

Water Resources: The Hydrologic Cycle OR HYDROLOGICAL CYCLE

The history of human civilization reveals that water supply and civilization are almost synonymous. Several cities and civilizations have disappeared due to water shortage, originating from climatic changes. Millions of people all over the world; particularly in the developing countries, are losing their lives every year from water-borne diseases. An understanding of water chemistry is the basis of knowledge of the multi-dimensional aspects of aquatic environmental chemistry, which involves the sources, composition, reactions and transport of water.

About 97% of the Earth's water supply is in the ocean which is unfit for human consumption, and other uses because of its high salt content. Of the remaining 3% 2% is locked in the polar ice caps and only 1% is available as fresh water in rivers, lakes, streams, reservoirs and ground water, which is suitable for human consumption.

Ground water and surface water used by man are of different characteristics. Ground water contains dissolved minerals from the soil layers through which it passes. In the process of seepage through the ground, the water gets depleted of most of the microorganisms originally present in the surface water. Though the salt content may be excessively high on occasions, it is generally superior as a domestic water source. Surface water contains a lot of organic matter and mineral nutrients which feed algae and large bacteria populations.

The mass balance of annual rainfall shows that about 70% is lost by direct evaporation and transpiration by

Kontal.

plants, while the remaining 30% goes into the streamflow. The approximate break-up of this streamflow, as consumed by man, is 8% for irrigation, 2% for domestic use, 4% for industries and 12% for electrical utilities. Irrigation for agricultural purposes and electric power plants are the major consumers of water.

The surface water resource continues to be contaminated with run-off water from agricultural fields, containing pesticides, fertilizers, soil particles, waste chemicals from industries and sewage from cities and rural areas. If the water is to be reused, it must be purified. ~~This will be discussed in~~ and Waste Treatment Management and Recycling.

WHO (World Health Organization) has estimated that water consumption will have to be cut by 50% by 2025 if nations fail to address imbalances in global water supply and demand.

In the perspective of global crisis of fresh water, some European companies have ventured into water business by supplying water to water-thirsty countries across the oceans. Nordic water supply (Norway) has been transporting fresh water (Clean drinking water) in giant floating bags across the oceans. These are sausage-shaped bags, 200m long and containing 35,000 tons of water. The water bags are made of a polyester fabric coated with plastic and are 2.0 mm (0.08 inch) thick.

The company has plans to float super tanker bags (300m long)

Contd.