

PROPER MANAGEMENT OF HUMAN ECOLOGY FOR SUSTAINABLE DEVELOPMENT IN SUB-SAHARA REGION.

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ABSTRACT

Over the last 50 years, the world looked at economic status alone as a measure of human development. Human creativity and activity has brought a breathtaking pace of technological innovations and scientific breakthroughs. Due to increased human population, pressure on natural resources is being increased so as to meet the basic requirements of growing population. Overexploitation of natural resources has caused many environmental problems. The developmental activities including agriculture have accelerated the process of desertification and also reduction of genetic diversity. Air, water and land pollution became a great challenge which is intimately connected with the population and ecosystem. Inland water bodies and coastal areas are treated as dumping ground for wastes which is adversely affecting terrestrial, aquatic and marine life. Unsustainable developments ignores that the human

Introduction:

WHAT IS HUMAN ECOLOGY?

Ecology is the science of relationships between living organisms and their environment. Human ecology is about relationships between people and their environment. In human ecology the environment is perceived as an ecosystem (see Figure below).



(Begon, M., J.L. Harper, and C.R. Townsend. 1990. Ecology: Individuals, Populations, and Communities. Cambridge Mass.: Blackwell.)

managed systems degrade the natural resources by consuming non renewable resources and reducing the capacity of natural system to renew or recycle the resource. Caring for natural resources and promoting their sustainable use is an essential response of the world community to ensure its own survival and well being. Sustainable development has local and global dimensions. At local level sustainable development implies to increase the productivity of ecosystem by environment preservation. However, at global level the productivity is increased by causing stress on the ecosystem. Sustainable development helps the people of the world to live healthy, fulfilling and economically secure life without causing any damage to the ecosystem as well as without the expanse of resources of the future generation and the planet. Sustainable development can be defined as meeting present needs without compromising the ability of future generations to meet their own needs. It is about leaving the opportunity for a decent life to our children and grand children. Ecologically sustainable development is about keeping ecosystems healthy. It is about interacting with ecosystems in ways that allow them to maintain sufficient functional integrity to continue providing humans and all other creatures in the ecosystem the food, water, shelter and other resources that they need. Sub-Sahara (Nigeria and its neighbors) has not been ecologically sustainable because it failed to maintain the proper balance of forested water sheds essential for a healthy landscape. Nor is it ecologically sustainable development to ex terminate marine animals, destroy forests to obtain cooking fuel or pollute marine ecosystems with a lots of pollutants.

An ecosystem is everything in a specified area – the air, soil, water, living organisms and physical structures, including everything built by humans. The living parts of an ecosystem –microorganisms, plants and animals (including humans) – are its biological community. Ecosystems can be any size. A small pond in a forest is an ecosystem, and the entire forest is an ecosystem. A single farm is an ecosystem, and a rural landscape is an ecosystem. Villages, towns and large cities are ecosystems.

A region of thousands of square kilo meters is an ecosystem, and the planet Earth is an ecosystem. Although humans are part of the ecosystem, it is useful to think of human–environment interaction as interaction between the human social system and the rest of the ecosystem (as seen figure above). The social system is everything about people, their population and the psychology and social organization that shape their behavior. The social system is a central concept in human ecology because human activities that impact on ecosystems are strongly influenced by the society in which people live. Values and knowledge – which together form our worldview as individuals and as a society – shape the way that we process and interpret information and translate it into action. Technology defines our repertoire of possible actions. Social organization, and the social institutions that specify socially acceptable behavior. The management of resources from nature, termed “natural resources”, has been of growing concern throughout the world, particularly over the past half century, when their rapid destruction has been brought to public attention by scientists. This concern has been driven by the increasing awareness of the damage that is inflicted upon the environment through human use of nature as a resource. The damage occurs at local and global levels and is not only immediate in some of its effects but also persistent, even irreversible, in others.. All nations of the world were issued with a mandate to protect the environment for the benefit of present and future generations. The alarm, based upon worries for the future environments and, therefore, the lives and livelihoods of human beings, led to a series of explanations focusing in the first instance upon population and then widening into considerations of the very process of economic development.

OBJECTIVES OF HUMANE COLOGY FOR SUSTAINABLE DEVELOPMENT:

Scientific findings ,aspect of human ecology was a perspective for problem solving that focused on interactions between human societies and the environment. By tracing chains of these effects through ecosystems and

human society, and by understanding more generally how people interact with ecosystems human ecology could help to:

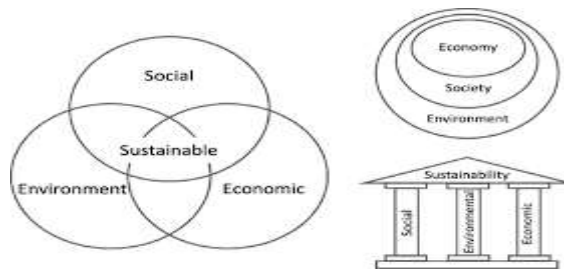
1. Understand the concept of sustainable development.
2. Know the international efforts in sustainable development.
3. Understand different strategies to be adopted for Sustainable development.
4. Know the role of eco-city and green technology in sustainable development.
5. Anticipate the long-range environmental consequences of human actions.
6. Avoid disastrous surprises from the environment.
7. Generate ideas for dealing with environmental problems.
8. And, in general maintain a liveable and sustainable relationship with the environment.

MAIN BODY/METHODOLOGY:

RESEARCH QUESTIONS:

1. Why do ecosystems matter to human health?
2. How have ecosystems changed and what are the health implications?
3. How might ecosystems change and what would be the health implications?
4. What actions are required to address the health consequences of ecosystem change?

A crucial ingredient for sustainable development is a well-informed public. All actions that impact the environment come ultimately from individuals. It is public opinion that stimulates governments, corporations and other sectors of society to appropriate action. Even political leaders who are strongly committed to sustainable development cannot impose it upon people who do not understand or appreciate its importance. Conversely, even the most reluctant of political leaders cannot fail to pursue sustainability when their people demand it, shape the possibilities into what we actually do. Like ecosystems, social systems can be on any scale – from a family to the entire human population of the planet.



(Young, G. 1974. Human ecology as an interdisciplinary concept: a critical inquiry. *Advances in Ecological Research* 8: 8-105).

The sustainable development has three main principles:

- 1) Economic aspect: The poverty should be exterminated through the optional and efficient use of natural resources.
- 2) Environmental aspect (Ecologically): The conservation and enhancement of physical and biological resource base avoiding overexploitation of renewable resources and depletion of non-renewable resources. It is mainly focused on maintenance of biological diversity, atmospheric stability and ecosystem services and functions.
- 3) Socially: It is related socially sustainable system based on distributional equity, welfare of people, improving access to basic health and education service, gender equity, political accountability and participation.

DISCUSSION OF RESULT:

How have ecosystems changed and what are the health implications?

The ecosystem provides services to the social system by moving materials, energy and information to the social system to meet people's needs. These ecosystem services include water, fuel, food, materials for clothing, construction materials and recreation. Movements of materials are obvious; energy and information are less. So Every material object contains energy, most conspicuous in foods and fuels, and every object contains information in the way it is structured or organized. Information can move from ecosystems to social systems independent of materials. For example a hunter's discovery of his prey, a farmer's observation of his field, a city dweller's assessment of traffic when crossing the street, and a refreshing

walk in the woods are all transfers of information from ecosystem to social system. Material, energy and information move from social system to ecosystem as a consequence of human activities that impact the ecosystem. Below are number of ways through which human ecology affect ecosystem:

- 1) **Fresh water:** Many aspects of the world's hydrological (water) cycle are regulated by the natural functions of ecosystems and associated geophysical processes (such as evaporation and the functioning of the climate system). Human interventions in watersheds, lakes and river systems take many forms deforestation, farming, irrigation, river damming and extractions from subterranean aquifers. Wetlands play a crucial role in the filtering of fresh water, including the removal of various chemicals and potentially toxic elements (e.g. heavy metals such as cadmium and lead).
- 2) **Food:** Productive terrestrial and marine ecosystems, both wild and managed, are the source of our food - a prerequisite for health and life. Global aggregate food production currently is sufficient to meet the needs of all. However, of the present world population of 6.5 billion, over 800 million - nearly all of them in low-income countries - do not obtain enough protein and calories for energy. Worldwide, a similar (increasing) number are now overfed. Several billion people experience deficiencies of one or more micronutrients (especially vitamin A, zinc and iodine).
- 3) **Sources of power:** Many processes and resources in nature provide power that can be harnessed by human communities, especially wind, water and biomass combustion. Different geographical regions and countries at varying stages of development use varied methods of generating power. This has many health impacts and the availability of power, especially electricity, has important applications in health care. Over half of the world's population continues to rely upon solid

fuels for cooking and heating. These fuels - including wood, crop stubble and animal dung - are a direct product of ecosystems. Indoor air pollution produced by the combustion of biomass fuels as well as coal in poorly ventilated heating and cooking environments, causes significant mortality and morbidity from respiratory diseases, particularly among children.

- 4) **Biological products:** Millions of people around the world depend partly or fully on natural products collected from ecosystems for medicinal purposes. Although synthetic medicines (over half of which originated from natural precursors) are available for many purposes, the global need and demand for natural products persists. Some of the better-known mainstream pharmaceuticals from natural sources include aspirin, digitalis and quinine. Regulation of infectious disease Infectious diseases are caused by viruses, bacteria and other types of microbes or parasites. Only a few infectious agents cause actual disease in plants, animals and humans; usually these are constrained geographically and seasonally by ecosystems and ecological relationships in nature. Patterns of microbe entry into the human species (sometimes as new mutants) are sensitive to climatic and micro-environmental conditions. These factors may impact upon the spread of microbes between humans; their more distant dissemination; and the activity of vector organisms (e.g. mosquitoes) involved in their transmission. Often human induced changes in ecosystems and in physical environmental conditions alter these natural influences on infectious agent range and activity.
- 5) **Nutrient and waste management, processing and detoxification:** Ecosystems play a critical role in the recycling and redistribution of nutrients. This fundamental service underpins the health of plant and animal species everywhere. Disruption of nutrient cycling can impair soil fertility, resulting

in reduced crop yields. This impairs the nutritional status of households (medium certainty) and diet deficiencies (both macro-and micro-nutrients) harm children's physical and mental development. In turn, this can impair the livelihoods of farmers and limit the options open to their children. Human health can be harmed by exposure to certain toxins produced by algal blooms. These can occur as a result of eutrophication of waterways excessively loaded with nitrates and phosphates infiltrating from run-off water discharged in agricultural, industrial and domestic processes.

- 6) **Climate regulation:** Regional climatic conditions are influenced by changes in ecosystems and landscapes, especially deforestation and desertification. On a larger scale, the ongoing human induced alteration of atmospheric composition (the greenhouse effect) also affects climatic conditions. Each of the ecosystem services described above is sensitive to climatic conditions and therefore will be affected by human-induced climate change. In turn, these ecosystem changes will affect the well-being and health of human populations. Meanwhile, climate change itself does, and will, affect human health.

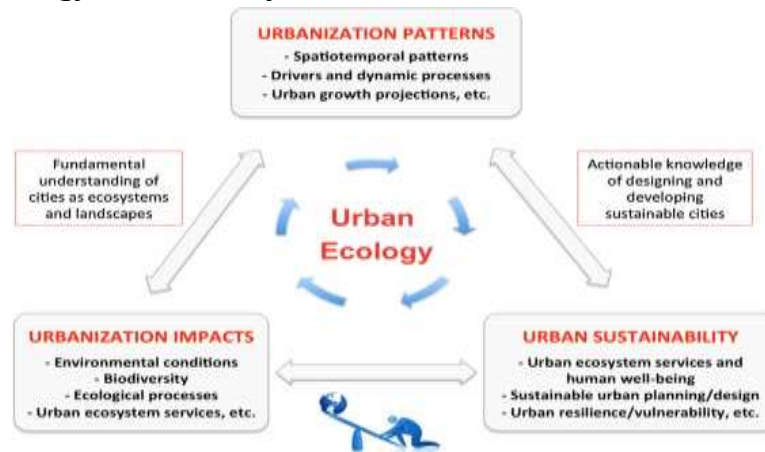
RECOMMENDATION:

WAYS TO ADDRESS THE HEALTH CONSEQUENCES OF ECOSYSTEM CHANGE:

There are two strategies for avoiding disease and injury caused by ecosystem disruption.

- 1) Preferable in principle - is to prevent, limit or manage the environmental damage. The other is to make adaptive changes that will protect individuals and populations from the adverse consequences of ecosystem change. These should not be viewed as alternatives; both strategies are useful.
- 2) Aspects need to be considered to understand the potential negative health impacts of ecosystem change: the current (and likely future) intrinsic vulnerability (e.g. nutritional status) of populations and their

likely future capacity for adaptation. These are closely related. In many cases the forces that place populations at risk (such as poverty and high burdens of disease) also impair their capacity to prepare for the future. Effects of human ecology on the ecosystem.

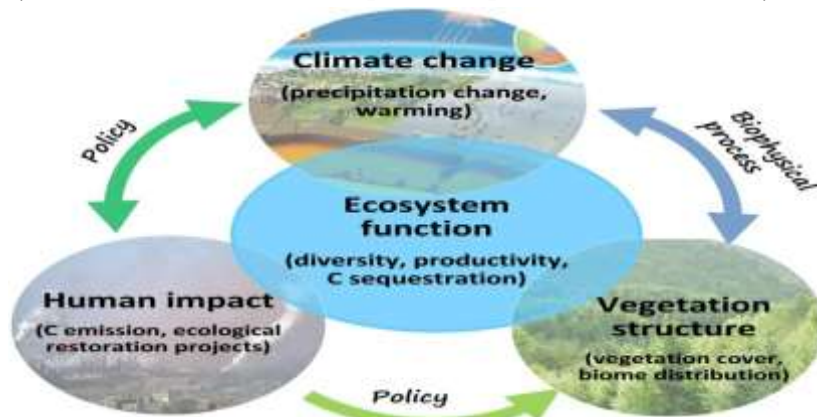


(Moran, E.F. 1979. Human Adaptability: An introduction to ecological anthropology. North Scituate, Mass.: Duxbury Press. Emphasizes the ecosystem concept as an organizing principle. Early historical chapters excellent.)

OTHER WAYS TO ADDRESS THE HEALTH CONSEQUENCES OF ECOSYSTEM CHANGE:

- The adoption of pollution prevention as a method for examining pollution-reduction opportunities before the point of effluent, emission, or waste generation or discharge.
- The development and implementation of incentive-based offset and “cap and trade” control measures (plant-specific and regional) for such issues as acid-deposition precursors, including nitrogen oxides and sulfur oxides.
- The establishment of an expanded number of voluntary initiatives aimed at accelerating the reduction of toxic emission, expanding energy efficiency, and other objectives.
- The initiation of cross-statutory or multisector initiatives that aspired to identify and manage tradeoffs among statutes to maximize both environmental protection and economic efficiency.

- The development of more robust initiatives with state and local authorities to address regional air-quality and water-quality problems (such as ozone and fine-particle pollution in the air)

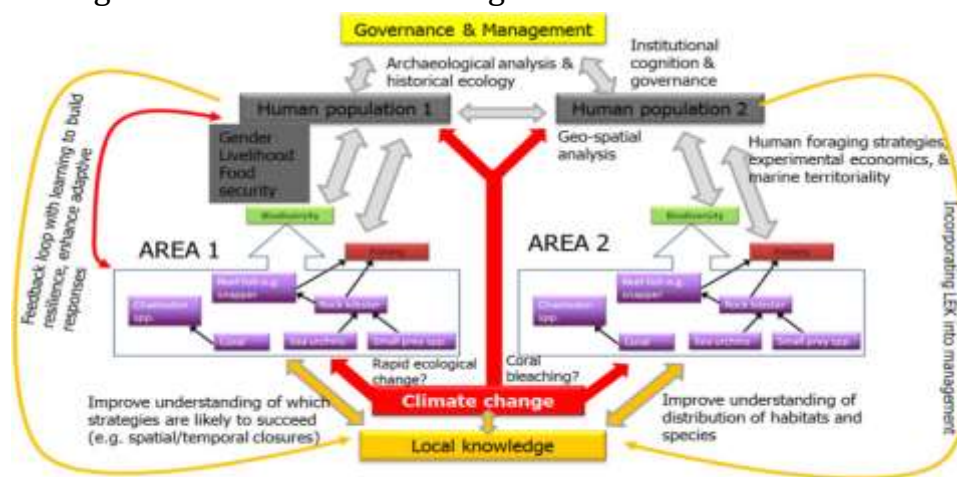


Effects of human ecology on the ecosystem. (United Nations Conference on Environment and Development, 179)

MANAGEMENT OF NATURAL RESOURCES:

All resource use bears a cost to nature; the issue is whether it is a cost worth bearing and, if so, what the limits should be. This is what the management of resources from nature is all about: recognizing limits and developing capabilities to prevent those limits from being exceeded. The management of the various elements and systems requires an understanding of all the components. In the case of the environment, the systems involved are multifaceted and complex, incorporating physical and biological elements, including human. Furthermore, it is invariably a complex set of natural elements, rather than a single element, that forms the resource. The same elements of nature in different combinations and configurations provide the varied resources for human-kind as they are used in different ways and given value. For example, water is a resource for a range of human uses—direct human consumption, agriculture, recreation, and energy. Vegetation is a source for direct human consumption, agriculture and agribusiness, tourism (through the amenity value of landscape and scenery), and also as a source of energy.

The human use systems determine the combination of elements where by nature is transformed into, and managed as, resource for human use and activity. Environmental protection, therefore, was incorporated into sustain-able development strategies. It sometimes sits uneasily in this position; for though it is part of the solution, the thresholds of compromise are difficult to establish and are most certainly not universally agreed. Nevertheless, environmental management is needed to proceed With the task of finding and implementing guidelines for the patterns Of resource use that accompany development. What this really means Is that environmental management is needed to manage people and Their diverse and potentially damaging activities that take place, Either with in the context of ownership right sor of the use and misuse ofshored resources– in particular, water and air.These include the Range of formally institutionalized, as well as informal, activities. How the objective of sustainable development may be achieved remain major challenge. It clearly involves the management of human behaviour, but the terms of reference for such amandate are complex .In order that these may be clarified overtime and before time runs out, it e sessential that the problem be addressed from every perspective. This should include the continued search for scientific evidence of damage sustained by nature due to human activity ,the continued search for criteria to determine appropriate actions, and the mechanisms for achieving agreed behaviours in future. Ecosystem management is shown in the diagram below:



Flaganyi & Asewani Conceptual Model

(United States Forest Service, 90-2&unsustainable human-ecosystem interaction, 136-7, 222)

CONCLUSION:

This paper is designed to make all people interested in the topical issue of “Man and His Environment” appreciate the complex nature of the environment. Ecologically sustainable development may only be possible once we have grasped the fundamental interdependence of human society and the natural environment. Human ecology, as the science of human-environment interaction, provides a whole-system perspective that bridges the gap between the natural and social sciences. It is a broad perspective that can help to clarify environmental issues and suggest how to deal with them. While human ecology has proved its worth as an interdisciplinary approach to solving environmental problems, it has not yet attained a clear identity with an established body of theory. The time has come for human ecology to become a major scientific discipline in its own right. The stake that we all have in an ecologically healthy future is far too great to settle for less. The environment has five main components to it all which man has his influences in. All these influences in all the components of the environment of man, have to be factored into reckoning, in assessing accurately the role of man in his environment. This is an important issue this paper has brought into the consciousness of all environmentalists and all people concerned with the management of the natural environments. It is actually true that the natural environment is a large environment, covering the entire planet earth. The paper however makes it clear that a number of other environments exist, whose complex interplay in their relationships, help in sharpening the activities of man in each of the diverse environments. It therefore stands to reason that any one desirous of a near comprehensive account on the concept of “Man in His Environment,” must take cognizance of the complex interplay of human activities in these diverse environments, as done in this paper. There is a close connection between the sustainability of human-ecosystem interaction and the intensity of demands that people place on ecosystems.

We all depend on ecosystems for material and energy resources. Some resources such as mineral deposits and fossil fuels are non-renewable; other resources such as food, water and forest products are renewable. People use these resources and return them to the ecosystem as waste, such as sewage, garbage, or industrial effluent. In general, greater demands on ecosystems in the form of more intense resource use are less sustainable. Intense use of non-renewable resources exhausts the supply more quickly. Intense use of renewable resources can damage the ability of ecosystems to provide the resources. Sustainable interaction with ecosystems is only possible if demands are kept within bounds.

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