LINGAYA'S VIDYAPEETH
choose to know

Subject: Environmental Science And Ecology
Topic: Natural Resources
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RESOURCE BASE

- GLOBAL : Total supply of water 1,386,000,000 km3
- 1,338,000,000 km3 in oceans(95%)
- Level of water in the sea has varied over time (during last ice age it was lower by 45ft, last warm spell it was higher by 18ft)
- Remaining 5% is not easily accessible . Only 0.3% of water is suitable for use

SOURCES OF WATER

- RIVERS , LAKES, OTHER WATERBODIES
- GROUND WATER
- ARCTIC ICE AND OTHER INACCESSIBLE SOURCES
- AVAILABILITY OF WATER DEPENDS ON HYDROLOGIC CYCLES

HYDROLOGIC CYCLE

- Physical process of
- (1) Evaporation
- (2) Condensation
- (3) Precipitation
- (4) Infiltration,
- (5) Run off
- (6) Sub surface flow
- Hydrologic cycle involves exchange of heat energy – during evaporation water absorbes energy, during condensation water releases energy
- Approx 505,000 km3 water falls as precipitation , 398,000km3 falls on oceans

Precipitation characteristics

- Canopy interception
- Snow melt
- Run off
- Infiltration
- Sub surface flow
- Evaporation
- Sublimation
- Advection
- Condensation
- Transpiration

Impact of anthropogenic activities on hydrologic pattern

- Agriculture
- Industry
- Alteration in chemical composition of atmosphere
- Construction of dams
- Deforestation and afforestation
- Removal of ground water
- Water absorption
- Urbanisation

Factors affecting water resources

- Climatic factors: Rainfall :intensity,duration,distribution, quantity
- Snow,
- Evapotranspiration

Physiographic factors

- Basic characteristics:
- geomorphic,drainage,catchment,slope, stream intensity
- Physical factors: land use, surface infiltration, soil types etc. Channel characteristics –storage capacity
- Geological factors: lithologic incliding composition, texture etc, structural including faults,
- Hydrologic characteristics –acquifer permeability, porosity,transmissivity, stabilityss

RUN-OFF FUNCTIONS

- Rainfall, Temperature,Absorption
- Rm=Pm-Lm (1)
- Lm=0.481Tm(2)
- Rm=monthly run off (cm)
- Pm=monthly run-off coefficient
- Lm=monthly evaporation losses (cm)
- Tm=mean monthly temperature (c)ss

Water requirement

- Domestic
- Agriculture
- Industrial
- Landscape

- One flow unit appx: 1360 lpcd (FAO)

WATER POLLUTION

- Contamination of water bodies
- Contamination by anthropogenic activity
- Water pollution affects : plants,organisms-individual species as well as biological communitiess
- Disease caused by polluted water: enteric, skin and bone affectations
- Estimated 14000 deaths everyday global

AGENTS OF WATER POLLUTION

- Point sources: single identifiable source e.g effluent discharge pipe
- Non point sources: Run off- agriculture, urban areas , Sheet flow
- Contminants: chemical-toxic, organic, inorganic
- Pathogens-coliform bacteria, virus, worms
- Oxygen depleting substance
- Turbidity: suspended and dissolved solids
- Microscopic pollutants: garbage, plants
- Thermal pollution

TESTING WATER QUALITY

- Sampling
- Physical testing
- Chemical testing
- Biological testing-bio indicators

Water quality standards

- Best use classification : source base
- Parameters as per Water (Prevention and control of pollution) Act

Setting water quality goals

- Water quality monitoring
- Identification of nature and magnitude of pollution
- Source inventory
- Water quality information
- Selection of technology
- Financing water management
- Maintenance of sewage treatment plants
- Pollution from industrial plants

POLLUTION CONTROL

- CONTROL AT Point SOURCES
- REUSE/RECYCLE
- WASTE MINIMISATION
- CLEAN TECHNOLOGY
- WASTE WATER DISCHARGE STANDARDS
- Control POLLUTION FROM NON-POINT SOURCES: agriculture, urban run-off,construction site