Human Ecology: Concepts and meanings

Background

An ecosystem is a geographic area where living and non-living things interact to form a bubble of life

The biosphere is a global ecosystem made up of living organisms (biota) and the nonliving (abiotic) factors that provide them with energy and nutrients.

- Human activities have damaged the environment, and the damage may be dangerous and permanent.
- As the human population increases in size, the space allotted to natural ecosystems is reduced in size.
- Natural ecosystems are then no longer able to process and rid the biosphere of wastes, which accumulate and are called ‘pollutants’.
- Pollutants are substances added to the environment, particularly by human activities, that lead to undesirable effects for all living things. Human beings add pollutants to all parts of the biosphere - land, water and air.

What is human ecology?

Human ecology is the study of the relationship between humans and their natural, social, and built environments. It combines ideas and methods from several disciplines, including: Anthropology, Sociology, Biology, Economic history, Archeology.

- Human ecology is an approach to the study of human behaviour marked by two commitments.
- First, human ecologists think that humans should be studied as living *systems operating in complex environments.*
  - Human sciences are divided into several social science disciplines – humanistic, and human biological disciplines.
  - Ecologists attempts to understand how diverse parts of the system operate together to produce behaviour.
  - In a sense, traditional human science disciplines take people apart, while human ecologists endeavour to put us back together.
- Second, human ecologists think that humans are subject to very similar ecological and evolutionary processes as any other species.

Definition

- *Human ecology is the study of the interactions of humans with their environments, or the study of the distribution and abundance of humans*. [conventional definitions of biological ecology]
- **Human ecology** deals with the relationship between humans and their environment.
- Thus, using the term "human ecology" actually expresses a broad aspiration to understand human behaviour.

Factors affecting human population growth

- Agricultural revolution / food production
- Increase in knowledge of diseases
- Better health care and hygiene / sanitation
- Advances in Medicine and technology
- Resulting in a decrease in death rate, a longer life span, and an increased birth rate in some areas

NOTE: There has been a decrease in fertility rates in underdeveloped nations

Limiting Resources

- Renewable Resources
  - Can be replaced
  - Food supply, solar energy, wind/air, water, soil, living things (trees), geothermal energy, nuclear energy
- Non-Renewable Resources

  - cannot be replaced in one's lifetime

  - fossil fuels

Human Population Growth and the Environment

As the human population grows, we take up more space, consume more resources, and produce more wastes!

Disruption of Existing Ecosystems

- ***Urbanization*** Urbanization is the process of people moving from rural areas to urban areas, and the corresponding decrease in the proportion of people living in rural areas
  - Shift from rural (farming) areas to cities
  - Increased Industrialization
  - Destruction of farmland and deforestation
  - Results in
    - Decreased amount of space for other species
    - Loss of habitats
    - Decreased biodiversity
    - Disruption of ecosystem by introducing new species into an area w/no known predator

- The high level of industry and agriculture concentration and human economic activities lead to terrible situation that human life in many countries is ecologically dangerous.

- The pollution of environment (water pollution, air pollution, land pollution) has the bad influence to human health. That is why nowadays a new branch of ecological science begins to develop – it is ***human ecology***.

- In short, Human ecology is an academic discipline that deals with the association between humans and their natural environment.

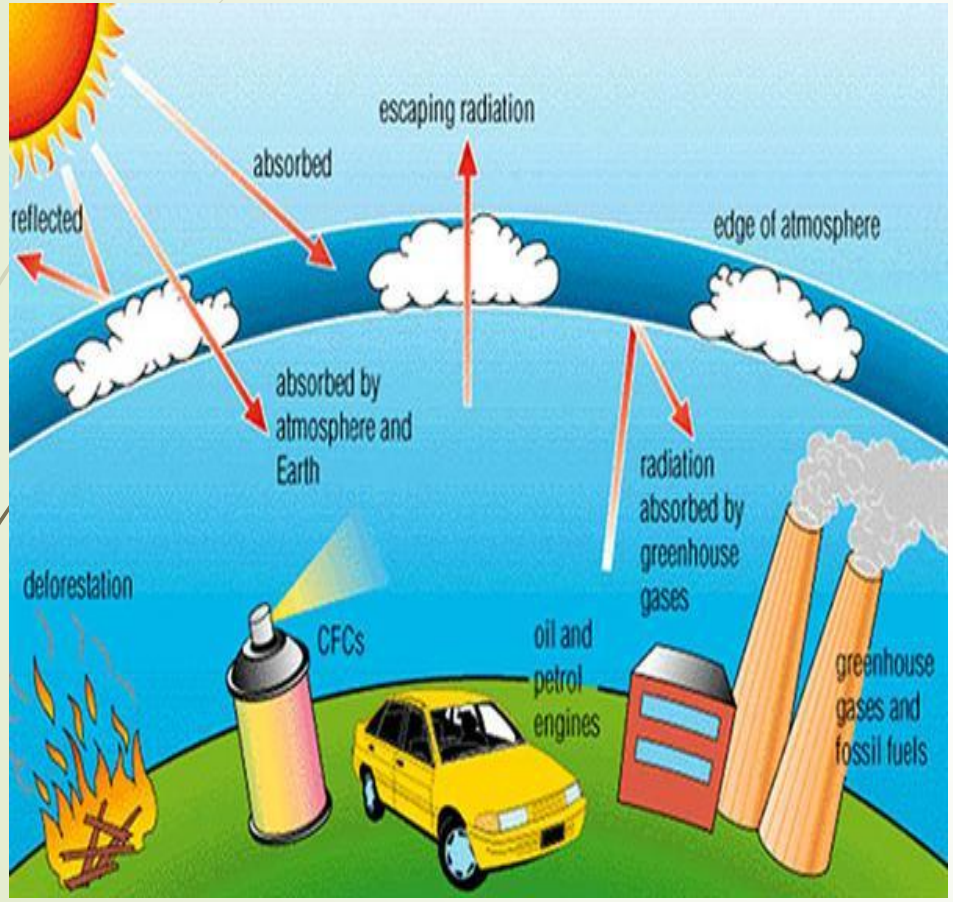
- Human ecology is about investigating how individuals and individual societies interrelate with nature and with their environment.
- It integrates knowledge from all academic disciplines and from personal experience to investigate, and ultimately improve, the relationships between human beings and our social and natural communities.
- Human ecology views human communities and human populations as part of the ecosystem of earth. It is the special ecology of the species *Homo sapiens*.
- Human ecology was established as a sociological field in the 1920's, although geographers were using the term much earlier.

Weather

- It can have different influence to human organism. It influences to human behavior and psychological condition.

For e.g. Many peoples suffer foehnic disease 1-2 days before the beginning wind weather

Global Warming



- An increase in the average temperature of the Earth's surface.
- The Earth has natural cycles of cooling and warming, but scientists believe that the Earth is warming faster than it should be.
- This increase in warming is thought to be caused by the **greenhouse effect** which is caused by a build up of certain gases in the atmosphere that trap heat in, such as CO_2, CH_4 (methane), and NO_2.

Water Pollution

- Water is the most spread nonorganic substance in whole world.
- It is the basis of all processes in alive organisms and it is the unique source of oxygen in the process of photosynthesis.
- The biosphere would not exist without liquid water.

Pollution

- Hydrosphere is polluted with human help.
- Industrial wastes includes heavy metals and organic chlorides, such as pesticides.
- These materials are not destroyed under natural conditions.
- So they accumulate in the bottom mud of deltas of highly polluted rivers and cause environmental problems.

Soil pollution

- The main sources of soil pollution are:
  - Industry;
  - Transport;
  - Agriculture.

For e.g. In agriculture people use pesticides and nitrates. These substances are very dangerous and toxic. They can cause mutations, cancer, pathological processes in central nervous system, respiratory and alimentary tracts, skin.

Soil erosion

- Poor farming practices have led to soil erosion.
- When crops are grown most of the plant parts are removed- nutrients are not returned to the soil.
- The fields become less fertile and are abandoned.
- Without vegetation topsoil is eroded by wind and rain and land becomes unusable.
- Overgrazing by animals also leaves land bare which leads to erosion.

Deforestation

- Human population poses a threat to the biosphere by habitat destruction, especially by the destruction of tropical rainforests (deforestation).
- This process is driving thousands of species to extinction each year and reducing biological diversity.

Farming Practices

- Over farming and over grazing
  - Result in areas without a cover of vegetation
  - No plants…no roots to hold soil
  - Leads to soil erosion: removal of soil by wind or water and desertification

Deforestation – can also lead to soil erosion, washing away of nutrients

- Fertilizers add nutrients to the soil in large quantities. If the crops don't use it all, where do the leftovers end up?
- Dams hold back water which can prevent soil erosion. What are some other consequences of building a dam?
- Making environmental impact decisions often involves **tradeoffs** – some harm is done in one area to gain something good in another.

The Value of Biodiversity

- Species diversity – the number of different species in a biosphere (E.g. Sacred groves)
- Genetic diversity – the sum total of all genetic differences
- Provide us with foods, industrial products, medicines, etc.

Threats to Biodiversity

- Habitat alteration
- Demand for wildlife products
- Pollution – biological magnification (ex. bald eagle and DDT)
- Introduced species – invasive species
- Loss of wetlands

Human-Environment Interactions

- Human ecology, most broadly defined as the study of human interactions with the environment, has in recent years gained greatly increased attention in – all of the social sciences.
- Despite this, there appears to be little consensus as to what human ecology actually is or should be. [In particular, there is continuing vigorous discussion about the suitability of applying several different theoretical approaches in understanding human-environment interactions]

Consensus: a general agreement

- Alternative conceptual models of human relations with the environment
- Classical and early modern theories of environmental influence on human affairs (determinism and possibilism) are often employed by historians. Most notable of such historians is Arnold J. Toynbee, who advocates a possibilist stance in his influential *A Study of History* (1934-61).

Origins of Human Ecology

- Since ancient times there have been many attempts to explain events in terms of environmental influences on human behavior.
- Ancient Greek philosophers recognized that man was both influenced by nature and a force for change in the environment.

For example, the different forms of political organization of the Greek city states and the Eastern empires reflected the influences of climate on the personalities of their citizens.

- This theme [human ecology] was later developed by Montesquieu and other French writers of the Enlightenment and advocated in recent times by the American geographer Samuel Huntington.
- Other classical writers commented on the destruction of the natural landscape of Attica and North Africa resulting from deforestation and overgrazing, a theme taken up in the mid-1800s by George P. Marsh, whose book, *Man and Nature, or, Physical Geography as Modified by Human Action* was a precursor of the ecological catastrophe writings so popular recently.

Human Ecology Approach of the Classical Chicago School

- Human ecology took its birth in the first quarter of the Twentieth century in the Urban studies of the "Chicago School" whose leading representatives were Robert E. Park, Earnest W. Burgess, and R.D. Mckenzi.
- They extensively used concepts and principles developed by plant and animal ecologists and focused their study on spatial aspects of community life.
- Park, the founder of the Chicago School, regarded human ecology as the study of the forces at work within the units of Urban community - within the limits of any natural area of human habitation, in fact - which tend to bring about an orderly and typical grouping of its population and institutions".

In simpler terms, this line means that human ecology is the study of the factors that influence how people and institutions in urban communities are organized in a predictable and structured way. It aims to understand why certain groups of people and organizations are located where they are within a city or town.

- Thus human ecology was concerned with the territorial arrangements that social activities assume in order to discover and explain the regularities appear in man's adaptation to space.
- In the area studies of Chicago school, "community became the central concern. They regarded human community as sub-social and sub-cultural entity, belonging to the 'natural order' like biotic plant and animal communities.
- Also the emphasis was laid on ·competition', as in biological ecology, rather than on 'cooperation' among community members".

Hawley's theory of Community Structure

- A. H. Hawley found the Human Ecology approach of the Chicago school 'incompatible with the fundamental logic of ecological theory'.
- We find in Hawley's approach the inclusion of social aspects of human community, the aspects of the competition and cooperation and reduced emphasis upon social structure spatial patterns.
- Another merit of Hawley's theory is his emphasis upon man's possession of culture. Hawley was concerned with technology and social organization which he regarded as the aspects of culture.
- He asserted man's possession of culture and its potentiality to modify the environment recognizing thereby the essential difference between human ecology and biological ecology which his predecessors failed to make out.
- Hawley defined human ecology as "the study of the form and development of the community in human population". By community, he meant the functional system of relationship of a territorially based population.

Theoretical approach

- The first theoretical approach to be tried, however, was that of ***environmental determinism***—a false start that greatly retarded subsequent development of human ecology.
- Geographers Friedrich Ratzel in Germany and his American disciple, Ellen C. Semple, espoused the view that humans were completely the product of their environment, a theory that came to be called environmental determinism.

For example, the Eskimos were primitive nomads *because* the harsh conditions of their arctic habitat forbade their development into a complex civilization.

Environmental determinism

- A deterministic approach assigns one factor as the dominant influence in explanations.
- Environmental determinism is based on the assumption that cultural and natural areas are coterminous, because culture represents an adaptation to the particular environment (Steward 1955:35).
- Therefore, environmental factors determine human social and cultural behaviours (Milton 1997).

Cont.

- Determinism lays emphasis on the philosophical position that people have about the relationship between man and nature.

- Environment determines human conditions as according to determinism. In other words, the human behaviour, life styles and the economy of living are conditioned by the environment.

Cont.

- Determinism gives maximum emphasis on the value of nature. In contrast, free-will approach lays emphasis on human capacity and potential. It holds that man has a free-will capacity to challenge and change the power of the nature (e.g. storm, flood, drought etc).

- Man can modify the force of environment through technology. Here comes the importance of human consciousness, which signifies man's active involvement in the management of the environment.

- Although seductive when first encountered, such claims of causal correlation between environment and culture were easily refuted once given careful consideration.

For example, the Tasmanians, who lived on an island not unlike the one inhabited by the English, made no ships.

- Therefore, there is simply too much variation in human behavior in seemingly similar geographical settings for it *to* be environmentally determined.

Environmental Possibilism

- The proponents of **environmental possibilism** asserted that while the environment did not directly cause specific cultural developments, the presence or absence of specific environmental factors placed limits on such developments by either permitting or forbidding their occurrence.

For example, island peoples could be seafarers, but residents of Inner Mongolia could not be; inhabitants of temperate regions might practice agriculture, but those living in artic latitudes could not.

- American anthropologist A. L. Kroeber, showed that the Indians of northwestern North America could not adopt maize agriculture from their southern neighbors because the frost-free growing season in their region was shorter than the four months required for the maize plants to reach maturity.
- Their environment thus limited the ability of their culture to evolve in an agricultural direction.
- A possibilist stance was also taken by the British historian Arnold Toynbee in his multi volume *A Study of History* (1947), in which he argued that the development of civilizations could be explained in terms of their responses to environmental challenges.

- Those in extremely harsh habitats such as the Eskimos in the arctic remained forever primitive because simply coping with the demands of their environments sapped all of their creative energies.
- Only those secure cultures in environments offering sufficient but not excessive challenges had the possibility of progressing to higher stages of civilization.
- British anthropologist Daryll Forde concluded in his book, *Habitat, Economy and Society* (1934), which was perhaps the last major scientific exploration of possibilism, "between the physical environment and human activity there is always a middle term, a collection of specific objectives and values, a body of knowledge and belief in other words, a cultural pattern."