Human Ecology

Components of the Environment

Ecological Concepts

Dr Njideka E. Kanu

The Human Environment

- Human environment implies all the external factors (living and non-living) which surround man

Components of the Environment

Environment is divided into 3 components:

- Physical Environment
- Biologic Environment
- Social Environment

Physical Environment

- Comprises the non-living part of the environment eg
- Water
- Air
- Soil
- Housing
- Wastes, radiation, etc.

Biologic Environment

- Biologic Environment includes all living organism (plant and animal life) including
- Bacteria
- Viruses
- Insects
- rodents

Social Environment

- Social Environment: is that part of the environment which plays a prominent role in determining the mental health of man and includes all the conditions affecting man as a member of the society
- Eg Culture, Habits, Income, beliefs and attitudes, Occupation, housing, educational systems, religion etc

Environmental Sanitation

This deals with the following areas:

- Water- provision of safe and adequate supply of water
- Waste – proper disposal of solid waste
- Sewage – proper sewage disposal and treatment
- Food – safeguarding of food (Food Hygiene)
- Housing – provision of good housing
- Insect Vectors – control of insect vectors and pests
- Air – control of atmospheric pollution
- Other Hazards – Elimination of noise, radiation etc

Ecological Concepts

OBJECTIVES

- Examine certain terms used in the study of human ecology in relation to Community health
- Discuss Ecological factors in disease distribution
- Consider a conceptual framework for studying human ecology

Terms Used in Human Ecology

- Ecology
- Human ecology
- Ecosystems
- Ecological homoeostasis
- Health status

Definition of Terms (1)

- **Ecology:**

  The science of mutual relationship between organisms living in a defined space and their patterns of adoption to their environment

Human Ecology

- The interrelated, complex interactions that exist between man and his environment
- Effects of man-environment interactions
- The etiology or causal evolution of health and disease (population genetics, physiology, immunological and nutritional status of the population)
- Human Ecology is a subset of the general science of ecology

Human ecology of diseases

The interaction between human behavior (cultural and socio-economic context) with environmental conditions to protect or prevent disease among susceptible people

Ecosystem

- The human Ecosystem includes the natural environment and all the dimensions of the man-made environment – physical, chemical, biological, psychological including our culture and all its products.
- Disease is embedded in the Ecosystem of man

Ecosystem(2)

A functioning interacting system, composed of one or more living organisms and their effective environment, both physical and biological and its basic reserves of matter and energy, its pattern of circulation of matter and energy; the nature of its income (input) of matter and energy; and the behavior or trend of its entropy level (Fosberg, 1967)

Ecological Homeostatis

- Homeostatics (Gr: homois – ‘similar’ and statis – ‘state’ or ‘standing’) can be represented as a dynamic maintenance of assigned values, parameters, functions and trends of development or decay
- Ecosystems in a steady state that possess the property of self-regulation (action and reaction)
- Similar in principle to a wide range of mechanisms, such as homeostatic in living organisms

Health Status

- Health according to ecological concepts, is a state of dynamic equilibrium between man and his environment
- Health status is related to the ecology (natural environment) within which people interact and carry out their activities, human settlements and amenities available

Four Main Properties of Ecosystem

- The term/property, ‘Monistic’ i.e., man and environment are brought together in a single framework
- Ecosystems are structured in a more or less orderly, rational and comprehensible way
- Ecosystems functions involve continuous through-put of matter and energy
- Ecosystems are a part of general system

Ecological Factors in Disease Distribution

- Many diseases result from an interaction between the host and the environment
- Man-made alterations to the environment can cause changes which favour certain diseases
- By constantly altering his environment or ecosystem by urbanization, industrialization, deforestation, construction of irrigation canals, man has created new health problems
- Ecological factors are therefore at the root of geographic distribution of disease

Ecological Factors in Disease Distribution

- Eg disease agents such as malaria which were previously controlled have shown a recrudescence
- Occurrence of zoonotic diseases such as rabies, yellow fever, lassa fever, monkey pox
- Construction of irrigation systems and artificial lakes has created ecological niches for breeding of mosquitoes and snails causing increased occurrence of malaria, onchocerciasis and schistosomiasis etc

Ecological Factors in Disease Distribution

- Communicable diseases are now being replaced by non-communicable diseases in developing countries
- New sources of pollution, eg motor vehicles and chemical industries are responsible for new environmental problems
- The depletion of ozone layer by flue gases into the atmosphere poses serious environmental health problems globally

Conceptual Framework

The Tripod of the Interrelationship:

- Habitat (Environment)
- Population
- Behavior (Culture)

Environment/Habitat

Environment/Habitat – elements of physical and biologic environment;

i) The Built Environment

ii) Health Services

iii) Physical Environmental Factors

iv) Economic Determinants

Population – characteristics and health status

- Demographic characteristics (age structure, sex, education/literacy, marital status, race, ethnicity, etc)
- Population status - the genetics
- Human biochemical system

Human Behaviour

- Covers activities of man that affect disease ecology
- Behavior exposes individuals and populations to some hazards and protects them from others
- People move from one place to another; hence, diseases spread
- Behavior affects quality of population by controlling genetics such as through marriage customs, nutritional status, food customs , customs of deliberate childhood exposure to immunization etc

Thank You