EWCE 333
Wastewater Engineering and Sanitation

Lecture 1

Instructor

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Lecture details

Topics	References
• Water, sanitation and health • Objectives of environmental sanitation • Classification of Wastes	1. Water Supply and Sanitation- Feroz Ahmed and Mujibur Rahman ITN - BUET

Environmental Sanitation

According to WHO (World Health Organization, 1950), environmental sanitation refers all condition that affect health, including –

- the control of water supply, excreta and wastewater disposal,
- refuse disposal,
- housing condition,
- food protection,
- atmospheric conditions and
- the safety of the working environment.

Definition of Sanitation

Sanitation may be defined as the science and practice of effecting healthful and hygienic conditions and involves the study and use of hygienic measures such as:

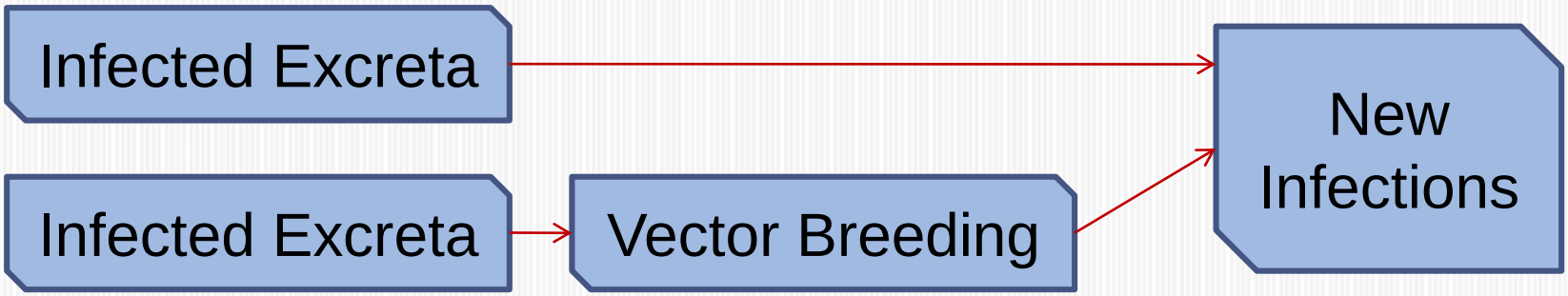
- Safe, reliable water supply;
- Proper drainage of wastewater;
- Proper disposal of all human wastes;
- Prompt refusal of all refuse.

Objectives of Sanitation

The principal objectives of providing sanitary facilities are:

- To have improved public health
- To minimize environmental pollution

Transmission of diseases



Direct way:

Pathogens in the excreta of an infected person reach another person and initiate infection. These are the excreted infections.

Indirect way:

Infection in other persons are caused by transmission of excreted pathogens via insects such as flies and mosquitoes and rodents such as rats, which act as vectors.

Effects of Sanitation

Sanitation prevents infection, which may occur in different forms through different transmission media such as:

- Ingestion of food or drinking water contaminated with faeces
- Ingestion of beef infected with tapeworms
- Contact with contaminated water
- Contact with contaminated soil
- Insect vectors

Water, Sanitation and Health

- Improvement of health is not possible without sanitary disposal of human wastes.

- However, neither sanitation nor water supply alone is good enough for health improvement.

- Health education or hygiene promotion must accompany sufficient quantities of safe water and sanitary disposal of excreta to ensure the control of water and sanitary related diseases.

Water, Sanitation and Health

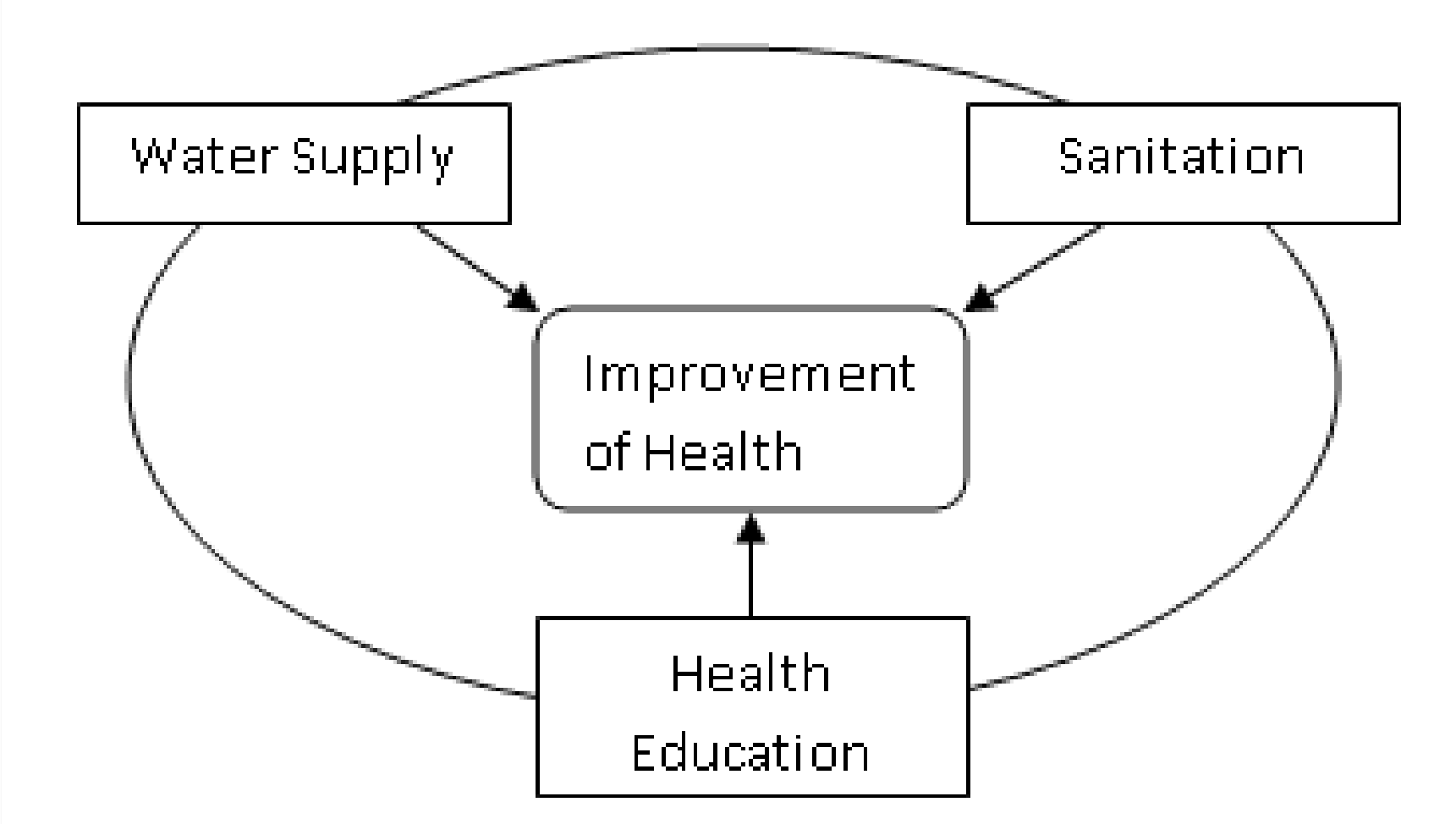


Figure: Interrelationship between water, sanitation and health education

Classification of Waste

Human Wastes or Human Excreta:

- Refers to only human faeces and urine.
- Usually not combined with other liquid or solid wastes.
- Also known as night soil, when collected without dilution in large volumes of water.

Municipal Sewage/ Wastewater:

- Liquid waste conveyed by a sewer.
- May include domestic and industrial discharges as well as storm water, groundwater, infiltration and inflow.

Classification of Waste

Domestic Sewage:

- Liquid wastes, which originate in the sanitary conveniences, e.g., water closets, urinals, bath, sinks etc. of the dwellings, commercial facilities and institutions in a community.

Sullage:

- Liquid discharges from kitchens, wash basins etc. and excludes human excreta.
- Less foul than domestic sewage.
- Can be discharged through open surface drains in unsewered areas.

Classification of Waste

Industrial Wastes:

- Include the liquid discharges from spent water in different industrial processes such as manufacturing and food processing.

Storm Water:

- It is the surface runoff during and immediately after rainfall, which enters sewer through inlets.
- It is not as foul as sanitary or industrial sewages.
- It can be carried through open drains or channels and disposed of in natural rivers or streams without any treatment.

Classification of Waste

Solid Wastes:

- It include all materials which are normally solid and are discarded as useless or unwanted during human activities.

- Domestic solid waste is a composition of organic food wastes, paper and paper products, wood, plastics, leather and rubber, textile products, glass, metals, inert stone and other bulky wastes.

- Solid wastes from factories and industries often consist of packaging, spoiled material and unwanted by-products.