

COMMUNITY HEALTH AND ENVIRONMENTAL SYSTEM

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Learning Objectives

By the end of this learning session, students should be able to:

- Describe the meaning of environment, its types and components
- Discuss the common health problems related to environment



Introduction

The Earth, the air, the land and the water are not an inheritance from our fore fathers but on loan from our children. So we have to handover to them, at least, as it was handed over to us.

-Mahatma Gandhi



Definition of Environment

The simple definition of environment is the 'surrounding' (that surrounds living beings)

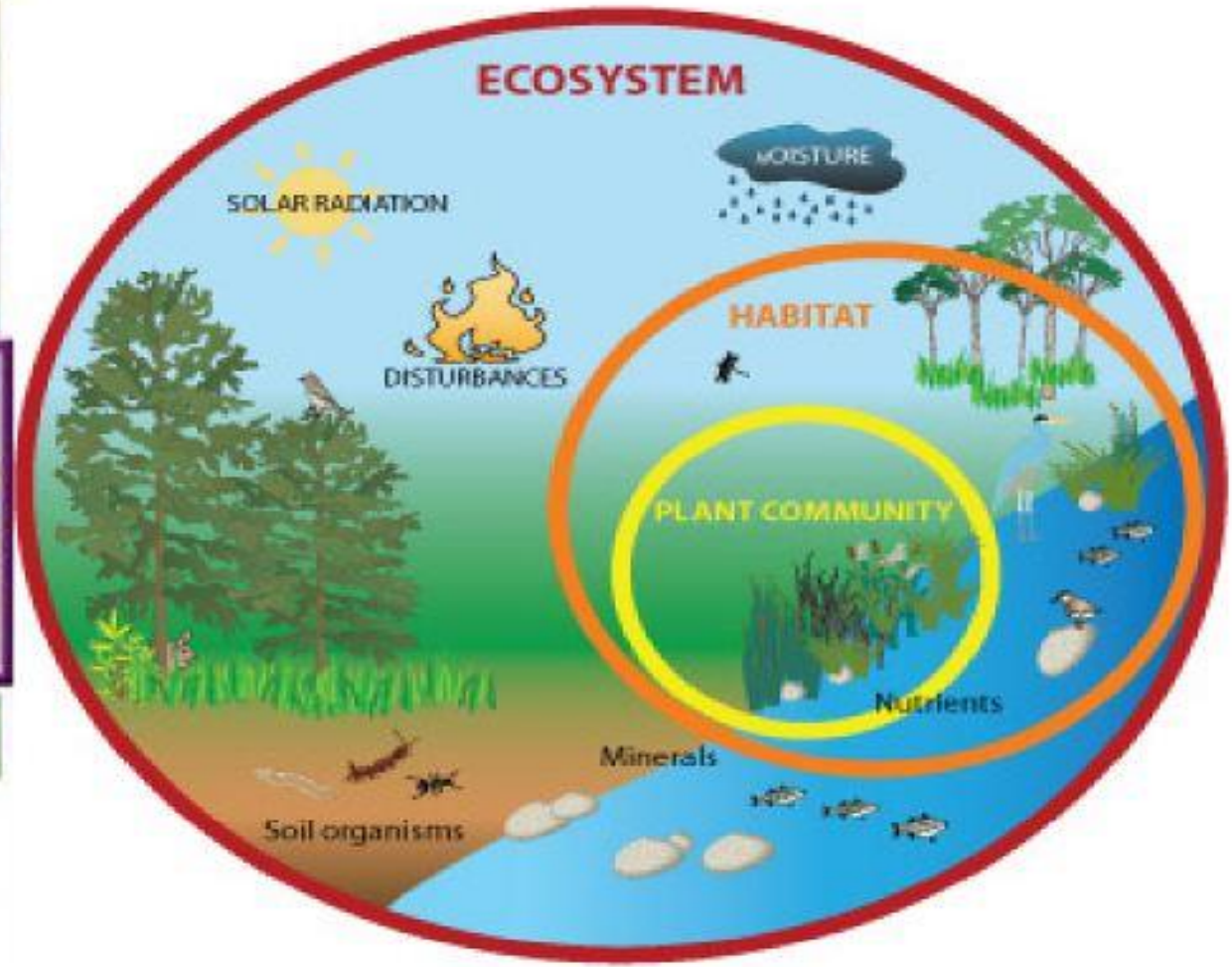
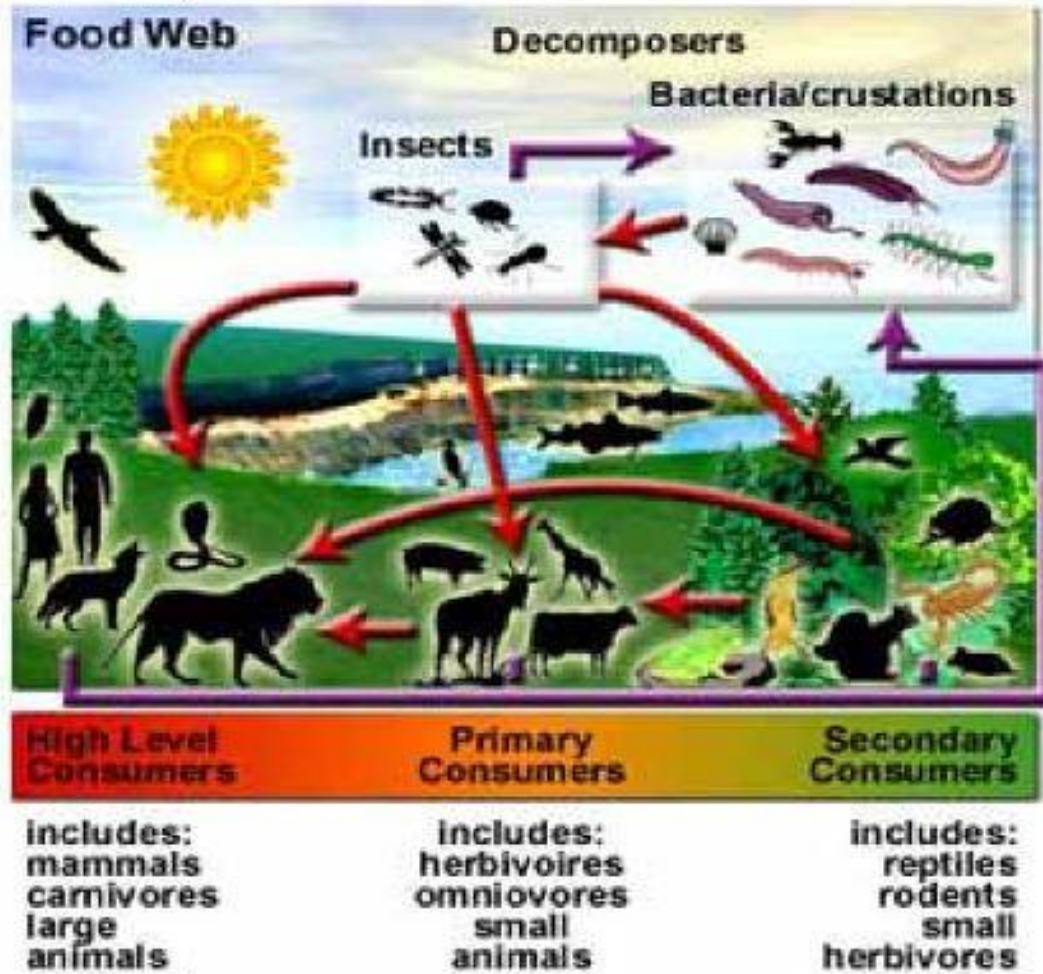
It is the combination of all physical and organic factors that act on a living being, residents, or ecological society

The physical environment or abiotic environment includes the built environment, natural surroundings like air, water, land and atmosphere

People surrounding the items or things are referred to as human environment. This also known as the social environment and includes elements like the religious environment, emotional space, and relation is

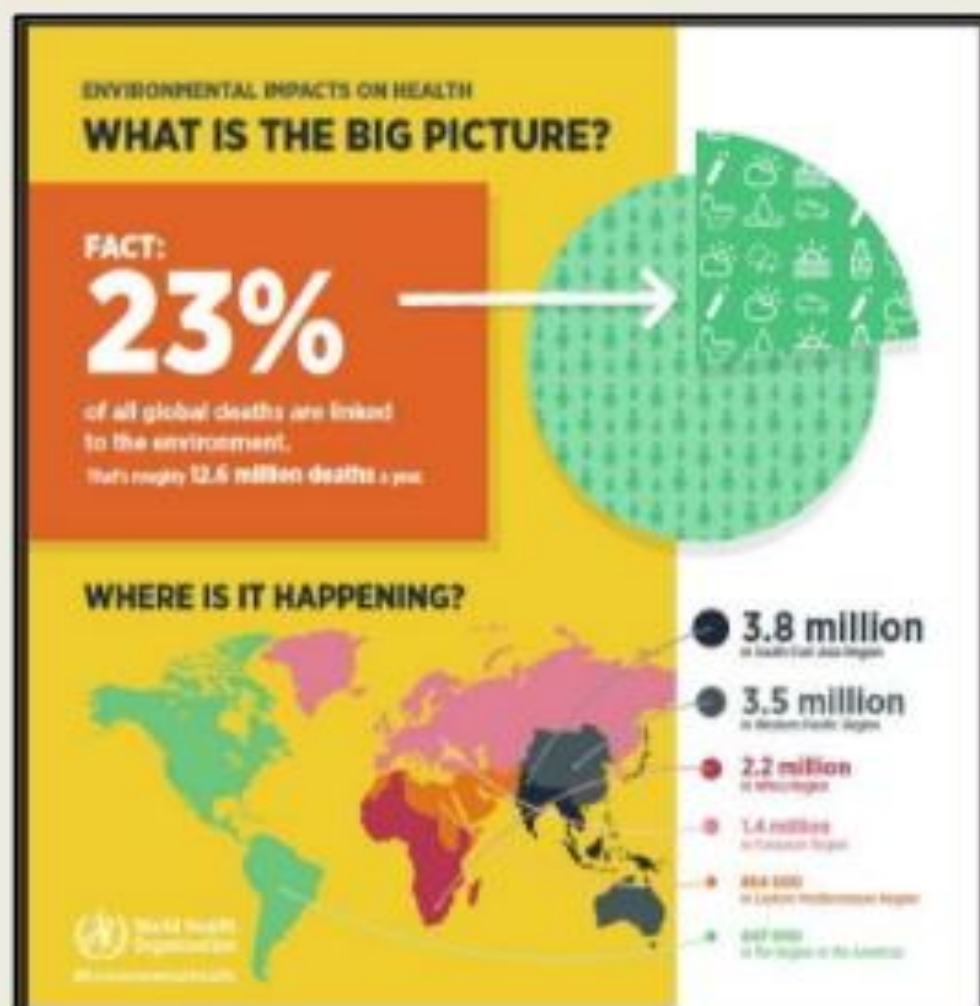


Environment



Why to Study Environmental Health?

- According to WHO, an estimated 12.6 million people died as a result of living or working in an unhealthy environment in 2012 – nearly 1 in 4 of total global deaths are because of environmental health.
- By focusing on reducing environmental and social risk factors, nearly a quarter of the global burden of disease can be prevented.



TOP 10 CAUSES OF DEATH FROM THE ENVIRONMENT

8.5 million out of **13.7 million** deaths caused by the environment are due to noncommunicable diseases

1st
ISCHAEMIC HEART DISEASE
2.4 million

2nd
CHRONIC RESPIRATORY DISEASES
1.9 million

3rd
CANCERS
1.8 million

4th
UNINTENTIONAL INJURIES
1.5 million

5th
RESPIRATORY INFECTIONS
1.5 million

6th
STROKE
1.5 million

7th

DIARRHOEAL DISEASES
829 000

8th

DIABETES
391 000

9th

MALARIA
355 000

10th

NEONATAL CONDITIONS
244 000



World Health Organization

#EnvironmentalHealth

Types and Components of Environment

- **Physical environment**
 - Atmosphere (Air)
 - Hydrosphere (Water)
 - Lithosphere (Land)
- **Biological environment**
 - Flora (Plants)
 - Fauna (Animals)
 - Microbiota (Microorganisms)
- **Cultural Environment**
 - Society
 - Economics
 - Political



Physical Environment

- It is also known as abiotic or natural environment
- Abiotic refers to 'non-living' such as land, water, air etc.
- Physical or abiotic environment also includes the climatic factors such as sunbeams, rainwater, precipitation, moisture, pressure, and wind speed



Importance of Physical Environment

- One of the most important requirements of building a house is a residential space/land area. The land area is included in the physical environment.
- Abiotic environment such as soil, water, and air provide the necessary nutrients for living beings
- Abiotic environment also controls climatic factors such as weather
- All living beings are surrounded by atmosphere; a combination of different types of gases. Living beings obtain oxygen and other gases from the atmosphere
- The physical environment also included the soil which is responsible for the food crops and different minerals that are required by living beings
- Water is one of the most important substances required by living beings, nearly all forms of life depend on water to survive. Water also makes up about 70% of the physical environment



Biological Environment

- Also known as biotic or organic environment
- The biotic or biological environment constitutes the living part of the earth



Importance of Biological Environment

- The biotic environment includes plants, animals, underwater creatures, microorganisms etc.
- An important concept to understand is that living beings are highly dependent on each other. Example humans and plants depend on each other for food and nutrients



Social or Cultural Environment

- This type of environment involves the culture and lifestyle of the human beings
- The social or cultural environment means the environment which is created by the man through his different social and cultural activities
- The historical, cultural, political, moral, economic aspects of human life constitute the social or cultural environment.
- Culture involves the religion, traditions, norms, and values of people
- The social or cultural environment affects the social culture of human beings and hence it is of great importance
 - The development of a child is highly dependent upon culture and society



Environmental Health

- Environmental health is concerned with assessing, controlling, and improving the impact people make on their environment and the impact of the environment on them
- The field of environmental health is concerned with all those elements of the environment that influence people's health and wellbeing. The conditions of workplaces, homes, or communities, including the many forces- chemical, physical, and psychological present in the environment that affect human health are important considerations
- Environmental health replaced the term sanitation and it has been defined as “the aspect of public health concerned with all the factors, circumstances and conditions in the environment or surroundings of humans that can exert an influence on human health and wellbeing



Environmental Health Cont'd

- Different environments pose different health problems and benefits. Consider the effects of acid rain, soil erosion, and insect invasions on a rural community or the effects of industrial toxic wastes, auto emissions, and airport noise on urban residents.
- The health effects of a hot, dry climate are different from those of an arctic area, and the environmental conditions of an industrialized nation are dramatically different from those of a developing country.



Environmental Health Issues

- These environmental health issues affect public health because the cause for many illnesses related to environmental hazards overlap.
- Many of the same contaminants are found in the air, soil, and water, so pinpointing a definitive reason for the associated medical conditions is not always possible.
- E. Coli and severe acute respiratory syndrome (SARS) serve as examples of outbreaks that are passed to humans, through food and air causing serious environmental health issues.
- An outbreak of disease caused by the environment threatens public health. As a result, government agencies often become involved with local and regional governments to address effective ways to reduce or eliminate the threat.



Environmental Hazards

Psychological hazards

- I. Are environmental factors that produce psychological changes expressed as stress, depression, hysteria
- II. Physical hazards: include airborne particles, humidity, equipment design and radiation e.g. Skin cancer due to UV exposure
- III. Sociological hazards
 - Are those that result from living in a society where one experiences noise, lack of privacy and overcrowding.
 - Population growth may be a sociological hazard.
When environmental resources can support no further growth, the population has reached the equilibrium phase and the environment is said to be at its carrying capacity



Environmental Hazards Cont'd

- IV. Political hazards: political disruptions such as terrorism, riots, coups, civil wars, international wars, and even political elections that may change the ruling government, can dramatically affect businesses' ability to operate.
- V. Economic hazards: inflation, the behavior of one party may change to the detriment of another after the transaction has taken place. For example, a person with insurance against automobile theft may be less cautious about locking their car because the negative



Environmental Health and Safety

- The health status of the individual or community is determined by the interactions of the internal and external environments surrounding that individuals
- The factors that influence the health of the people will include food, water, housing, clothing and sanitation
- There are major global environmental concerns now facing the world, including overpopulation, ozone depletion and global warming, deforestation, wetlands destruction, desertification, energy depletion, inadequate housing, aesthetics, and environmental justice issues.



Overpopulation

- Uncontrolled population growth is indisputably a public health issue.
- The world's population is still increasing by more than 80 million people per year
- The burden of the population growth is being carried by the poorest developing countries, such as in Africa and India, where 90% of the growth is occurring.
- In some nations, the population is projected to shrink. If low fertility rates continue in countries their populations will decrease by 5% to 15% by the year 2025.
- In contrast, countries such as Uganda have high fertility rates, and it is likely that their populations will more than double over the same period



Nursing Role- Overpopulation

- Community health nurses, have a responsibility in the area of overpopulation, both globally and locally. Productive interventions include the following:
 - (1) teaching families that birth spacing improves child and maternal survival and that a planned family is the best environment for a child's development;
 - (2) Preventing high-risk pregnancies such as those among teens
 - (3) Preventing the growing epidemic of HIV/AIDS;
 - (4) Providing family planning education to prevent worldwide deaths from unsafe abortions;
 - (5) Providing prenatal care—because healthy mothers equal healthy children. These are key areas in which public health efforts can reap major rewards for families.



Air Pollution

- For many centuries, people have known that air quality affects human health.
- Pollution refers to the act of contaminating or defiling the environment to the extent that it negatively affects people's health.
- Air pollution is now recognized as one of the most hazardous sources of chemical contamination.
- It is especially prevalent in highly industrialized and urbanized
- areas where concentrations of motor vehicles and industry produce large volumes of gaseous pollutants.
- Air pollution is a global problem.



Air Pollution Cont'd

- Airborne pollutants have adverse effects on many areas of human life; productivity, quality of life, and especially human health are enormous.
- The list of diseases and symptoms of ill health associated with specific air pollutants is lengthy, ranging from minor nose and throat irritations, respiratory infections, and bronchial asthma to emphysema, cardiovascular disease, lung cancer, and genetic mutations
- As with other toxic chemicals, it is often difficult to establish a cause-and-effect relationship between air pollution and illness.
- Certain geographic areas are more susceptible to the ill effects of air pollution because of weather conditions or physical terrain.



Nursing Role- Air Pollution

- Community health nurses can influence air quality through detection, community education, and lobbying for appropriate legislation.



Water

- Water is such an essential element to human survival that the available quantity and quality of water within a community has become a prime environmental health issue. Water has many uses other than consumption by humans. It serves as a means of transportation. It cleans and cools the body or other objects.
- It is the basis for many forms of recreation and sports, such as swimming and boating, and it provides a vehicle for disposing of human and industrial wastes and controlling fires. Apart from serving human needs, water also acts as a medium for sustaining other living organisms, as a home to plant and animal life, and as a means of carrying and distributing necessary nutrients in the environment.



Water Pollution

- Water can be contaminated and made unsafe for drinking in many different ways. Three are discussed here
- Water may be infected with bacteria or parasites that cause disease. *Giardia lamblia* is a parasite that enters the water supply through contamination from human or wild animal feces.
- Toxic substances such as pesticides are introduced by humans into water systems and constitute another form of water pollution.
- Pollutants may upset the ecosystem, affecting natural organisms that help purify water systems. Power plants or other industries dissipate excess heat into lakes and streams and cause water temperatures to rise.
- This thermal pollution kills off beneficial organisms in the water.

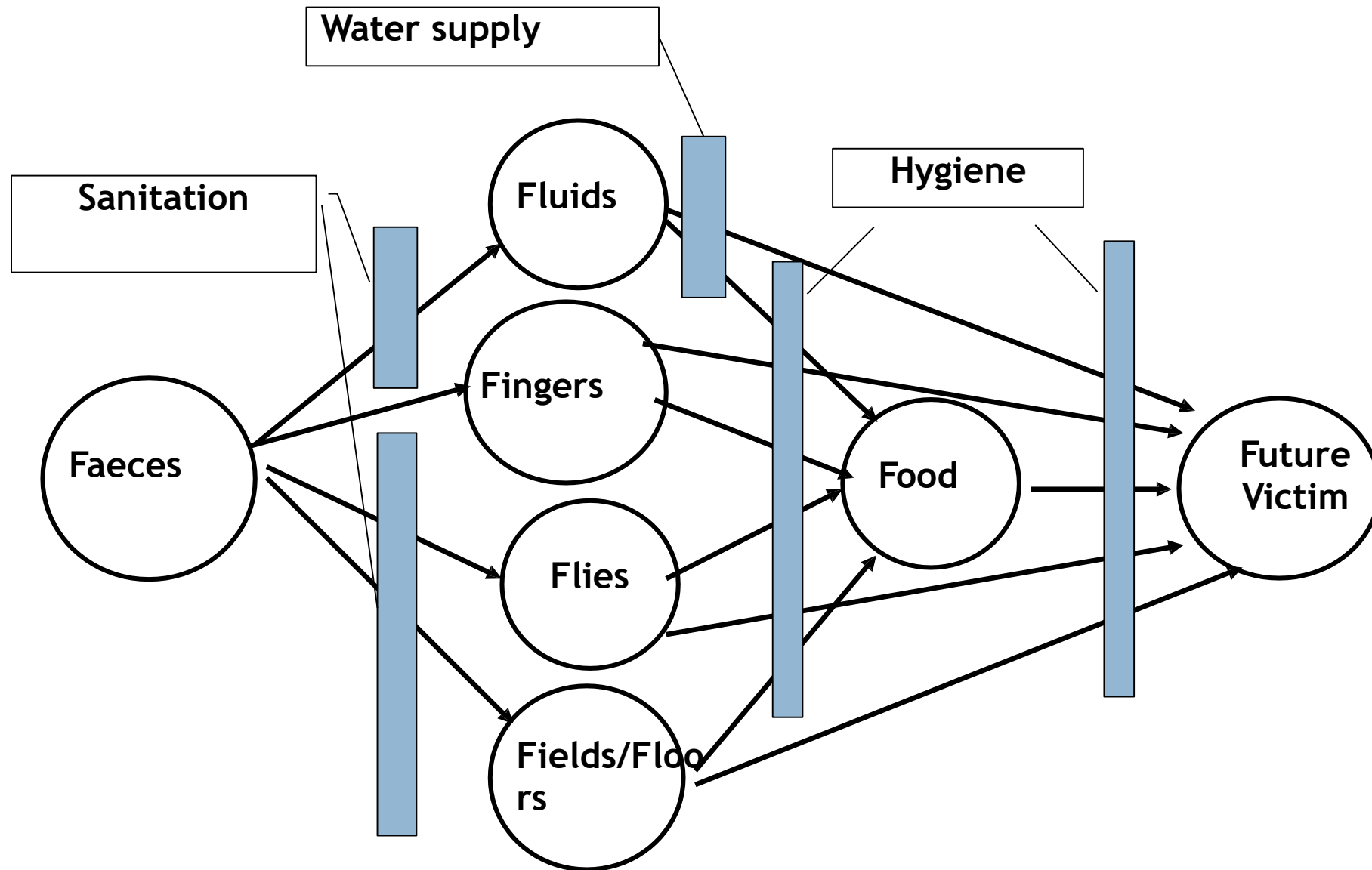


Nursing Role- Water Pollution

- Although nursing's environmental health role concerns the safe consumption of water by humans, it is important, taking an ecologic perspective, to keep in mind water's other uses and users.
 - They can help by examining household or city drinking water.
 - Asking clients to observe and report changes in water quality further assists the nurse in the monitoring process.
 - Community health nurses can also be alert to increased incidence of illnesses that might be water related



The F-diagram



Deforestation, Wetlands Destruction, and Desertification

- Deforestation is the clearing of tropical and temperate forests for cropland, cattle grazing, or urbanization.
- Elimination of these natural habitats is dooming some species of insects and animals to extinction, the loss of a species from the earth forever.
- Wetlands are natural inland bodies of shallow water, such as marshes, ponds, river bottoms, and flood plains, that filter contaminated surface waters and support wildlife reproduction and growth.



Nursing Role- Deforestation, Wetlands Destruction, and Desertification

- Community health nurses can make a difference in this area. Perhaps no other person knows a community more intimately than the community health nurse.
- This role gives a valid voice of concern at the local level. By using leadership and collaborative skills, the nurse can initiate grassroots efforts to save wetlands and forests in the community.



Inadequate Housing

- Housing is of central importance to quality of life. Ideally, it minimizes disease and injury and contributes much to physical, mental, and social well-being.
- At least 600 million urban-dwelling people in Africa, Asia, and Latin America live in life- and health-threatening homes and neighborhoods. Most live in overcrowded dwellings, with four or more persons to a room in tenements, cheap boarding houses, or shelters built on illegally occupied or subdivided land



Nursing Role- Inadequate Housing

- In this area of environmental health and safety, the community health nurse has great influence. Much of the nurse's commitment to the community focuses on assessment, planning, intervention, and evaluation of a client's home and surrounding environment.
- The role may call for client education about home improvements, advocacy for routine maintenance of rental housing conditions, or assistance to clients who live on the streets or in shelters so that they can locate and secure more permanent and adequate safe housing



Unhealthy or Contaminated Food

- This section describes how the supply of food, particularly the quality of that food, is affected by the environment, and what health hazards are associated with food. The community health nurse needs to ask: “How does the environment influence the safety of food for human consumption?” Three types of hazardous foods must be considered when examining food as a possible health problem:
 - Inherently harmful foods,
 - contaminated foods,
 - and foods with toxic additives.



Nursing Role- Unhealthy or Contaminated Food

- Community health nurses can have a significant impact through health education.
- Most bacterial and viral foodborne diseases can be prevented if people know and practice proper cooking and storage of food as well as proper personal hygiene



Poor Waste Disposal



- With the vast amounts of waste produced in the form of household garbage, human excreta, and agricultural and industrial by-products, including hazardous chemical and radioactive substances, it is no wonder that waste management and disposal has become an important and pressing topic in recent decades.
- New technology has effectively addressed some of the problems, but there is still much need for improvement. Solid and hazardous wastes pose a wide range of public health concerns. Therefore, it is imperative that health officials, including community health nurses, become aware of the possible health hazards that these wastes present to individuals and to communities.



Waste Disposal Cont'd

1) Disposal of Human Waste

- One of the oldest environmental health hazards comes from improper disposal of human excreta. Although industrialized nations have successfully addressed the problem, it continues to be widespread in developing nations and in rural, poverty stricken communities.
- Human wastes, particularly feces, provide a perfect environment in which bacteria and disease-causing parasites can live and reproduce. Therefore, contaminated drinking water, food grown in contaminated soil, and, of course, direct contact with the contaminated water or soil can cause infections.



Waste Disposal Cont'd

2) Disposal of Garbage

- Dumping, burning, and burying are the most common solid waste disposal methods. Dumping is problematic, because garbage dumps provide perfect conditions for the breeding of rats, flies, and other disease-carrying organisms and may potentially be a source of water contamination from runoff.
- Dumps also take up valuable land resources. Burning, although it reduces the volume of garbage, produces noxious odours and pollutes the air.



Waste Disposal Cont'd

3) Disposal of Hazardous Waste

- Disposal of toxic chemical and radioactive wastes produced by industry is another grave concern. The threat is serious, because one cannot be certain of all of the effects of these wastes or whether present methods of disposal are foolproof.
- Furthermore, many of these wastes escape containment or accidentally leak into water systems and into the soil to contaminate drinking water and food.



Nursing Role- Waste Disposal

- Community health nurses can encourage the positive actions described by educating the public and lobbying for enabling legislation.
- Nurses can promote greater sensitivity among citizens to the problems of accumulating waste with its potential health hazards, encourage clients to buy products that can be recycled, and discourage use of aerosol spray containers, plastics, and other non-recyclable items.
- Such information sharing occurs during home visits when conducting family and home assessments; during group educational opportunities that arise in apartment complexes or neighborhoods where several families are being served; with school children when the community health nurse is invited into the classroom by the teacher; or in conjunction with environmental health services when a community is blighted by waste management problems and the nurse speaks to groups of parents, teens, or children.

The possibilities are limited only by the nurse's imagination, priorities, community connections, and time constraints.



Insects and Rodents Control

- All human communities are affected by the insects and rodents living in their environment. On the least dangerous level, they can cause irritation (eg, mosquito or flea bites) and discomfort (e.g. infestations of bedbugs or lice).
- They can also pose a direct threat to health through such things as attacks by diseased rats or squirrels. Insects and rodents can consume and, in turn, contaminate food. However, by far the most serious health hazard they impose is through their role as vectors, nonhuman carriers of disease organisms that can transmit these organisms directly to humans.



Insects and Rodents Control

Cont'd

- The most common vectors are mosquitoes, flies, ticks, roaches, fleas, rats, mice, and ground squirrels. All of these vectors can serve as reservoirs for germs that they then transmit through physical contact with humans or by contaminating human foodstuffs or water.
- Cases of vector-spread diseases range from the 14th-century bubonic plague epidemic spread by rat fleas, which killed a quarter of the European population, to the mosquito-spread outbreaks of West Nile virus that began in New York in 1999.



Nursing Role- Insects and Rodents Control

- Some of the simple changes families can make that will help to eliminate rodents and insects include the following:
 - Ensure that screens exist on all open windows, and use screen doors.
 - Wash dishes, pots, and pans after meals, and clean counter surfaces.
 - Keep pet food off the floor; fill the pet dish when the pet eats, and do not leave it on the floor for extended periods.
 - Keep foodstuffs that insects may infest, such as cereals, corn meal, and flour, in closed plastic containers.
 - Ensure that doors and windows fit properly; use caiking if the outside can be seen through gaps in doors or windows.
 - Keep floors swept and vacuumed in rooms where people eat, to eliminate food supply for rodents and insects; preferably, eat only in the kitchen or dining room.
 - Remove trash bags that include food scraps and food packaging from the home daily and place in garbage containers that are kept outside and have tight-fitting lids



WE CAN IMPROVE OUR ENVIRONMENT TO IMPROVE OUR HEALTH

These WIN-WIN
strategies are
fundamental
to achieving the

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD



World Health
Organization

#EnvironmentalHealth



1. Apply low **carbon strategies** in energy generation, housing and the industry.



2. Use more active and **public transportation**.



3. Introduce **clean fuels** for cooking, heating and lighting and clean technologies.



4. Reduce **occupational exposures** and improve working conditions.



5. Increase **access to safe water** and adequate sanitation and promote hand washing.



6. Change **consumption patterns** to lower the use of harmful chemicals, minimize waste production and save energy.



7. Implement interventions that can increase **sun protective behaviour**.



8. Pass **smoking bans** to reduce exposure to second-hand tobacco smoke.



9. Always use a **health in all policies** approach to create healthier environments and prevent disease.

Let's all work towards a healthier
environment for our health.

Only when the last tree has been cut down, only when the last river has been poisoned, only when the last fish has been caught, only then will you realise that money can not be eaten...

References

- Trochim, W., Cabrera, D., Milstein, B., Gallagher, R., & Leischow, S., (2006). Practical challenges of systems thinking and modeling in public health. American Journal of Public Health, 96(3), 538-546.
- WHO, (2012); <https://www.who.int/phe/PHE-prevention-diseases-infographic-EN-2-1200px.png?ua=1>