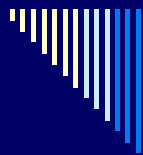


Water utilization and wastewater recycling



Water utilization

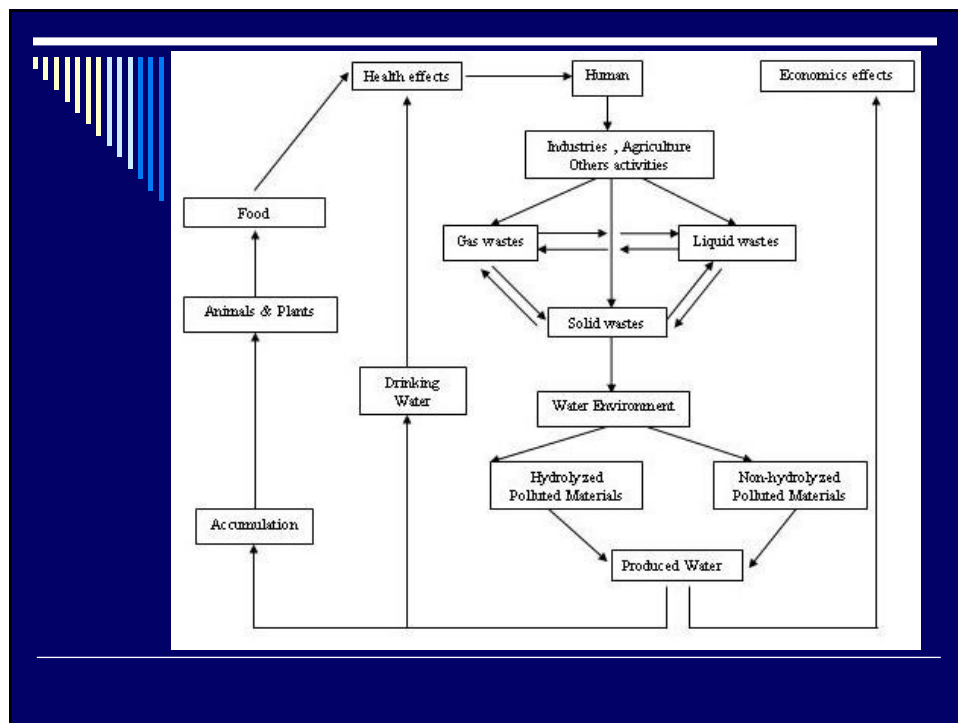
- Water sources.
 - Water pollution sources.
 - Characteristics of food plant wastes.
 - Water treatment.
 - Uses of water in food industry.
-

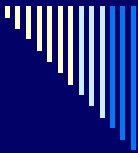
Water sources

- surface water
- Ground water

water pollution sources

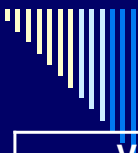
The principle types of pollution originated from decayed vegetation, fertilizers, agriculture chemicals that have leached from the soil, industrial wastes, sewage and animal wastes





Water pollution identification

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD).
- Suspended solids.
- Grease & oil.
- Organisms indicative of fecal pollution



Some Common Diseases Transmitted by water

Viruses	Bacteria	Protozoa
Poliomyelitis	Cholera	Giardiasis
Hepatitis A	Shigellosis	Amebiasis
Reovirus infection	Typhoid fever	Coccidiosis



Water Treatment

1-sedimentation

This frequently used process is both effective and economical for the removal of suspended particles that have a density greater than that of water.

2-filtration

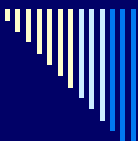
one of the most common and simplest of filters is a bed of sand.

3-Softening

Zeolites may be used in water supplies afflicted with extremely high levels of metallic ions. These zeolite resins exchange sodium ions for calcium and magnesium ions

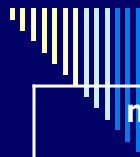
4-Disinfection

Chemical disinfectants are used to kill microorganisms



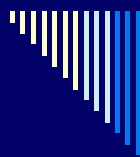
suggested concentrations of chlorine for various purposes

Purpose	Concentration (ppm)
Drinking water	0.2
Process water	0-0.5
Sanitizing	100-250
Fish thawing	5.0-10.0
Cleaning	10-20



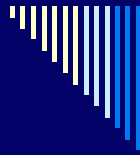
Effective Chlorine levels

microorganism	Concentration (ppm)
Algae	2.0
Bacteria (gram neg.cells)	0.2-5
Spores	150-250
Mold (hyphae)	100
Spores	135-500
viruses	0.2-3.25



Uses of water in food industry

- formulation water
- cleaning
- cooling
- steam & Boilers



wastewater recycling system

The right system for treated oily wastewater are micro filtration and ultra-filtration.

Suitable Application include:

- Rinse or wash down water recycling.
 - Cleaning water or mop water recycling.
 - Cooling tower water recycling.
 - Food process wastewater treatment.
 - General oily wastewater minimization.
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