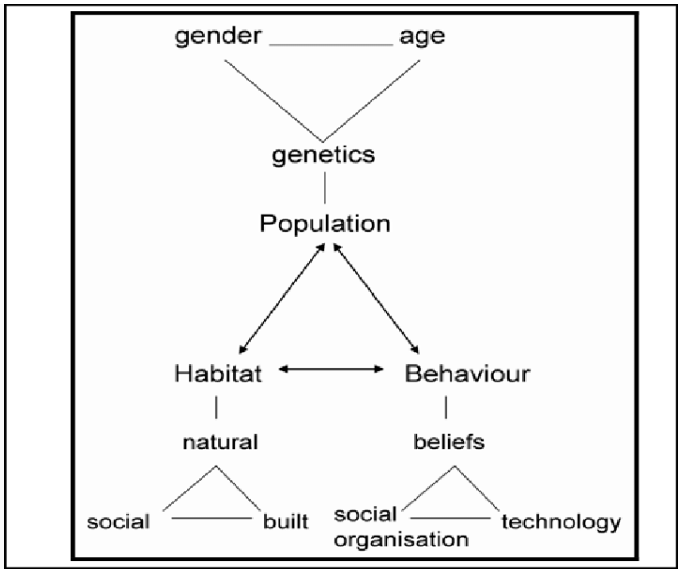
HUMAN ECOLOGY

Human ecology is an interdisciplinary and trans-disciplinary study of the relationship between humans and their natural, social, and built environments. The philosophy and study of human ecology has a diffuse history with advancements in ecology, geography, sociology, psychology, anthropology, zoology, epidemiology, public health, and home economics, among others. Human ecology is the discipline that inquires into the patterns and process of interaction of humans with their environments. Human values, wealth, life-styles, resource use, and waste, etc. must affect and be affected by the physical and biotic environments along urban-rural gradients. The nature of these interactions is a legitimate ecological research topic and one of increasing importance.



Triangle of human ecology

Human Ecology is the study of the interactions between man and nature in different cultures. Human Ecology combines the ideas and methods from several disciplines, including anthropology, sociology, biology, economic history and archeology. Our multidisciplinary approach enables us to comprehensively address issues of environmental justice, sustainability and political ecology. Human Ecology studies human life and human activity in different ecosystems and different cultures in the present and in the past in order to gain a better understanding of the factors which influence the interaction between humans and their environment. The ambition to achieve a more complete view requires an integrated perspective that transcends traditional boundaries between the humanities, social sciences, natural sciences, and technology. A fundamental issue in human ecology is how people's cultural beliefs about the nature affect and are affected by their livelihoods and the social order.

HISTORICAL DEVELOPMENT OF HUMAN ECOLOGY

The roots of ecology as a broader discipline can be traced to the Greeks and a lengthy list of developments in natural history science. Ecology also has notably developed in other cultures. Traditional knowledge, as it is called, includes the human propensity for intuitive knowledge, intelligent relations, understanding, and for passing on information about the natural world and the human experience. The term ecology was coined by Ernst Haeckel in 1866 and defined by direct reference to *the economy of nature*.

Like other contemporary researchers of his time, Haeckel adopted his terminology from Carl Linnaeus where human ecological connections were more evident. Linnaeus presented early ideas found in modern aspects to human ecology, including the balance of nature while highlighting the importance of ecological functions (ecosystem services or natural capital in modern terms). The work

of Linnaeus influenced Charles Darwin and other scientists of his time who used Linnaeus' terminology (i.e., the *economy and polis of nature*) with direct implications on matters of human affairs, ecology, and economics. Ecology is not just biological, but a human science as well. An early and influential social scientist in the history of human ecology was Herbert Spencer. Spencer was influenced by and reciprocated his influence onto the works of Charles Darwin.

The history of human ecology has strong roots in geography and sociology departments of the late 19th century. In this context a major historical development or landmark that stimulated research into the ecological relations between humans and their urban environments was founded in George Perkins Marsh's book *Man and Nature; or, physical geography as modified by human action*, which was published in 1864. The first English-language use of the term "ecology" is credited to American chemist and founder of the field of home economics, Ellen Swallow Richards. Richards first introduced the term as "oekology" in 1892, and subsequently developed the term "human ecology". The term "human ecology" first appeared in Ellen Swallow Richards' 1907 *Sanitation in Daily Life*, where it was defined as "the study of the surroundings of human beings in the effects they produce on the lives of men". Richard's use of the term recognized humans as part of rather than separate from nature. The term made its first formal appearance in the field of sociology in the 1921 book "Introduction to the Science of Sociology", published by Robert E. Park and Ernest W. Burgess (also from the sociology department at the University of Chicago). Human ecology has a fragmented academic history with developments spread throughout a range of disciplines, including: home economics, geography, anthropology, sociology, zoology, and psychology. Some authors have argued that geography is human ecology. Much historical debate has hinged on the placement of humanity as part or as separate from nature. In light of the branching debate of what constitutes human ecology, recent interdisciplinary researchers have sought a unifying scientific field they have titled coupled human and natural systems that "builds on but moves beyond previous work (e.g., human ecology, ecological anthropology, environmental geography)." Other fields or branches related to the historical development of human ecology as a discipline include cultural ecology, urban ecology, environmental sociology, and anthropological ecology. Even though the term ‘human ecology’ was popularized in the 1920s and 1930s, studies in this field had been conducted since the early nineteenth century in England and France.

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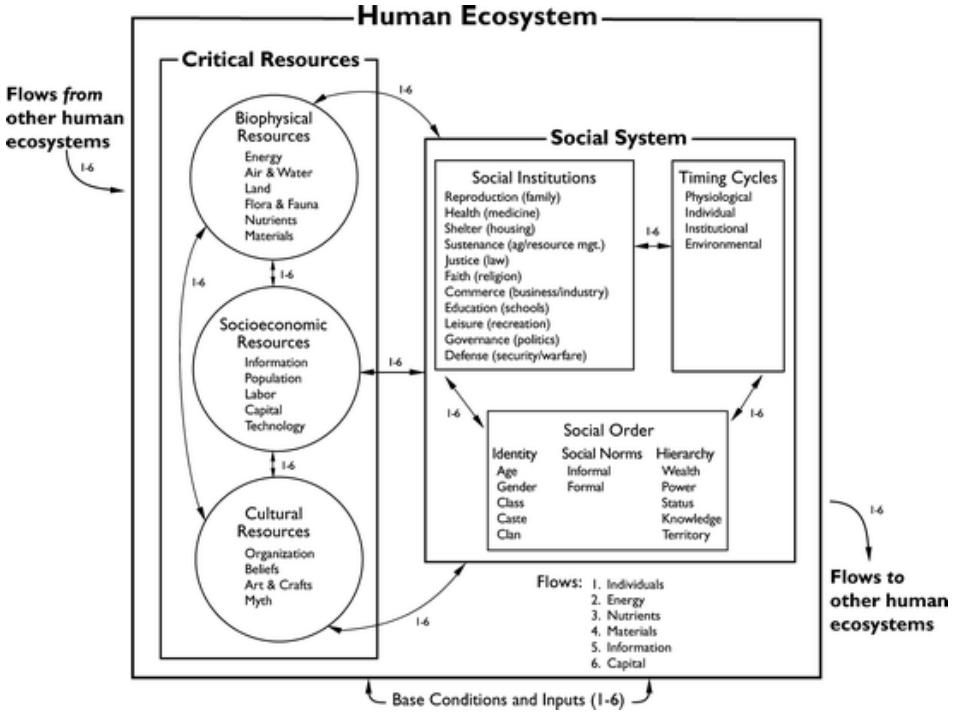


Faculty of human ecology

Human ecology has a history of focusing attention on humans' impact on the biotic world. Paul Sears was an early proponent of applying human ecology, addressing topics aimed at the population explosion of humanity, global resource limits, pollution, and published a comprehensive account on human ecology as a discipline in 1954. He saw the vast "explosion" of problems humans were creating for the environment and reminded us that "what is important is the work to be done rather than the label

SCOPE OF HUMAN ECOLOGY

Human ecology has been defined as a type of analysis applied to the relations in human beings that was traditionally applied to plants and animals in ecology. Toward this aim, human ecologists (which can include sociologists) integrate diverse perspectives from a broad spectrum of disciplines covering wider points of view. Scopes of topics in human ecology are:

- The role of social, cultural, and psychological factors in the maintenance or disruption of ecosystems;
- Effects of population density on health, social organization, or environmental quality;
- New adaptive problems in urban environments;
- Interrelations of technological and environmental changes;
- The development of unifying principles in the study of biological and cultural adaptation;
- The genesis of maladaptions in human biological and cultural evolution;
- Genetic, physiological, and social adaptation to the environment and to environmental change;
- The relation of food quality and quantity to physical and intellectual performance and to demographic change;
- The application of computers, remote sensing devices, and other new tools and techniques

While theoretical discussions continue, research published in *Human Ecology Review* suggests that recent discourse has shifted toward applying principles of human ecology. Some of these applications focus instead on addressing problems that cross disciplinary boundaries or transcend those boundaries altogether. Human ecology is neither anti-discipline nor anti-theory, rather it is the ongoing attempt to formulate, synthesize, and apply theory to bridge the widening schism between man and nature. This new human ecology emphasizes complexity over reductionism, focuses on changes over stable states, and expands ecological concepts beyond plants and animals to include people.

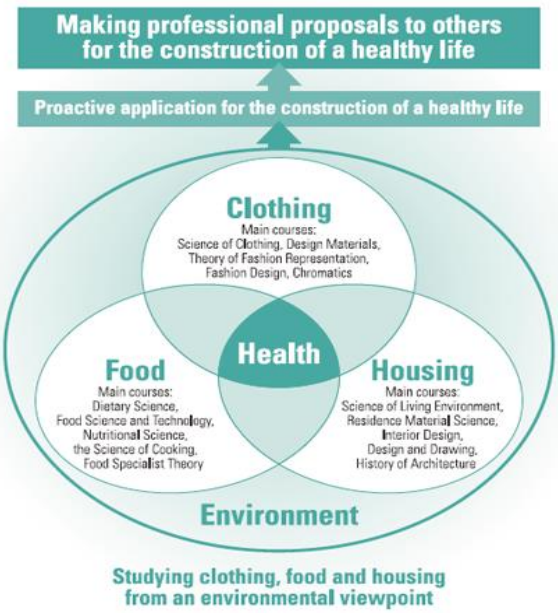
APPLICATIONS OF HUMAN ECOLOGY

1. Application to epidemiology and public health: The application of ecological concepts to epidemiology has similar roots to those of other disciplinary applications, with Carl Linnaeus having played a seminal role. However, the term appears to have come into common use in the medical and public health literature in the mid-twentieth century. This was strengthened in 1971 by the publication of Epidemiology as Medical Ecology, and again in 1987 by the publication of a textbook on Public Health and Human Ecology. An "ecosystem health" perspective has emerged as a thematic movement, integrating research and practice from such fields as environmental management, public health, biodiversity, and economic development. Drawing in turn from the application of concepts such as the social-ecological model of health, human ecology has converged with the mainstream of global public health literature.

2. Connection to home economics: In addition to its links to other disciplines, human ecology has a strong historical linkage to the field of home economics through the work of Ellen Swallow Richards, among others. However, as early as the 1960s, a number of universities began to rename home economics departments, schools, and colleges as human ecology programs. In part, this name change was a response to perceived difficulties with the term home economics in a modernizing society, and reflects recognition of human ecology as one of the initial choices for the discipline which was to become home economics.

3. Ecosystem Services: The ecosystems of planet Earth are coupled to human environments. Ecosystems regulate the global geophysical cycles of energy, climate, soil nutrients, and water that in turn support and grow natural capital (including the environmental, physiological, cognitive, cultural, and spiritual dimensions of life). Ultimately, every manufactured product in human environments comes from natural systems. Ecosystems are considered common-pool resources because ecosystems do not exclude beneficiaries and they can be depleted or degraded. For example, green space within communities provides sustainable health services that reduces mortality and regulates the spread of vector borne disease. Research shows that people who are more engaged with regular access to natural areas have lower rates of diabetes, heart disease and psychological disorders. These ecological health services are regularly depleted through urban development projects that do not factor in the common-pool value of ecosystems.

The ecological commons delivers a diverse supply of community services that sustains the well-being of human society. The Millennium Ecosystem Assessment, an international UN initiative involving more than 1,360 experts worldwide, identifies four main ecosystem service types having 30 sub-categories stemming from natural capital. The ecological commons includes provisioning (e.g., food, raw materials, medicine, water supplies), regulating (e.g., climate, water, soil retention, flood retention), cultural (e.g., science and education, artistic, spiritual), and supporting (e.g., soil formation, nutrient cycling, water cycling) services.



Human ecology and its application

INTERDISCIPLINARY APPROACHES

Human ecology expands functionalism from ecology to the human mind. People's perception of a complex world is a function of their ability to be able to comprehend beyond the immediate, both in time and in space. This concept manifested in the popular slogan promoting sustainability: "think global, act local." Moreover, people's conception of community stems from not only their physical location but their mental and emotional connections and varies from "community as place, community as way of life, or community of collective action." In these early years, human ecology was still deeply enmeshed in its respective disciplines: geography, sociology, anthropology, psychology, and economics. Scholars through the 1970s until present have called for a greater integration between all of the scattered disciplines that has each established formal ecological research.

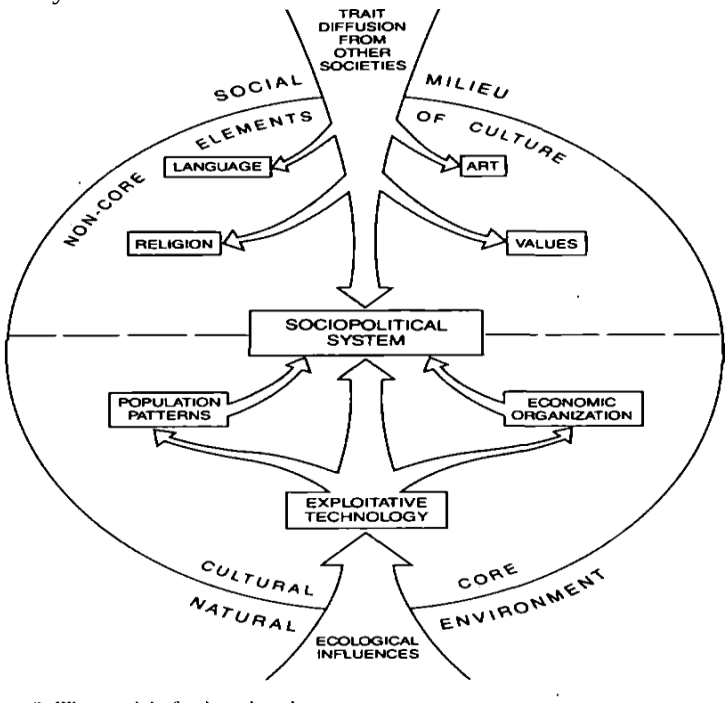
1. In Art: While some of the early writers considered how art fit into a human ecology, it was Sears who posed the idea that in the long run human ecology will in fact look more like art. Bill Carpenter (1986) calls human ecology the "possibility of an aesthetic science," renewing dialogue

about how art fits into a human ecological perspective. According to Carpenter, human ecology as an aesthetic science counters the disciplinary fragmentation of knowledge by examining human consciousness.

2. In Education: While the reputation of human ecology in institutions of higher learning is growing, there is no human ecology at the primary or secondary education levels, with one notable exception, Syosset High School, in Long Island, New York. Educational theorist Sir Kenneth Robinson has called for diversification of education to promote creativity in academic and non-academic (i.e.- educate their "whole being") activities to implement a "new conception of human ecology"

3. In anthropological perspective: While cultural beliefs come into focus in the influential modern sciences like economics, human ecologists examine the modern concepts of economic growth and technological development from an anthropological perspective. By comparing those concepts with other scientifically insights about environmental degradation, climate change and global inequality, human ecology challenges the ideas that perpetuate an unsustainable and unequal global society.

Studies in Human Ecology give you a broad and theoretically deep understanding of the interactions between man and nature in different times and in different parts of the world. Of central importance is to understand how the human relationships with the environment are influenced by their history and their place in the world system.



Conceptual approaches to human ecology

NEW HUMAN ECOLOGY

Human ecology explores not only the influence of humans on their environment but also the influence of the environment on human behaviour and their adaptive strategies as they come to understand those influences better. It is a way of thinking about the world, and a context in which we should define our questions and ways to answer those questions. Human ecology is the sub-discipline of ecology that focuses on human. Human ecology studies the relationship between humans and the natural, social and built environment.

The main tasks of human ecology are:

i. The investigation of human health condition.

ii. The forecast of the health condition of the future generations

iii. The research of dynamics of human health condition in the process of historical and social – economical development

iv. The investigation of the processes of human health protection

v. The analysis of global and regional problems of human ecology

vi. The research of influence of environmental factors to human health.

vii. The composition of medical geographical maps that show the territorial differentiation of human diseases.

viii.The addition of medical geographical maps and environmental pollution maps and the determination of correlative dependence between human diseases and environmental pollution.

ix. The determination of value of boundary technogenic load limit to human organism.

New human ecology

GEOGRAPHY AS HUMAN ECOLOGY

Geography has always been 'vibrant science' which makes it inevitable that there would be diverging options about the nature and scope of geography. As time has passed, there are many children of geography, among them are astronomy, botany, zoology, geology, meteorology, ecology, and anthropology. In addition, geography works repeatedly with new obligations because the frontier areas. There are new centres for research, and have "added" the complexity and extent of their domain. In other words, its boundaries expanded in a few quarters, even; they contracted among others, thus in the recent past, the geographical domain has changed. In the words of Hartshorne (1939) geography seeks to acquire a complete knowledge of the areal differentiation of the world. Geography as a discipline is concerned with the ways in which men occupy the surface of the earth organize themselves spatially and utilize the world's resources in spite of being unevenly distributed (Ginsburg, 1954). This viewpoint is typically geographical in nature; if considered from the point of view of ecologists human geography emphasizes on the physical environment and man's reciprocal relationship with the environment (Theodorson, 1959). Many ecologists have elaborated the relation between geography and ecology. These two disciplines do have some common aspects but still have their differences. Geography has its main interest to study the correlation between habitat and social factors that is the so called direct relationship between man and his environment; while ecology focuses on human communities and concentrates upon man and his habitat. That means for geography

place as a central concept is important but for ecology process in time holds central position. The concept of region also varies in two disciplines. For ecologist region is a unity in physical environment while for a geographer region is a product of contact and division of labour. The above discussion therefore clearly proves that human ecology is something different from human geography.

Human Ecology as a unique field of geography

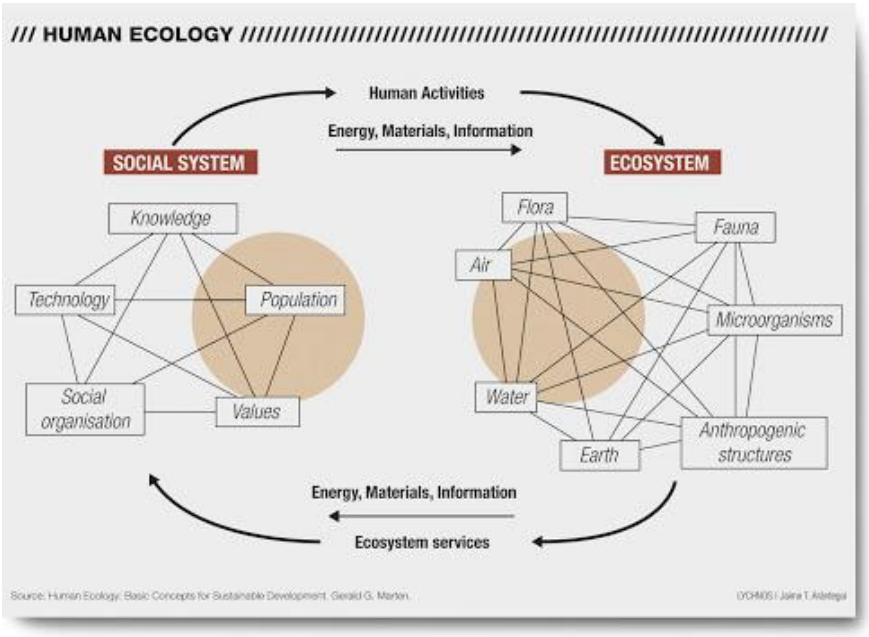
The modern scientific American geography that has recently emerged began with the splendid work of Davis, Gilbert, and a few others in physics or physical geography. It is a singular fact, which may be recalled in passing, that geography, though it is the mother of geology, has, in the recent period which has witnessed its revival in America, as a subject of higher study, been fostered by geology. In one university after another work in geography has been offered first in the Department of Geology. As this work increased, in some cases the official title of the department was changed to "Department-Geology and Geography". Hardly a physical geography was established, an insistent demand arose for what is called "human geography". But as already stated human geography is different from human ecology. Geography treats men and their activities in their visible aspects and so far as they may be regarded as distributed phenomena. It does not concern, except incidentally, the interrelations among men. Human ecology, which is also interested in the relations of man to his geographic environment, fastens its attention upon the human interdependences that develop in the action and reaction of a population to its habitat. In other words, while geography views the adjustment of man from the standpoint of modifications of the earth's surface, human ecology makes a detailed analysis of the process and organization of relations involved in adjustment to environment. This brings us to a second point of distinction between the two disciplines. Geography involves a description of things as they are at a point in time; its interest is in distribution rather than development. Ecology, on the other hand, is evolutionary. It undertakes to describe the developmental process as well as the form of man's adjustment to his habitat (Hawley, 1950). An ecological conception of geography had appeared much earlier, of course, but it failed to attract many enthusiasts at any point in the development of geography as a disdcipline. "Ratzel, taking his clue from the biological use of the term 'ecology,' once suggested that anthropogeography is, in effect, human ecology. From his point of view, as from that of biology, human ecology would be defined as the study of the interaction of man and environment; i.e., it would be that phase of animal ecology which is particularly concerned with the human species"(Nelson, 1936). The doctrine was further strengthened by Barrows in 1922 when in his presidential address before the American Association of Geographers he emphasized that in geography human ecology is the guiding concept. In the words of Barrows (1923) – "Thus defined, geography is the science of human ecology. The implications of the term "human ecology" make evident at once what I believe will be in the future the objective of geographic inquiry. Geography will aim to make clear the relationships existing between natural environments and the distribution and activities of man. Geographers will, I think, be wise to view this problem in general from the standpoint of man's adjustment to environment, rather than from that of environmental influence. The former approach is more likely to result in the recognition and proper valuation of all the factors involved, and especially to minimize the danger of assigning to the environmental factors a determinative influence which they do not exert." Further while defining geography as human ecology he stated "geography is the science of human ecology. . . . Geography will aim to make clear the relationships existing between the natural environment and the distribution and activities of man.' The Nature of Human Ecology: Human ecology is a relatively current development; the first use of the term in the literature was in 1921. The first book with title as ecology appeared in 1935 and interestingly was the work of a botanist. In this brief span of time, the discipline of ecology has evolved quite rapidly. When concerned with human ecology one can relate to Mackenzie's (1931) definition which states that Human ecology deals with the spatial aspects of the symbiotic relations of human beings and human institutions. Human ecology, in so far as it is concerned with a social order that is based on competition rather than consensus, is identical, in principle at least, with plant and animal ecology. Society, as ecologists have conceived it, is a

population settled and limited to its habitat. The ties that unite its individual units are those of a free and natural economy, based on a natural division of labour. Such a society is territorially organized and the ties which hold it together are physical and vital rather than customary and moral, Human ecology has, however, to reckon with the fact that in human society competition is limited by custom and culture. The cultural superstructure imposes itself as an instrument of direction and control upon the biotic substructure.

Reduced to its elements the human community, so conceived, may be said to consist of a population and a culture, including in the term culture (1) a body of customs and beliefs and (2) a corresponding body of artifacts and technological devices. To these three elements or factors- (1) population, (2) artifact (technological culture), (3) custom and beliefs (non-material culture) -into which the social complex resolves itself, one should, perhaps, add a fourth, namely, the natural resources of the habitat. It is the interaction of these four factors-(1) population, (2) artifacts (technological culture), (3) custom and beliefs (non-material culture), and (4) the natural resources that maintain at once the biotic balance and the social equilibrium, when and where they exist. The changes in which ecology is interested are the movements of population and of artifacts (commodities) and changes in location and occupation-any sort of change, in fact, which affects an existing division of labor or the relation of the population to the soil.

Human ecology is, fundamentally, an attempt to investigate the processes by which the biotic balance and the social equilibrium (1) are maintained once they are achieved and (2) the processes by which, when the biotic balance and the social equilibrium are disturbed, the transition is made from one relatively stable order to another. A number of human geographers accept the definition of human ecology as the study of mutual relations between men and environment, but in practice they have limited its application to a specialized field of geographic study. Some geographers-for example, Barrows, Renner, and White make human ecology synonymous with human geography. Barrows, the first geographer to publish this point of view, has written as follows: . . .the centre of gravity within the geographic field has shifted steadily from the extreme physical side toward the human side until geographers in increasing numbers define their subject as dealing solely with the mutual relations between man and his environment. . . . White and Renner, whose volume is entitled Geography, an Introduction to Human Ecology, limit this field to a study of the direct relations between men or groups and their environments.

This specialized field of study investigates problems of man's relation to his environment, both individually and in groups, such as (1) the effects of climate upon human health and energy; (2) the influences of resources and topography upon human occupations, homes, institutions, and inventions; (3) influences of natural routes and barriers upon social isolation and contact; and (4) possible effects of natural surroundings upon customs, attitudes, and beliefs. Thus these human geographers, who define human ecology as a specialized field of science, obviously disagree with Bews who regards it as an inclusive synthesis. Human ecology, like other specialized sciences may be defined and delimited in terms of the basic abstractions it makes. In particular, human ecology abstracts (i) a distinctive type of ecological inter- action and (ii) a distinctive aspect of community or regional structure that arises out of this interaction.



Human ecology and development

To sum up human ecology may now be defined tentatively as a specialized field of analysis which investigates (i) those impersonal sub-social aspects of communal structure- both spatial and functional-which arise and change as the result of interaction between men through the medium of limited supplies of the environment, and (ii) the nature and forms of the processes by which this sub-social structure arises and changes. The value of human ecology depends upon the validity and significance of its own specialized abstractions and not upon its service in supplying indexes of social life. Conclusions: The old geography, although it has lost many specialties, still tries to cover too much ground and it will obviously benefit from physics, climate science, plant ecology and animal ecology as these organized sciences when will mingle with geography will make it more specialized. Relationships between man and earth, which are the result of their efforts to survive, are generally the most direct and intimate; most of the other relationships are established through these. Human ecology provides space to study spatial organization rather than areal differentiation which became a dominant doctrine within the discipline of geography. This is a positive outcome as but at the same time has its short comings. According to Chorley (1973) the traditional ecological model is inadequate in answering the raised questions especially as it does not give man it's due place rather casts it in the role of a subordinate. The Hagerstrand's time space geography gave recognition to this approach when he talks of "web-model of space-time interaction" where he suggests that this approach incorporates certain essential biotic and ecological predicates within human geography and seeks to bridge the gap between human and biological ecology