.

Even when a well-planned eradication program is in place, retrogression can occur. For example, in 1975, Idere, in the Oya state of Nigeria, was connected to a clean water supply. By 1979, the village was virtually free of the disease. Prosperity, however, brought new people to the village who overtaxed the water system. Construction of new roads, built to better serve the growing community, damaged the water mains. The taps of the community went dry, the villagers returned to ponds for water, and the incidence of Guinea worm shot from zero to 40%.

Dracunculiasis impedes development. It threatens the health of an estimated 786 million adults and children in rural Africa, India, and the Middle East. Agricultural communities suffer the most because outbreaks of the disease coincide almost exactly with the peak of the growing season. This significantly reduces agricultural production. Economic losses from the disease are estimated between $56 to $277 million a year, based on estimates of 10 to 48 million cases a year.

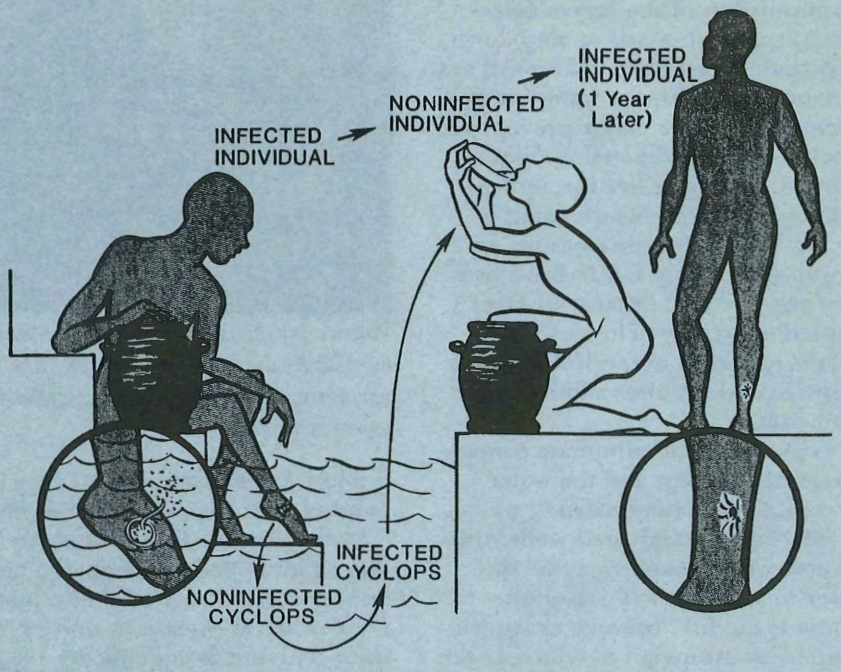
"It is necessary to emphasize how grossly underestimated the impact of this incapacitating disease is," comments Alfred Buck, a tropical disease adviser in AID's Office of Health, who recently returned from the Sahel region. Recent studies in one area, Buck says, "show that for a family of 10 living at the subsistence level, the estimated loss during the planting or harvesting season when the disease is at its peak is approximately $1,000."

In countries like India or Nigeria, Guinea worm disease peaks during the dry (harvest) season when the shallow water in wells and ponds becomes infected. In the Sahel, it peaks during the rainy season when standing puddles become contaminated. The situation is exacerbated when thirsty workers drink from these puddles. Ironically, uncontaminated wells are often available, but go unused because of their inconvenient locations.

The Geographic Distribution of Dracunculiasis

Source: R. Mueller, Advances in Parasitology, 1971.

Life Cycle of Dracunculus Medinensis



- *The mature female worm pierces the skin of the lower leg causing an ulcer.*
- *When the ulcer is in contact with water, larvae are discharged into the water.*
- *The larvae infect Cyclops, a small crustacean.*
- *The water, contaminated with the infected Cyclops, is consumed.*
- *The ingested larvae mature in humans in one year.*

Source: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control.

The traditional way to treat Guinea worm disease is to laboriously extract each worm as it emerges from the skin by rolling it—a few centimeters each day—onto a small stick. This procedure is accompanied by various treatments to prevent infection. Local potions and cures are so numerous that in India an often-quoted proverb states, "one Guinea worm, a thousand remedies."

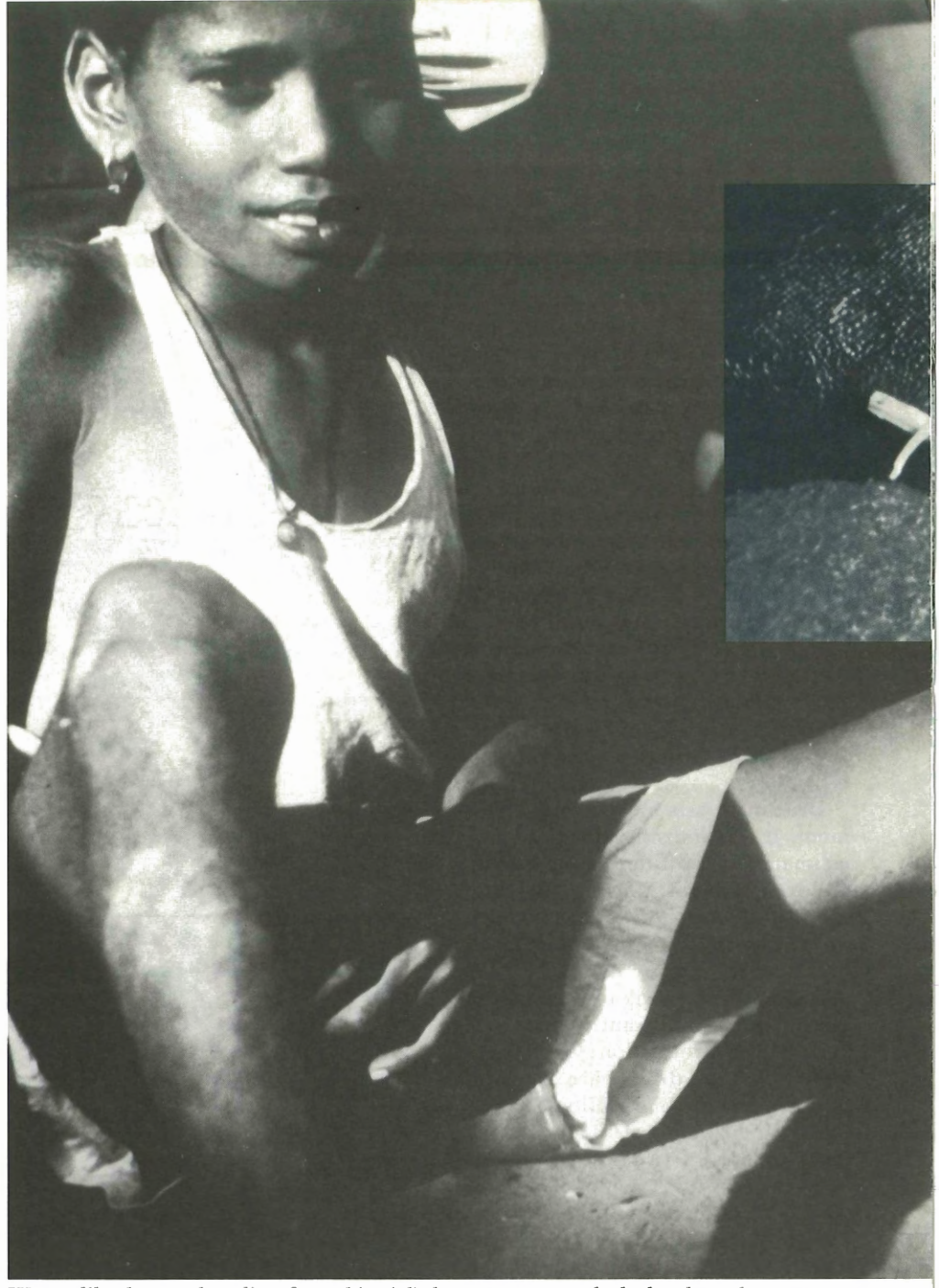
In recent years, chemotherapy has effectively improved the treatment of the disease by hastening the worm's expulsion. Thus, inflammed lesions and ulcers heal in an average of four to 17 days instead of the one to two months it took previously.

Until the ultimate goal of clean piped water is reached, prevention is the best protection—and the most feasible. There is no cure for Guinea worm although research is continuing. Drugs that speed up the extrusion of the worm are used only eight to 10 months after the initial infection takes place. There is no vaccine for immunization, early diagnosis is not possible, and there is no known drug treatment for suspected cases.

Transmission of the larvae takes place in seasonal ponds or step-down, rather than closed wells. It also will not occur in large bodies of water, or in a heavy current. The major preventive measures being promoted are either boiling or seiving water through tightly woven cloth before using it. The most cost-effective measure, by far, would be to use DDT. But this is out of the question because of DDT's cumulative toxicity. The pesticide Abate is generally successful, but it is expensive and requires subsequent treatments.

It is preferable to eliminate contact between the patient and the water source. Rehabilitating existing wells, or replacing contaminated wells with new bore or tube wells may be the answer to continued re-infection.

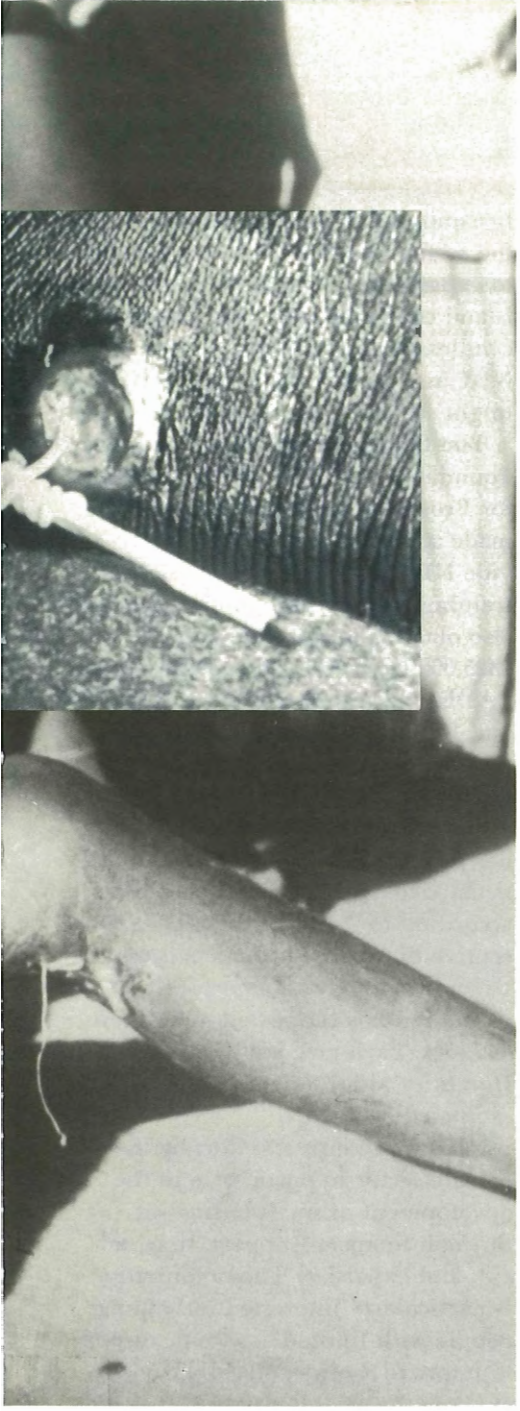
India is the first country to launch an intensive campaign to eradicate the disease. In 1979, 3,000 cases were reported, indicative of the known underreporting of the disease. A nation-wide surveillance system was initiated in 1981. When suspect areas were visited two years later, 5.9 million people were declared at risk. ("At risk" meant that at least one active case was found.) A year later, 29,000 Dracunculiasis cases were officially recorded.



Worms like the one dangling from this girl's leg can re-enter the body where they eventually die and are calcified. The traditional method of extracting the worm by wrapping it slowly around a matchstick (inset) can lead to an ulcerating infection if the worm is broken.

India, also the first country to launch a stepped-up campaign against smallpox, predicts it will eliminate Guinea worm disease in the seven states where it is endemic by 1986.

Identifying the endemic areas and those contaminated by Guinea worm is the first step toward controlling the disease. Contaminated water will be treated with Temephos (Abate), considered an effective pesticide with low human toxicity. The easily identifiable disease cycle and the fact that it's transmitted solely through drinking water makes Guinea worm a suitable target for health education campaigns. The Indian government considers these campaigns the most important part of their program. Health workers and the media will play a significant role in this educational effort. The campaign will cover the disease's cause and how it is transmitted, and will outline the major preventive steps that individuals can take to combat it. Also under way are plans to train local personnel in managing and maintaining water systems.



India recognizes that if the vicious cycle is to be broken, it must be done through the rural population's commitment to stop drinking contaminated water and re-infecting ponds.

The UN Decade and the start of the well-designed eradication program in India have spurred international awareness of this debilitating parasite. AID and the National Research Council's Board on Science and Technology for International Development co-sponsored a workshop in 1982, assessed the problem and suggested intervention strategies, options for monitoring and evaluating programs, and priority areas for research. The next step, according to "Opportunities for Control of Dracunculiasis," the report published in 1983 by the National Academy Press, "is to start implementing the control activities" most suited to the needs and resources of developing countries where Guinea worm is present.

Two years have elapsed since the workshop and we are fast approaching the mid-point of the Decade. What progress has been made against this dreaded disease?

Public health authorities in all countries with reported or suspected cases of Guinea worm disease have been urged to assess the extent of the problem at the national level, select strategies for control, and prepare a written plan of action. UNICEF, WHO, and AID have begun to assist interested countries to survey the problem and to develop national action plans. The Centers for Disease Control in Atlanta, GA will gather and analyze international surveillance data. So far, Nigeria is planning a national meeting on Dracunculiasis in 1984 to study the extent of the problem and to seek solutions. WHO and UNICEF will help support the meeting.

In Upper Volta, several organizations are funding a study to survey the problem and determine whether health education efforts are necessary to reduce the incidence of Dracunculiasis if safe drinking water is provided. The organizations funding the study include WHO, the Organization for the Coordination and Cooperation in the Struggle against the Great Epidemic Diseases, and AID.

WHO's African Regional Office sent a consultant to Togo, Benin, and the Ivory Coast in 1983. An unofficial report by Togo's Division of Epidemiology says that about 444,000 of the country's 2.8 million inhabitants had the disease during 1982, resulting in an estimated loss of 40 million work days among the labor force.

In Niger, a WHO team plans to combine survey work on both Guinea worm and schistosomiasis, another water-related parasitic disease.

UNICEF is helping Uganda use the Dracunculiasis eradication plan to chart the progress of their program to provide clean drinking water. Uganda is providing protected water sources first to Dracunculiasis-endemic villages.

As interest in this effort grows, other countries are looking into ways to tap existing or planned projects, and several private voluntary organizations plan to participate in controlling Guinea worm disease, according to Peter Bourne, director of Global Water, the U.S. support group for the UN Decade.

Guinea worm has been tolerated as a "fact of life" for centuries. Now that research has connected the disease with drinking contaminated water, it is apparent that inexpensive, simple preventive measures can combat this disease. Long-term nutritional and social benefits, too, will accompany the obvious economic gains. With support generated by the UN International Drinking Water Supply and Sanitation Decade, coupled with the global efforts now underway following the 1982 workshop, there is a cautious optimism that Serpent's Disease may someday be eliminated. ■

Sally E. Coghlan, formerly with the WASH Project, is now information director for PRITECH (Technologies for Primary Health Care) in AID's Office of Health, Bureau for Science and Technology.

Suggested Reading

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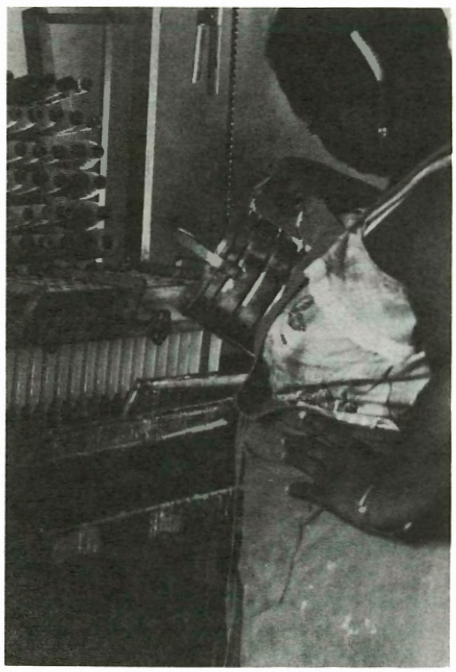
CASHING IN ON CAPITAL IDEAS IN DOMINICA

Enterprising Dominicans get a foothold on the future with the help of an AID-funded foundation.



By Dolores Weiss

When Hurricane Allen lashed into Dominica four years ago, power lines were strewn about and for weeks slim, white candles were the major source of light after the sun set. However, the only candles available were imported, and soon the supply dwindled.

In a country with a population of 80,000 and where hurricanes and power outages are not unusual, there is a substantial need for candles. To capitalize on that need, a half dozen young people came together with the idea of starting a local candle factory. But they had no equipment and no credit—just an idea, a willingness to work, and the National Development Foundation (NDF) of Dominica which AID funds.

With the foundation's help, the enterprising youths were able to obtain credit, buy equipment, find a wax supplier, and start a candle factory. The group now includes a dozen young men and women and is the sole producer of candles on Dominica. Their plans include moving to a new facility where they won't need to take the hot wax kettle off an outdoor fire and pass it through a window to the casting machine. They also hope to expand their market to nearby island countries and make colored candles for the holidays. Without NDF assistance, the young people might still be unemployed.

The Pan American Development Foundation (PADF), and Partnership for Productivity International (PfP) made an agreement in 1981 to provide NDF with technical assistance, training, and overall guidance. NDF also obtained grant assistance of $325,000 from AID, of $102,000 from PADF, and $9,000 from PfP. PADF and PfP also assist other development foundations throughout the Eastern Caribbean.

Since its start in Dominica, NDF has provided credit and technical assistance to over 200 small businesses, according to Anita Bully, NDF executive director. Through this assistance, the private, non-profit organization has supported more than 445 jobs. Each new job helps reduce Dominica's high unemployment rate, estimated at 15-25%.

NDF represents an effort by the private sector to participate in the development of small businesses through financial support, time, talent, and expertise. The organization is particularly interested in helping people with limited economic means to improve their standard of living, explains Bully. Although AID is the principal donor at this time, the private sector is expected to become the main source of funds for the program. The foundation has obtained tax concessions allowing contributions to be tax deductions for donors. The board of directors includes members from both the private and public sectors who are willing to volunteer their time and experience to promote the development of small businesses.

Bully defines a small business enterprise, for the purpose of obtaining assistance, as one with assets up to $25,000. It may be owned by one or more persons and employ not more than 20 persons.

The NDF of Dominica works pri-

Extending loans to "hucksters"—women who purchase produce for resale in local markets—was a risk that paid off.

marily through a loan guaranty mechanism. It concentrates its guaranties and accompanying training and technical assistance on projects that demonstrate potential for serving Dominica's broad development objectives. Accordingly, the project should create new employment, use local raw materials, produce products of value to the community, stimulate exports, or reduce imports. Another important objective is that the project facilitates opportunities for women to operate small businesses.

"The business community in Dominica recognized that for real progress, we must have a larger productive sector to generate the wealth necessary to build our country and to ensure a sound future for all Dominicans," explains Phillip Nassief, a prominent local industrialist and founding member of the NDF board of directors. "We recognized that in our midst, we have a core of dynamic young people with potential to make a contribution in development if only they can obtain some additional capital and training." NDF arranges for the necessary capital and training.

The small businesses receiving NDF assistance do not qualify for normal commercial loans from a bank, says Bully. When an entrepreneur satisfies the foundation that he will be able to manage the business and pay back the loan, NDF arranges for credit with one of four local banks or the government-owned Agriculture, Industrial, and Development Bank.

The foundation does not give loans directly to the client. Instead, it deposits its funds in one of the cooperating banks, the bank issues the loan, and the client repays the loan directly to the bank. "One of the benefits of the program," Bully points out, "is the training which gets clients used to dealing with a commercial bank. We also emphasize meeting deadlines so that in the future, the entrepreneurs can acquire loans on their own."

During 1983, the foundation received 320 applications and approved 135 loans valued at $360,000. The loans assist such enterprises as home production of uniforms to carpentry to welding. An unemployed factory manager with a talent for working with straw, for example, borrowed $1,850 to set up a handicraft shop. She now employs two others. In three months she repaid $1,000 of her loan. With a loan of $14,705 from NDF a man bought a cement block making machine. He now employs 14 people and makes four-inch and six-inch blocks used in building construction. To help develop the island's farm marketing system, the foundation's directors authorized a $1,400 loan to a "huckster"—a woman who purchases produce for resale in the local market and for sale on other islands. Since then, 17 more loans have been approved for hucksters.

Although Bully says the loans are very high-risk, she is proud that to date only "four loans have been written off." She attributes this success to the field officers "training clients in bookkeeping, marketing, and management." Field officers visit the client and start training and advising him four to six weeks before he gets the loan. In the business' start-up phase, field officers continue to visit their clients regularly—at least twice a month. Assistance can include everything from procuring raw materials to marketing and keeping the financial records.

To reach a wide variety of persons, in 1983 the foundation visited 23 out of 31 village councils throughout the country. NDF representatives acquainted the councils with the program's purpose and explained how enterprising people in the community could receive assistance. Following those meetings, 222 of the 320 applications received were from villagers.

Although at first farmers were not among NDF's clients, the foundation has introduced a program to benefit banana growers. With the assistance of the Dominica Banana Growers Association, the foundation is making credit available for private packing sheds and procuring sleeving to ensure that bananas which are exported are of the highest possible quality.

NDF plans to continue expanding its services and assisting the private sector in Dominica. To be self-sufficient, Bully believes the foundation needs to maintain a large number of loans. By 1985, she expects that the foundation's portfolio will include 250 loans, valued at $1 million, supporting 600 jobs. The value to the entrepreneurs and the country will be much greater. ■

Dolores Weiss is editor of Front Lines, *an AID publication.*

REKINDLING A SENSE OF PRIDE

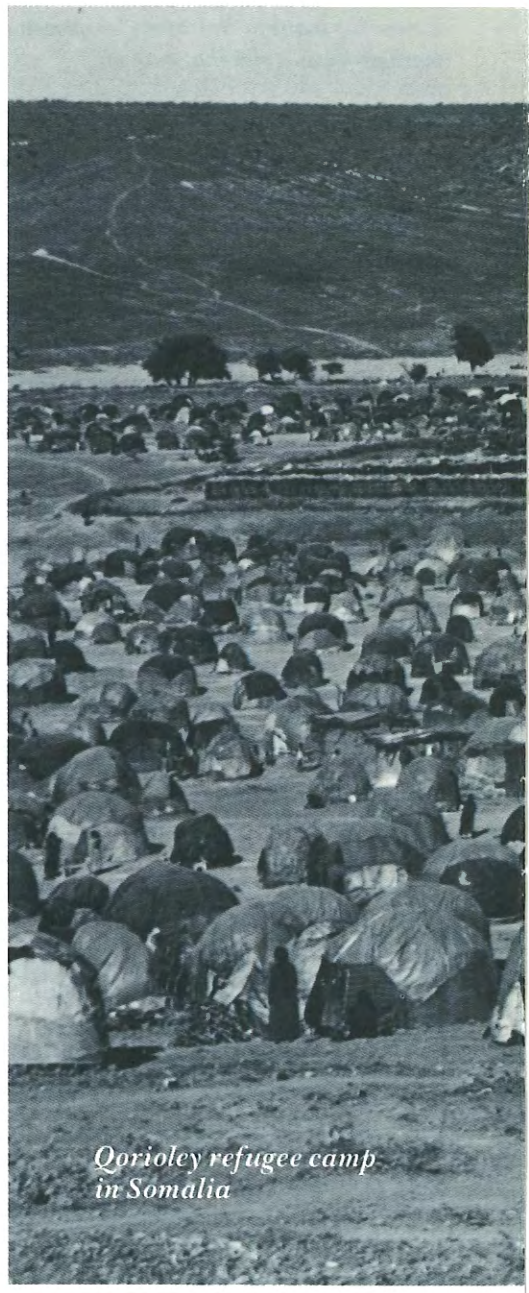
By Betty Woodward

By late 1978, waves of frightened, starving refugees began pouring across the Ethiopian border into Somalia. The conflict between the two countries over the disputed Ogaden region had erupted into a full-scale war. The fighting, on the heels of the "long-tailed drought" that devastated the area in the mid-1970s, forced little Habiba and her family to flee their homeland. Exhausted and ill from lack of food and water, they finally reached the refugee camps near the town of Qorioley, 80 miles southwest of the capital of Mogadishu.

Five years later, the camp is still their home. In many ways, life is better for Habiba and her family than during the time of the drought and the escape. International agencies have provided the basics—food, water, medical care. Habiba even is able to attend school a few hours a day.

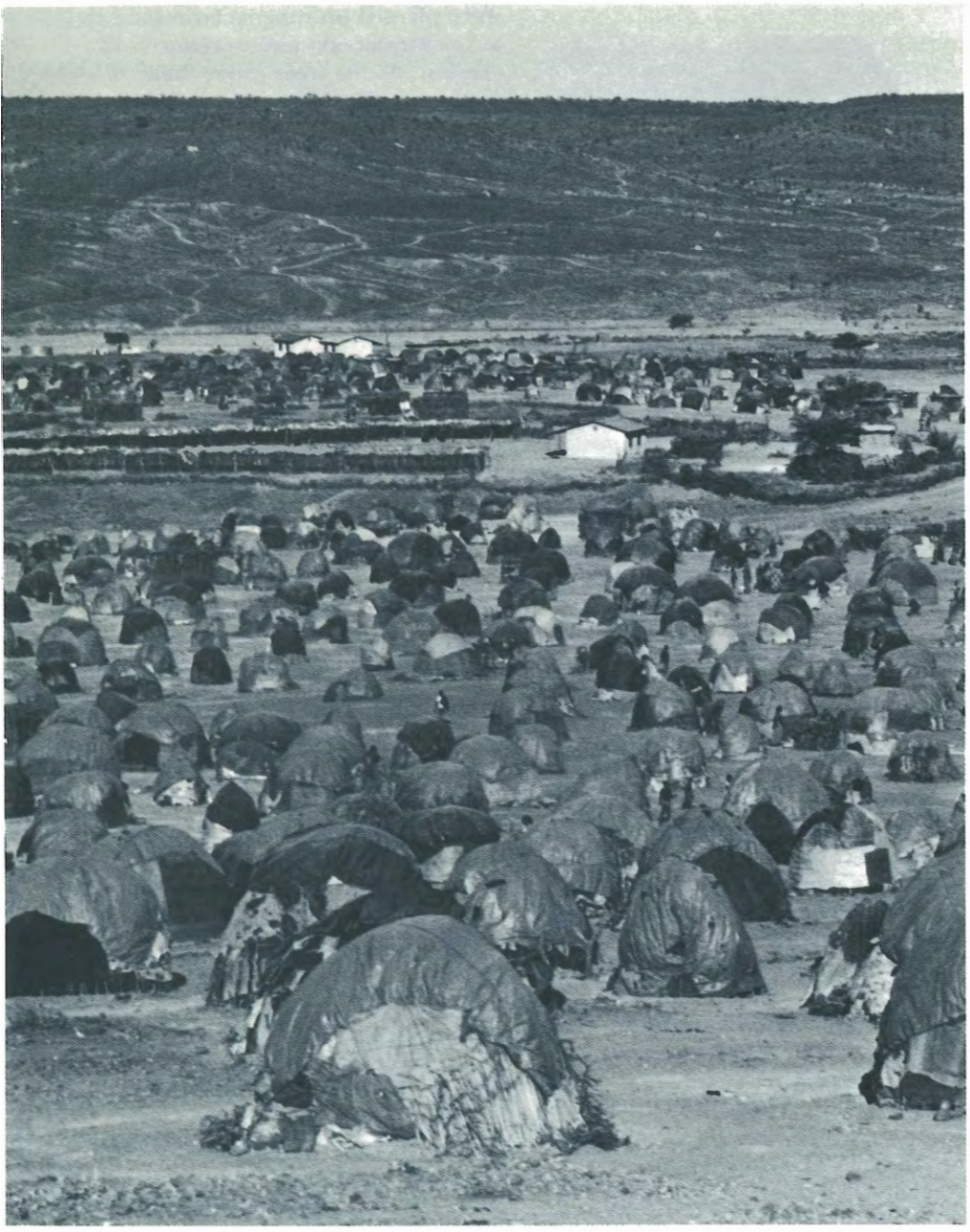
But the family's sense of independence is disappearing. Its quality of life seems contingent on the continuing generosity of others; its future, uncertain. The Ogaden region continues to be prone to drought. While, in the eyes of the world, the earlier "emergency" is over, for those who remain, the crisis has not yet passed. To those used to making their own way with pride and dignity, the dependency fostered by a refugee situation is at first damaging, then addictive. In other words, refugees can easily become captives of the very help that saved them.

The whole family suffers the strain of being displaced—perhaps permanently. Women must take over tasks



Qorioley refugee camp in Somalia

In concert with AID, Save the Children is helping to restore a sense of independence among refugees in Somalia.



like preparing the earth for planting which they have never performed, passing on their normal duties to others because the men are not around the camp. They have either been killed, are fighting in the Ogaden, or are tending their herd. Young children often don't remember a life outside a refugee camp.

Save the Children has recognized the severity of these problems since 1981 when it was asked by the UN High Commissioner for Refugees (UNHCR) to provide emergency assistance. Now, in concert with AID, Save the Children is assisting refugees through community-based development programs to regain their sense of pride and gradually become self-reliant.

A three-year agreement signed in 1983 between AID, Save the Children, and Somalia's National Refugee Commission (NRC) is enabling the private and voluntary agency to expand the scope of its agriculture activities, emphasizing appropriate technology, increased community involvement, and productivity. The grant is part of a multi-year, $12 million AID program aimed at increasing the self-reliance of the refugees through programs in agriculture, small-scale enterprise development, and forestry.

The AID grant is helping approximately 1,700 families farm small plots of irrigated farm land allocated by the government of Somalia in the lower Shebelle River Basin, where the Qorioley camp is located. This is Somalia's most important crop-producing region, providing over 50% of the country's rice, sesame, maize, and sorghum. Many refugees have already cleared land surrounding the campsite, pulling the thick acacia bushes and thorned trees by hand. A canal is being built that will feed water from the Shebelle to the farm land. Farmers will maintain in-field canals and drains to their plots, and ultimately will manage maintenance for the entire canal. The program affords refugees a basic income and an economic safety net. In addition, over 320 hectares for dryland farming have been distributed for crop production to compensate for the reduction in UNHCR

free-food distribution. Eventually, there will be over 1,000 hectares of dryland farming.

The agricultural program extends beyond the refugee camps to the Qorioley community where the villagers' diets are often nutritionally inadequate. In Qorioley, Save the Children is developing and field testing pre- and post-harvest technologies. Locally used tools such as hoes, axes, and ox-drawn plows are being designed and manufactured. Apprentice technicians are demonstrating new technologies to both the refugees and local villagers. Save the Children focuses on increased crop production and introducing new varieties of horticultural crops. To introduce new crops to the refugee farmers, a demonstration garden full of tomatoes, cowpeas, mung beans, and sunflowers is now growing behind Save the Children's office.

Encouraging community participation is an important part of the project. Save the Children staff helped camps to form informal committees to decide how to distribute farm land. The committees are an outgrowth of Save the Children's efforts to involve refugees in decision-making processes. With the help of the community outreach committees, each camp decided how much land each family would get for farming. It varied from one-tenth to one-fifth of a hectare. Most camps voted to give plots closest to the camps to the more disadvantaged families, usually those without children strong enough to work.

Save the Children also interviewed both refugees and townspeople to get their thoughts on general community problems, land distribution, and decision making within the camps. This social survey has netted other results. For example, women are represented in all activities, and forestry councils were established.

The forestry councils play a pivotal role in the camps, but the problems they address extend far beyond the camps' parameters.

A widowed refugee stands proudly by the crop she has produced on land allocated to her under an agricultural development agreement between AID, Save the Children, and Somalia's National Refugee Commission.

Only 12% of Somalia's land is suitable for farming. The Food and Agriculture Organization classifies Somalia a country with "acute scarcity conditions" because of deforestation, overgrazing, and desertification. The presence of hundreds of thousands of refugees on this land of scrub brush, sand, and rocks, plays a part in this dire situation. Natural resources, such as firewood, are quickly disappearing, disturbing the already fragile ecological balance. Lands once used for grazing are now campsites. Valuable topsoil is being dissipated by refugee women walking farther and farther to collect firewood.

The agreement among AID, Save the Children, and the Government of Somalia's National Range Agency (NRA) to address these problems has two major goals: to prevent further destruction of natural resources, and to strengthen NRA's ability to resolve Somalia's natural resource problems. The key to reducing environmental degradation is involving communities in all phases of production, planting, and conservation practices.

Save the Children's activities in the Qorioley camps integrate the relationship between forestry and agriculture. Seedlings from the agency's nursery—the largest in Somalia—were planted on refugee farm land to act as windbreaks and to reduce soil erosion. As the trees grow, their leaves provide fodder for animals; ultimately the wood can be used for home construction.

With AID's support, 335,000 new seedlings are being added to the nursery. Save the Children's fuelwood plantation—where fast-growing leucaena seedlings are cared for by the refugees—also is being expanded.

After the agreement was signed, Save the Children hired two extension agents and a manager of the tree-planting operation secured from the NRC. Working through the refugee forestry councils, thousands of seedlings were planted on farms and around homes, and workshops on fuelwood, agro-forestry, and construction material production were conducted. Management responsibility of the fuelwood plantation already is being shifted to the councils.

Spurred by Save the Children's principles of self-help and community participation, with AID's support, agricultural and forestry practices are being carried out in Somalia to stimulate economic growth and to help refugees become self-sufficient. This integrated approach to refugee assistance and development can be a pattern for the future.

It will certainly in the present play a major role in providing Habiba's family with the economic and social means to regain their sense of human dignity. ■

Betty Woodward is director of public relations for Save the Children.

SPECIAL REPORT

STRONG TRADE WINDS PUSH CARIBBEAN SALES

By Roger Mahan

With CBI in place, incentives now exist for substantial business expansion in the region.

The Caribbean Basin Initiative unveiled by President Ronald Reagan before the Organization of American States in early 1982 offered nations in the Caribbean region an unprecedented opportunity to participate in a major regional development effort. Now, more than two years later, the proposals outlined by President Reagan have been enacted by the U.S. Congress, and the majority of Caribbean nations are beginning to reap the benefits of this package of aid, trade, and investment incentives.

The centerpiece of the Caribbean Basin Initiative (CBI) is an innovative one-way free trade provision allowing duty-free access to the U.S. market for 12 years. Virtually all products exported from Caribbean Basin countries are eligible except textiles and apparel, canned tuna, petroleum products, footwear, and certain other leather goods. The provision is intended to help Caribbean nations diversify their exports. It offers entrepreneurs an incentive for bringing new industries to the region, and should broaden the range of job opportunities for workers.

Other major elements of the CBI include tax incentives aimed at bolstering the region's tourism industry, special measures designed to support the economic development of Puerto Rico, the Virgin Islands, and other U.S. possessions, a one-time $350 million balance-of-payments support and project assistance package distributed during Fiscal Year 1982, and increased economic assistance administered by the Agency for International Development.

The CBI was developed in response to the serious economic difficulties faced by Caribbean states. The Caribbean region has shown tremendous potential for economic growth over the last thirty

years. However, since the late 1970s a combination of circumstances including declining prices for the region's traditional exports, higher costs for essential imports, and increased energy costs created serious balance-of-payments problems and contributed to widespread unemployment. The economic consequences can easily be understood when prices of the region's traditional exports are compared to the rising price of oil during the period. In 1977, one barrel of oil was worth 5 pounds of coffee or 155 pounds of sugar. In 1982, that same barrel of oil was worth 26 pounds of coffee or 283 pounds of sugar.

"The Caribbean Basin Initiative could provide an additional 150,000 jobs a year in the region."

In designing a response to the economic problems faced by Caribbean states, the Reagan administration sought to harness the energy of the market as a means for promoting long-term, sustained development. Before the OAS, President Reagan declared "Nearly all of the countries that have succeeded in their development over the past 30 years have done so on the strength of market-oriented policies and vigorous participation in the international economy. Aid must be complemented by trade and investment. . . . The program I'm proposing today puts these principles into practice."

The CBI relies on the private sector, both in and outside of the United States, to spur increased economic growth in the Caribbean. Its major provisions are incentives for economic activity by businesses and individuals, rather than massive transfers of resources. To succeed, the CBI must win the support of businesses, increase their confidence in the economic opportunities offered by Caribbean nations, and stimulate them to locate and expand operations there. The extent to which businesses take advantage of the trade and investment opportunities will determine the degree of economic expansion the region will experience as a result of the CBI.

The governments of Caribbean nations can also play a major role in promoting the success of the CBI. The CBI offers attractive incentives for these nations to implement policy reforms which will remove impediments to trade and encourage foreign investment in their economies. Those governments that take full advantage of these incentives will ultimately reap the greatest economic rewards.

This approach has been popular with governments in the region. Currently, 20 of the 27 nations of the region have met the qualifications necessary to participate in the trade provisions of the CBI. These qualifications include commitments by governments to open their markets to international trade and to reduce market distortions in their economies like export subsidies and local content requirements. They also require participating nations to engage in self-help measures aimed at promoting economic development, and to respect conventions against the expropriation of private property.

The policy reforms initiated by Caribbean governments complement the U.S. tariff and tax policy changes. Besides initiating these reforms opening up our own market, the U.S. government is making extensive efforts to facilitate the trade and investment initiatives of individual entrepreneurs.

The U.S. Department of Commerce has taken a leading role in encouraging U.S. businesses to take advantage of the opportunities contained in the CBI. It operates a Caribbean Basin Business Information Center to assist companies seeking business opportunities in the Caribbean. The Center engages in an active private sector outreach program which includes counseling and referral services to businesses considering investment in the Caribbean Basin, business development missions to and from Caribbean Basin countries, and a Caribbean Basin Information Network for the storage and exchange of trade and investment information.

The Agency for International Development has made major contributions in support of the CBI. It coordinated distribution of the FY 1982 $350 million balance-of-payments support and project assistance package, and has provided $736 million in Economic Support Funds (ESF) and Development Assistance (DA) in FY 1983, and $593 million in ESF and DA for FY 1984.

Additionally, 10 ongoing and 3 proposed AID projects administered from AID's Washington headquarters, and 23 ongoing and 9 proposed projects administered by AID field missions actively promote the trade, investment, and employment objectives of the CBI.

These projects include a major effort to increase cooperation between U.S. chambers of commerce and Caribbean private sector organizations in developing business opportunities in the region. Other projects seek to improve the performance of

Caribbean companies through management training and technical cooperation, and increase access to credit for businesses in the region.

AID has also contracted with Coopers and Lybrand, a U.S. consulting firm, to provide a wide range of professional services to U.S. companies considering operations in the Eastern Caribbean or Belize. Services include providing general advice and information on the countries and specific data on potential investment costs. Resident professional staff people are available in each country to assist in making appropriate local contacts.

The U.S. Department of Agriculture also operates a number of programs designed to support CBI objectives, including a Caribbean Agribusiness Information Desk providing U.S. businesses with market information and opportunities for agriculture-related investments.

Additional CBI projects are operated by the Overseas Private Investment Corporation, the Export-Import Bank of the United States, the Peace Corps, and other federal agencies.

Although many of these programs are barely a year old, results are already beginning to be seen. Reports indicate that makers of electric motors, sporting equipment, pocketbooks, bedroom slippers, food products, and even computers are setting up or expanding production in the Caribbean Basin. The U.S. Department of Commerce reports that it is receiving up to 70 serious inquiries a day from entrepreneurs interested in business opportunities in the Caribbean.

Clearly, the CBI is having an impact on the economic health of the Caribbean Basin. The vigorous economic recovery in the United States will also have a positive impact on the region, since the U.S. is the most important trading partner of nearly every nation in the Caribbean Basin. American firms purchase over 50% of the total exports of some Caribbean countries.

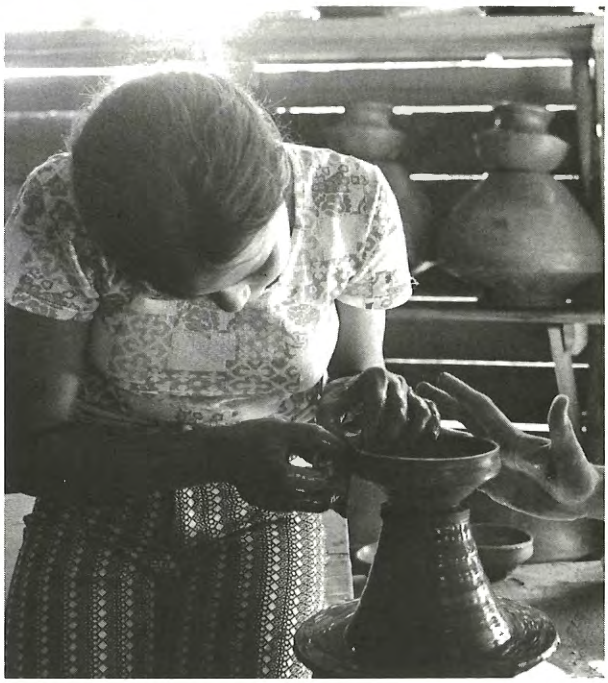
The commitments made by President Reagan before the OAS are being fulfilled. The legislation enacting components of the CBI received broad bipartisan support. U.S. bilateral economic assistance to the Caribbean Basin increased 275% between 1980 and 1983, reflecting a renewed commitment to fostering economic growth and development in the region.

The Caribbean Basin Initiative is now in place. Preliminary estimates suggest that it could provide an additional 150,000 jobs per year in the region. Over the long haul of the 12 year commitment, this should contribute significantly to the revitalization of the Caribbean Basin. ■

Roger Mahan is senior editor of Horizons.

CBI trade provisions seek to strengthen Caribbean economies by promoting non-traditional exports and light industry like this carbon black factory.

Factory shells under construction in Dominica are tangible testimony that the CBI's incentives are at work.



Producers of most handicrafts now have unlimited access to the U.S. market.

When It Rains, It Drys

By Robert Skiles

The sound of the refrigerator door opening and banging shut—a familiar daily sound in most American homes—is seldom heard in tropical developing countries. For most households in the tropics, there is no refrigerator. That means women, who are responsible for food preparation, may have only a few days to use fruits and vegetables before they spoil. How is food preserved? A common solution is solar drying. Instead of refrigeration, food is sliced or diced and spread on the ground to dry.

Given proper conditions, solar drying is an effective way to reduce moisture content in recently harvested food. The method has its shortcomings, however. When rainstorms start without warning, there is a mad dash to protect the produce. And there's always a stray animal ready to sneak a few bites when no one is watching.

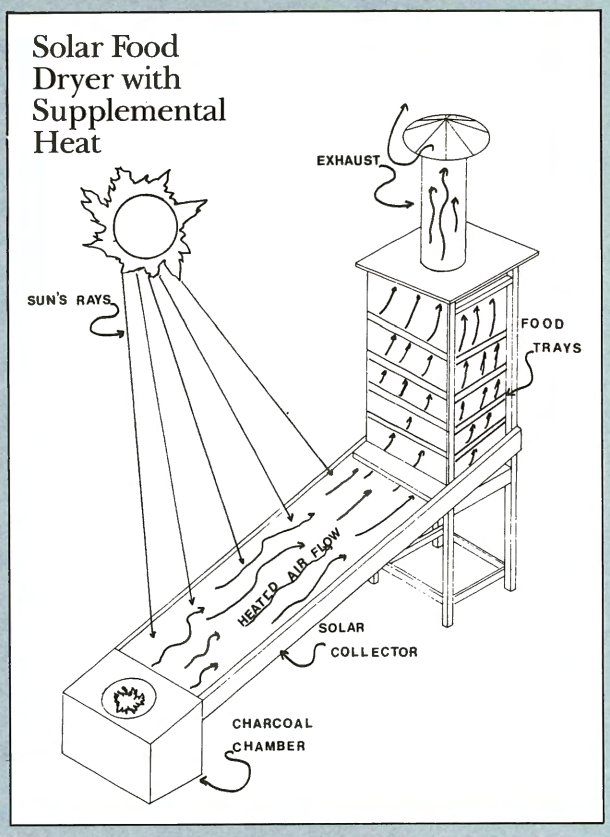
The University of Idaho's Postharvest Institute for Perishables (PIP), funded by AID, recently helped develop a solar food dryer with an added feature—all-weather use. The dryer is a cabinet with supplemental heat that can dry food in all kinds of weather. The heat comes from charcoal burned in a clay pot under the cabinet. Because there are already many types of solar dryers, PIP concentrated on developing a means for supplying the supplemental heat. The Idaho model trials primarily involved temperature control and heat movement and distribution through the drying cabinet.

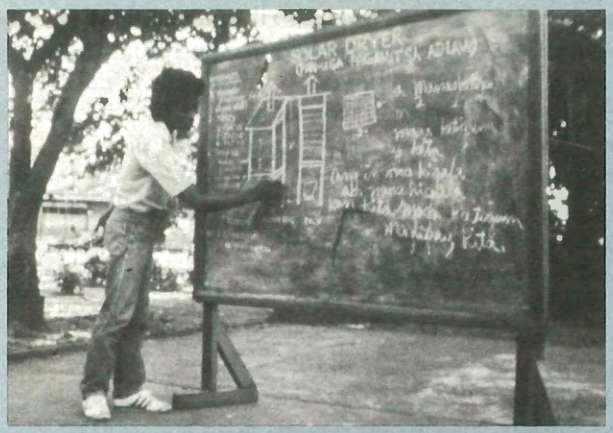
The dryer also had to be inexpensive, and easy to use and to construct from locally available materials. It needed the capacity for all-weather use, and to be effective in preserving perishable foods.

The Idaho design was tested in the Philippines. Marilyn Swanson, a University of Idaho food and nutrition specialist, and Kenneth Hoyt, an agricultural mechanization specialist from PIP, worked with Filipino extension agents from Visayas State College of Agriculture (VISCA). Together, they constructed a solar dryer on site, making charcoal from coconut shells and husks to supply the supplemental heat. The charcoal burned smokelessly and did not taint the food.

Because Filipino extension workers were involved in constructing and

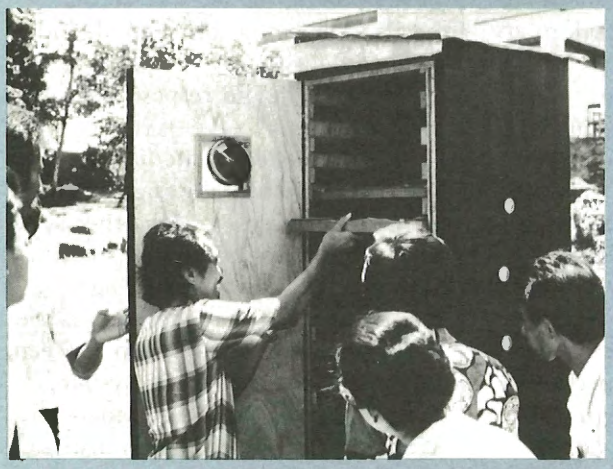
Interested on-lookers watch the prototype solar food dryer with supplemental heat in operation. The diagram illustrates how it works.





Philippine extension workers present the solar dryer program to villagers.

Polyethylene glazing is put on the solar dryer collector.



Visayas State College of Agriculture extension workers helped villagers construct dryers like this model for local use.

operating the dryer, they, in turn, were able to teach villagers the process. Experimental food drying was done at VISCA with various fruits and vegetables, and the drying chamber was modified so that it could be used on a baking oven. Training manuals that described a solar dryer in pictures and words—both in English and Cebuano, the local language—were prepared at VISCA.

The extension workers visited villages to explain solar dryers and to find out if people wanted to build and operate them. The villagers were eager to participate. In less than a week, three villages had constructed dryers. All were made with local materials like split bamboo, scrap lumber, or old sheet metal, which kept costs to about $25 each.

Mangoes, papayas, bananas, plantains, coconuts, and other local fruits were all dehydrated in these village dryers. The fruits were usually sliced or cubed, then dried to about 15% moisture content. They were then stored in sealed polyethylene bags.

The dryers also helped make iba and balimbing, two tart wild fruits, more appetizing. Researchers discovered the two fruits became more palatable when dried after first being soaked in sugar-sweetened water.

Produce dried included sweet cassava, cassava flour, yams (ubi), sweet potatoes, and taro. They were sliced or cubed, then dried to about 10% moisture content or less. Cooking cubed, dried cassava in oil is a popular way to reconstitute it. When salted, it tastes like home-fried potatoes. The villagers are enjoying this novel way of eating cassava. They also learned to use the dryer as a baking oven.

Swanson and Hoyt say the solar dryer project in the Philippines was successful. The solar dryers added an estimated 20% to average family income by preventing food loss from improper or inadequate storage. Furthermore, family incomes increased because preserved food could be transported to the cities, opening up opportunities for cottage industries.

Dietary improvements also resulted from solar dryers. Villagers' current diet, composed mainly of rice and fish, is deficient in vitamins, protein, calories, niacin, riboflavin, and calcium. Dried fruits and vegetables can supply many of these essential nutrients.

For more information, contact PIP, 216 Morrill Hall, University of Idaho, Moscow, ID 83843. ■

Robert Skiles is director of the Postharvest Institute for Perishables.

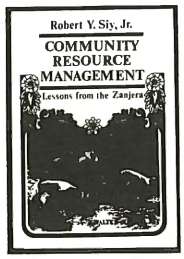
BOOKCASE

Models for Community Participation

Community Resource Management: Lessons from the Zanjera

By Robert Y. Siy Jr., University of the Philippines Press, Quezon City, Philippines, 1982; 193 pp. $12.50 (hard cover); $8.50 (paper).

A review by Douglas J. Merrey



Very few attempts by outsiders to create effective local organizations among the rural poor for managing common resources have succeeded. On the other hand, there are many examples of successful indigenous organizations throughout the world. Southeast Asia, especially the Philippines and Indonesia, has numerous indigenous irrigation associations with long histories. Unfortunately, we know very little about how these associations developed and how they adapt to changing conditions.

In *Community Resource Management: Lessons from the Zanjera*, Robert Y. Siy tries to answer these questions. He spent more than a year studying several individual zanjeras (indigenous irrigation associations), and a unique, century-old federation of nine previously independent zanjeras sharing one river. The 1,000 federation members irrigate about 500 hectares without government assistance. Siy's discussion of the origin, structure, and evolution of the federation is especially fascinating and useful. He combines participant observation, a socioeconomic survey, analysis of historical records, and collection of hydrological data to make this an especially innovative and credible study.

The lessons he learned are applicable beyond improving management of small-scale irrigation systems. They also apply to large ones, as well as to other local community-level organizations managing wood lots, fish ponds, and primary health centers. Many of Siy's points are not new, but he provides a data base for concepts, ideas, and propositions that have not previously had empirical foundations.

Siy notes that the two major concerns of institutional development are how to secure the initial commitment of participants to an organization, and how to keep them active. The zanjeras' success shows how such problems can be solved. First, an appropriate mixture of incentives for participation and sanctions against leaving the group is necessary. The actual methods may vary, and may include informal procedures not easily seen by the outsider.

A second prerequisite is equitable distribution of obligations proportional to benefits. The zanjeras achieve this by allocating responsibilities proportionally according to shares proportional to the land irrigated. As land is subdivided, so are shares. The size of shares determines the amount of labor, money, and materials a person is obliged to provide to the association for system maintenance.

Adaptability to changing conditions is a third prerequisite. Siy shows how the federation developed in response to changes in the river's route and water supply, and how the organization adapted to increasing land fragmentation, declining share sizes, and additional cultivators.

A fourth prerequisite emphasized by Siy is community self-reliance. The local organization must retain control over the resource and be able to use it without interference or assistance from outside. Necessary administrative tasks must fit the needs and skills of the group.

Siy's water measurements showed that water distribution among federation members is inequitable relative to crop requirements. The author offers several explanations. First, most farmers don't perceive water scarcity as a problem. Second, allocation of water is proportional to the allocation of the costs of operation and maintenance; zanjeras receiving the most water also contribute the most to the system's operation and maintenance. Siy notes, however, there is no evidence that this results from a conscious federation effort.

The third and most significant explanation concerns the "transaction costs" of making changes in the complex pattern of water distribution, since so many individuals and groups are involved. This leads to Siy's point that what appears desirable to an outsider on the basis of direct costs and benefits may not be as attractive to the beneficiaries. Transaction costs also may bias the choice of a procedure in favor of one that may appear economically unsound to an outsider.

To encourage local institutional development, the local situation needs to be better understood, and the people who will benefit need to be involved in and responsible for decisions.

Siy's discussion of the linkage between the physical design of an irrigation system—or any other system—and its organizational structure supports this point. A striking characteristic of the federation is the close functional relationship between it and the structure of the system, because the two developed together. Within the zanjeras, land is distributed so that each strip has equal access to the canal. Individual holdings in several zanjeras are divided into several plots at the head, middle, and tail of the system, preventing the divergence of "head" and "tail" interests. Membership in the association is based on the canal, not on

the barrio, or neighborhood.

Our present approach to designing irrigation systems tends to separate institutional and technical components. This results in inconsistency between the physical and organizational structure of the system. According to Siy, greater attention to the relationships between the physical system and social structure is necessary, together with better integration of institutional and technical research.

We no longer have the luxury of allowing each community to slowly develop its own institutions, Siy concludes. Books such as Siy's help us develop strategies to stimulate the development of indigenous local organizations through a participatory approach that encourages people to make their own choices. This seems far better than unintentional destruction of local organizational capacities in the name of development. ■

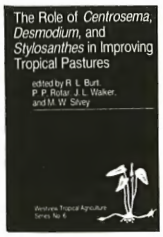
Douglas J. Merrey is senior social scientist in AID's Office of Rural and Institutional Development, Bureau for Science and Technology.

Putting Forage Legumes to Practical Use

The Role of Centrosema, Desmodium and Stylosanthes in Improving Tropical Pastures

Edited by R.L. Burt, P.P. Rotar, J.L. Walker, and M.W. Silvey, Westview Press, 1983; 292 pp. $28.00 (paper).

A review by Gerald O. Mott



This book is particularly timely. Interest in the legume family is increasing, due to the importance of nitrogen fixation to improving tropical pastures. The book is much more than a treatise on the characteristics of the three genera of legumes. Section I discusses animal protein in human diets, the role of ruminant animals in converting forages to useful products for man, and the factors aiding improvement of tropical pastures. Greater longevity of legumes in pasture legume-grass mixtures is being sought to increase feed production, to take advantage of the nitrogen fixed by the legume, to provide a richer protein diet for grazing animals, and to boost soil productivity by increasing the organic matter in the soil and increasing resistance to soil erosion.

Several examples of the introduction of legumes into pastures are described along with the subsequent improvement of forage production and increase in animal performance. Much forage produced in the tropics, for example, is high in fiber, but low in nitrogen, soluble carbohydrates, and essential minerals. Ruminant animals use these low-quality forages to produce animal protein and fat consumed by humans. A deficiency of nitrogen from which animals derive their protein supply is a major constraint on animal production. One of the authors' most important conclusions is that introducing tropical legumes in pastures gives ruminants a source of protein.

In much of the tropics, forage production is dependent upon adequate rainfall. The authors point out that large areas of tropical grasslands have long periods of low rainfall, creating serious feed problems for livestock. They present some suggestions for alleviating feed shortages, including:

- conserving excess forage produced during the wet season for use in the dry season;
- reducing stocking rates during the dry season;
- using commercially available supplemental feeds during the dry season; or
- introducing drought-tolerant legumes and other pasture species to continue feed production well into the dry season.

In section II the authors discuss the diversity, taxonomy, morphology, gene banks, genetic improvement, and adaptation of species within each genera.

Most *Centrosema* species are tropical viny perennials which can grow on the rain-fed fringes of tropical forests, in humid and subhumid savannas, and in semiarid or arid scrublands. Species of this genus show agricultural potential which should expand as soon as suitable collections are available. Currently, they are used as green manure crops, cover crops, and as part of legume-grass associations being grazed where identified. *Centrosema* adapts well to a remarkably wide range of climate, soil, and management systems. An increase in the agricultural use of several species can be expected since the diversity of the various species is almost untapped.

Ten species of *Desmodium* (out of several hundred) show considerable agricultural potential. The species are commonly found in humid and subhumid regions. Some tropical species are found in most tropical countries of the world. Only two cultivars, 'Greenleaf' (*Desmodium intortum*) and 'Silverleaf' (*Desmodium uncinatum*) are being commercially produced as forage and pasture crops. Further research is needed to determine why they cannot be grazed for more than four to six years. Perhaps grazing management is part of the answer.

The authors trace the development of *Stylosanthes* from the early 1900s, and discuss several species in detail. This is a relatively small genus, native mostly to South and Central America. The authors discuss the agronomic potential of several species, including *S. humilis*, *S. hamata*, *S. guianesis*, *S. scabra*, *S. capitata*, and *S. viscosa*. This genus has tremendous potential for improving grazing lands. The authors claim it is relatively easy to domesticate new cultivars but that better collections or gene banks are necessary. Large collections are now being made in the American tropics and subtropics. They are being tested under many environmental conditions which should result in new cultivars well adapted to particular ecological niches.

The collection of *Rhizobium* for the three genera discussed in this book is limited. In many cases, lack of an adapted isolate of *Rhizobium* either for the host plant or for the edaphic (soil) conditions may prevent agronomic exploitation of these legumes. The collection of nodules concurrently with the collection of plant material is required if rapid progress in legume development is to be achieved.

Section III takes a close look at edaphic requirements of tropical legumes. Major and micronutrients are considered, together with their relationship to legume productivity and persistence. Competition between species for the nutrient supplies in the soil is of particular concern in legume-grass associations. The authors also focus on the legume's role in improving soil. Increasing the availability of nitrogen in the soil and the organic matter content, providing a more effective vegetative cover, and providing nitrogen in the recycling stream in pasture ecosystems are all considered.

The final chapter delves into the social and economic aspects of legume-based pastures and incentives for development. It emphasizes the multidisciplinary approach to evaluating genetic resources and strategies for their development in forage-livestock systems.

Tropical pastures are generally low in production of quality feed. An important method of increasing both the quantity and nutritive value of the feed supply in the tropics is the introduction of legumes in forage-livestock systems. This book serves a useful purpose by describing three of the most promising genera of tropical legumes and their use in tropical pastures. ■

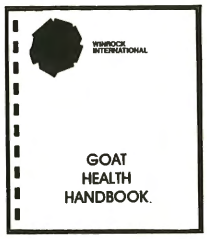
Gerald O. Mott is a professor of agronomy at the University of Florida's Institute of Food and Agricultural Sciences. This publication is the result of a state-of-the-art study funded by AID.

A Field Guide for Goat Producers

Goat Health Handbook

By Thomas R. Thedford, D.V.M., Winrock International, Technical and Information Service, 1983; 123 pp. $4.25 plus postage (paper).

A review by Douglas W. Butchart



The goat was one of the earliest food-producing animals domesticated by man. It is still a primary provider, particularly for those with limited resources. The world's present goat population is approximately 470 million head. Most of these goats—about 440 million—are owned by small farmers or landless people in developing countries. Often, goats are the only source of high-quality protein—milk and meat—and cash income for many people in developing countries.

Goats can play a larger role in using renewable resources—many of which would be otherwise wasted—in the production of quality food and fiber for man. In recent years this role has become better understood. Still, much needs to be learned about goat production, management, nutrition, and disease control.

Thedford has designed this handbook to assist agricultural development workers and extension personnel carry out goat production programs. It is a valuable field guide for goat producers with limited professional veterinary services.

The handbook is divided into five major sections: diagnostic guides, disease descriptions, therapy, techniques of treatment, and birth and the newborn. Appendices include a map showing regions of the world where no incidents of specific diseases have been reported as well as a list of other sources of information on diseases in goats, a glossary, and an index. Thedford's carefully thought-out, pragmatic handbook serves its purpose well. He has kept it non-technical enough to be easily understood by the layman.

The *Goat Health Handbook* is one of a series of informational and training publications from Winrock International. It is intended for use in places where there is little or no access to professional veterinarians. ■

Douglas W. Butchart, D.V.M., Ph.D., is assistant agricultural development officer in AID's Mission in Pakistan.

CARD CATALOGUE

Vector Control of Snail-Transmitted Diseases

David S. Woodruff
University of California, San Diego, Department of Biology
1983, 30 pp.

This report summarizes current vector control research in southeast Asia where parasitic diseases are a major problem. It examines snail-transmitted diseases and their presence in the region; the inadequacy of existing vector control techniques and the need for additional research; Thailand's strong national research program; inadequate funding for vector control in foreign-assisted development projects in the Philippines; and prospects for collaborative research on vector control. Suggestions for possible AID involvement also are made.

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INTERNATIONAL CALENDAR

JULY

15-18 Annual meeting of the Aquatic Plant Management Society, Richmond, VA. Contact: The Aquatic Plant Management Society, PO Box 06005, Ft. Myers, FL 33906

16-20 International Citrus Congress, Sao Paulo, Brazil. Contact: D.C. Giacometti, Cenargen, Caixa Postal 102372, 70770 Brasilia, Brazil

18-19 Board for International Food and Agricultural Development (BIFAD) meeting, sponsored by AID, Washington, DC. Contact: John Rothberg, AID/BIFAD, Room 5318, Washington, DC 20523; telephone (202) 632-0228

19-20 International Symposium on Salmonella, New Orleans, LA. Emphasis on practical methods to prevent salmonella in food animals and their products and in humans. Contact: G.H. Snoeyenbos, Paige Laboratory, University of Massachusetts, Amherst, MA 01003

21-28 Eighth World Conference on Earthquake Engineering, sponsored by the Earthquake Engineering Research Institute, San Francisco, CA. Contact: EERI-8WCEE, 2620 Telegraph Ave., Berkeley, CA 94704

22-Aug. 4 International Symposium on Indo-Pacific Plankton, Shimizu, Japan. Contact: David H. Montgomery, Secretary, Western Society of Naturalists, Biological Sciences Department, California Polytechnic State University, San Luis Obispo, CA 93407

23-27 Annual International Agricultural Conference, sponsored by the International Development Institute, Washington, DC. Contact: Ellen Carlos (202) 547-1727

23-Nov. 2 International Course on Plant Protection, Wageningen, the Netherlands. Contact: Director, International Agricultural Center, Postbus 88, 6700 AB Wageningen, the Netherlands

24-26 Conference on "Water— Today and Tomorrow," sponsored by the Irrigation and Drainage Division and the Arizona Section of the American Society of Civil Engineers, Flagstaff, AZ. Contact: John A. Replogle, U.S. Water Conservation Laboratory, 4331 East Broadway Rd., Phoenix, AZ 85040

AUGUST

6-10 "Evaluation of Project Designs" urban planning workshop, sponsored by the Massachusetts Institute of Technology. The workshop will use cities in Brazil, Sri Lanka, and Egypt as models. Contact: Directors of Laboratory of Architecture and Planning, Building N52-431, 77 Massachusetts Ave., Cambridge, MA 02139

12-16 American Phytopathological Society annual meeting, Guelph, Canada. Contact: APS Annual Meeting, 3340 Pilot Knob Rd., St. Paul, MN 55121

12-17 Second Global Conference on the Future. The theme is "Toward Community: Thinking Freely, Acting Courageously," New Delhi, India. Contact: Global Futures Network, 26 McGill St., Toronto, Canada, M5B 1H2, or 181 Rewa, Haji Ali, Bombay 400 026, India

12-17 World Soybean Research Conference, Iowa State University, Ames, IA. Contact: James B. Sinclair, University of Illinois, Department of Plant Pathology, N-519 Turner Hall, 1102 South Goodwin Ave., Urbana, IL 61801 or Walter R. Fehr, Department of Agronomy, Iowa State University, Ames, IA 50011

13-14 Joint Committee on Agricultural Research and Development (JCARD) meeting, sponsored by AID, Washington, DC. Contact: John Stovall, AID/BIFAD, Room 5316, Washington, DC 20523; telephone (202) 632-8532

13-15 International Conference on Soils and Nutrition of Perennial Crops, Kuala Lumpur, Malaysia. Contact: Secretary, Organizing Committee, Malaysian Society of Soil Science, PO Box 2644, Kuala Lumpur, Malaysia

13-16 Twentieth Annual Water Resources Conference on "Overcoming Institutional and Technical Constraints to Water Resources Management," sponsored by the American Water Resources Association. The conference will include a symposium on the operations for researching water quality goals. Washington, DC. Contact: Claire Welty, U.S. Environmental Protection Agency (WH-565B), 401 M St. SW, Washington, DC 20460

13-17 International Workshop on Psocoptera, sponsored by King's College Field Station, Rogate, Hants, U.K. Contact: B. D. Turner, Department of Zoology, University of London, Strand, London, U.K. WC 2R 2LS

13-Nov. 16 Fourteenth International Course on Vegetable Growing, sponsored by the International Agriculture Center, Wageningen, the Netherlands. Contact: Director, International Agricultural Center, Lawickse Allee 11, Postbus 88, 6700 AB Wageningen, the Netherlands

14-Oct. 31 Eighth International Course on Seed Technology for Vegetable Crops, sponsored by the University of the Philippines, Los Banos, the Philippines. Contact: The Directorate, International Training Program on Seed Technology, PO 430, College, Laguna 3720, the Philippines

19-25 Sixth International Symposium on Biological Control of Weeds, sponsored by the University of British Columbia, Vancouver, British Columbia, Canada. Contact: J. H. Myers IARE, 2075 Westbrook Mall, University of British Columbia, Vancouver, BC, Canada V6T 1WS

20-22 Canadian Pest Management Society annual meeting, Winnipeg, Manitoba, Canada. Contact: N.J. Holliday, Department of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada R35 2N2

20-25 Biennial Conference of the International Institute of Fisheries Economics and Trade, New Zealand. Contact: Dr. Richard Johnston, International Institute of Fisheries Economics and Trade, Department of Agricultural and Resource Economics, Oregon State University, Corvallis, OR 97331

20-26 Seventeenth International Congress of Entomology, Hamburg, Federal Republic of Germany. Contact: B. Heydemann, Deutsche Gesellschaft fur allgemeine und angewandte Entomologie, 101 Shausenstrasse 40/60, Biologiezentrum der Universitat, D-2300 Kiel, Federal Republic of Germany

SEPTEMBER

4-6 First Regional Symposium on Biological Control, sponsored by Universiti Pertanian Malaysia, Serdang, Selangor, Malaysia. Contact: The Organizing Committee, c/o Department of Plant Protection, Universiti Pertanian Malaysia, Serdang, Selangor, Malaysia

10-Oct. 12 Course on Plant Quarantine, sponsored by the U.S. Department of Agriculture, Washington, DC. Contact: David P. Winkelmann, Deputy Administrator for International Training, Room 4118 Auditors Building, Office of International Cooperation and Development, USDA, Washington, DC 20250

12-13 Board for International Food and Agricultural Development (BIFAD) meeting, sponsored by AID, Washington, DC. Contact: John Rothberg, AID/BIFAD, Room 5318, Washington, DC 20523; telephone (202) 632-0228

16-22 Eleventh International Congress for Tropical Medicine and Malaria, Calgary, Canada. Contact: Secretariat 11 ICTMM, Conference Office, The University of Calgary, Calgary, Alberta, Canada T2N IN4

17-20 Twelfth International Conference of the International Association on Water Pollution Research (IAWPR) and Aquatech '84, Amsterdam, the Netherlands. Contact: IAWPR, Alliance House, 29/30 High Holborn, London WC1V 6BA, U.K.

Any additions or corrections should be sent at least three months in advance of the event to International Calendar, Horizons, AID, Room 4890 NS, Washington, DC 20523 or telephone (202) 632-4330.

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