MODULE 10 - FRESH WATER ECOLOGY

OBJECTIVES

By the end of the session the students shall be able to:

1. Know about various types of fresh water bodies such as lakes, ponds, rivers, rain puddles and dug wells as well as tube wells.

2. Ponds and lakes having stagnant water are Lentic ecosystems while rivers and streams having running water Lotic ecosystem.

3. Each water body is an ecosystem having its own procedure, consumers and decomposers.

4. Fresh water bodies are of great importance to man because water is a component of life hence they should be protected from pollution.

SUMMARY

This Module deals with different types of water bodies such as rivers, lakes, ponds and their importance in the life of human beings.

Water bodies are actually ecosystem each having its own producers, consumers and decomposers. They are all balances ecosystems but due to industrialization and Urbanization they are gradually shrinking. Industrial effects and human as well as animal etc. is added to water bodies resulting in pollution. It is our responsibility to protect the water bodies.

TRANSCRIPTION

Introduction:

“The earth paints the image of the morning sun,
On the shimmering brook,
Uncontended, it wipes it out
And makes it flow again.”

In nature, the living organisms and their non living environment are inseparably interrelated and interact on each other. This relationship evokes the concept of ecology a term coined by A.G. Tansley in 1935.

An ecosystem may be of

(a) Terrestrial
(b) Marine or,
(c) Fresh water type

Through fresh water resources occupy less than 1% of the total volume of water available. For many reasons they are of great importance to man.
(a) There are different types of fresh water bodies around the world & their distribution is very uneven.
(b) 75% of the available freshwater is in the U.S.A & Canada.
(c) While, in several other continents like Eurasia & Africa only limited fresh water supply is available.
(d) In the gulf countries especially in United Arab Emirates there is an acute water shortage problem.

Types of Fresh water:
The fresh water bodies are of different types they are:
(a) Rivers which are seasonal or perennial water resources flowing in a gradient & usually joining the sea.
(b) Lakes which represent natural accumulation of water.
(c) Rivers on which impoundments are built or man made large water masses called the reservoirs.
(d) A Pond, which is a closed fresh water resource.
It has an inlet & an outlet.
(e) Ground water resources like the dug wells & Tube wells.
(f) Puddles which are temporary accumulations of water & are seasonal in nature.

Importance of fresh:
"Oh ! do give me water
For I am weary & thirsty
Oh! do give me water
For I am exhausted."
Fresh water is a component of life. It is useful to man in several ways. But today even this taken for granted resource is becoming delimiting to man.
Efforts are now on to develop this resource to its fullest potential.
(a) FAO is targeting to make good drinking water available to urban & rural areas of our country.
(b) The government is also aiming at constructing more reservoirs on the large scale & tub wells & dug wells on the small scale to combat against serious water scarcity in drought striken parts of our country.
Water for irrigation has been provided to several dry areas of our country but, many areas in Western & North western India still face irrigation facility shortage & solely depend on rain water.
fresh water resource also provides a potential for aqua cultural operations like, fish culture, crocodile culture etc. which shall not only earn food but also a substantial portion of foreign exchange through exports.

Utility of fresh water:
The use of fresh water resources for recreation is also quite limited in our country substantial amount of Foreign exchange may be earned in this field also.

Tapping of energy from water falling in a gradient yields Hydroelectricity which is presently the cheapest & most substantial amount of electricity production in our country.
The fresh water ecosystem also serves as a media for several water borne diseases causing organisms. The incidence of cholera, diphtheria, Jaundice, Malaria & several skin ailments etc. is high in our country & their control has become major aims of organizations as WHO & UNICEF.
But before putting this ecosystem to our convenient needs we must make ourselves aware of the natural balance existing there.
Fresh water bodies are ecologically divided into two types –
The lotic or running water types
&
The lentic or standing water types.

Structure of the Ecosystem:
The structure of the ecosystem is made up of interactions between the biotic or living component & abiotic or non living component.
The abiotic component consists of factors such as the
(a) Temperature, Diagrammatically represented by a thermocline.
(b) Light, which causes littoral, limnetic & profundal or aphotic types of zonations.
(c) The concentration of respiratory gases in water.
(d) Concentration of biogenic salts e.g. nitrates, phosphates, calcium,
Sulphur etc. in water.
The biotic component which can be classified on the basis of energy flow as-
(a) Producers:- Which are phytoplanktons or algae & diatons & macrophytes like hydrilla & water hydrilla & water hyacinth & waterlily.
(b) Consumers,which are larval forms of arthropods, cladocerans & the rotiferans & molluses.
(c) Docomposers which are the bacteria & fungi populations.
The aquatic biota may also be classified to the basis of life forms present in particular position on or in the water body.
As periphytons, which are organisms which cling to stems of plants or stones submerged in water body.
Planktons which are organisms which move with water current.
Nektons, which are organisms swimming in water.
As newstons which are organisms resting or swimming on the surface.
Ecosystem productivity can be studied with the help of pyramids of biomass, energy number of autotrophs, heterotrophs & saprotrophs.
Such pyramids help to determine whether the particular ecosystem is autotrophic or heterotrophic i.e. producers more than consumers & consumers more than producers respectively.

How to save fresh water:

Today, man is abusing this intricate & unique ecosystem by almost possessing it. Dumping of huge amounts of sewage wastes, industrial effluents, agricultural discharges, wastes from chemical industries, fossil fuels etc. into these resources in a common occurrence.
Due to this indiscriminate use one day we may be left craving for a drop of fresh water.
We have to thus develop our fresh water ecosystems to at least save ourselves from the hazards of water pollution. We have to construct more dams, canals, ponds, dugwells & tube wells & maintain the water quality supplied for domestic needs.
We have to set up centres at greater incidences for testing water quality & BoD of water.
A Vigilance over the water quality maintenance should be carried out by water pollution control boards. Law enforcement which has been done can also save this invaluable resource & the amended act of 1988 for water pollution control servers the purpose quite well.
Let us leave this wonderful gift of nature endowed upon us alone & not hamper the living community thriving there & deliberately limit their existence as well as ours.
With this we bid adieu to the magnificent world of fresh water Ecosystem even as:
“On the dark waters of the lake,
Shines the light of the twilight hour.”

GLOSSARY

Fresh Water: Water without salt.

Ecology: Relationship between organism and environments.

Ecosystem: between the organism & environment

Abiatic: Non Living

Biotic: Living

Lake: A Closed water body laving natural accumulation of water.

Puddle: Seasonal temporary ditch.

Lentic: Having stagnant water

Lotic: Having running water

Scarcity: Acute shorage

Phytoplanketones: Small plants like Algae floating in deep waters.

Zooplantones: Small animals like Cyclops which feed upon Phytoplanktones.

Arthopods: Animals with jointed affendoges

FAQs

Q.1 What is fresh water?
Ans : Water without salts.

Q.2 List any four fresh water bodies:
Ans 1.River 2.Lake 3.Pond 4.Stream

Q.3 What of type of ecosystem is frond in river & steam.
Ans: Lotic ecosystem.

Q.4 What is a lentic ecosystem ?
Ans : Ecosystem for end in stagnant water.

Q.5 What is direction of plan of a river ?
Ans : From mountain to sea.

Q.6 Does any river originate from seas.
Ans : No

Q.7 What is Dam ?
Ans : Man made barrage across a river for irrigations supply of drinking water & generation of hydro electricity.

Q.8 List different sources of drinking water in villages ?
Ans 1.Pond 2 .Dugwell 3. Tube well 4. Hand Pump

Q.9 What is full form of FAO ?
Ans : Food and Agriculture organization

Q.10 List three types of terrestrial ecosystems
1.Forest 2. Grassland 3. Desert

Q.11 Which is the biggest ecosystem of the world
Ans Ocean

Q.12 Which is the most stable ecosystem
Ans : Ocean

Q.13 Which countries are facing the problem of natured fresh water
Ans : Arab Countries

Q.14 List any three water borne diseases
(1) Cholera (2) Dysentery (3) Jaundice

Q.15 What is an Ecosystem ?
Ans : Interaction between the organism and environment

Q.16 List two components of Ecosystem
Ans : 1.Biotic 2.Abiotic

Q.17 Name three abiotic components of pond Ecosystem ?
Ans 1.Sunlight 2.Temperature 3.Minerals and Water

Q.18 Name three biotic components of an ecosystem .
Ans : 1. Producers 2.Consumers 3.Decompases

Q.19 What are produced in a pond ecosystem .
Ans : Phytoplankton like Algae and sub-merged plants like Hydrilla as well as rooted floating plants like water lily.

Q.20 What are consumers of a pond ecosystem.
Ans : Zoo planktons, small fish, Big fish and pelican.

Q.21 What is the cause of the death of organism in lakes and ponds.
Ans : Addition of sewage and industrial wastes by man.

Q.22 Which Govt. Organization looks after the quality of water.
Ans : Pollution control board.

Q.23 What efforts are made by the corporations to increase the level of ground water ?
Ans : Harvesting the of rain water.