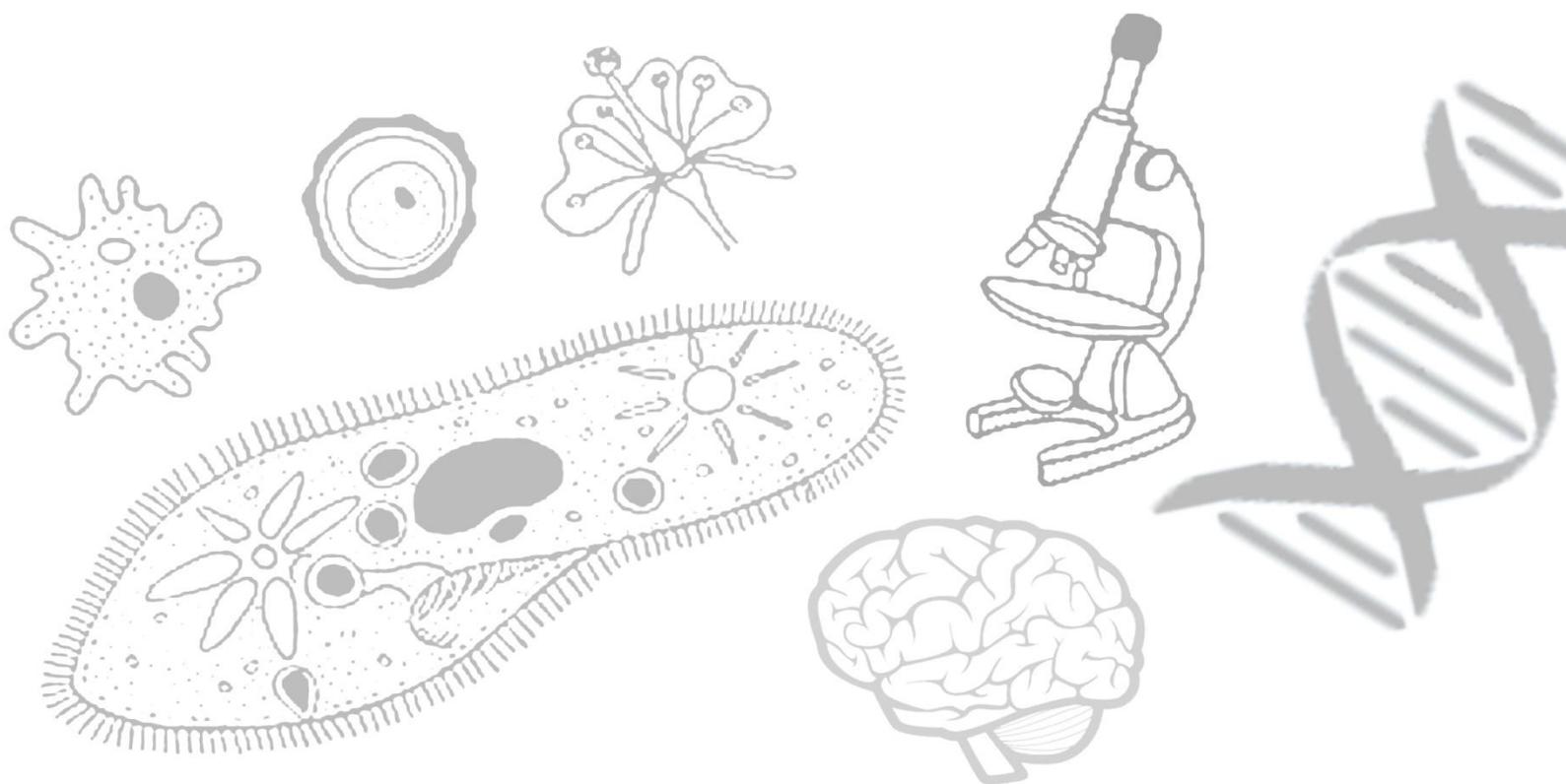


# BIOLOGY



## Management of Natural Resources

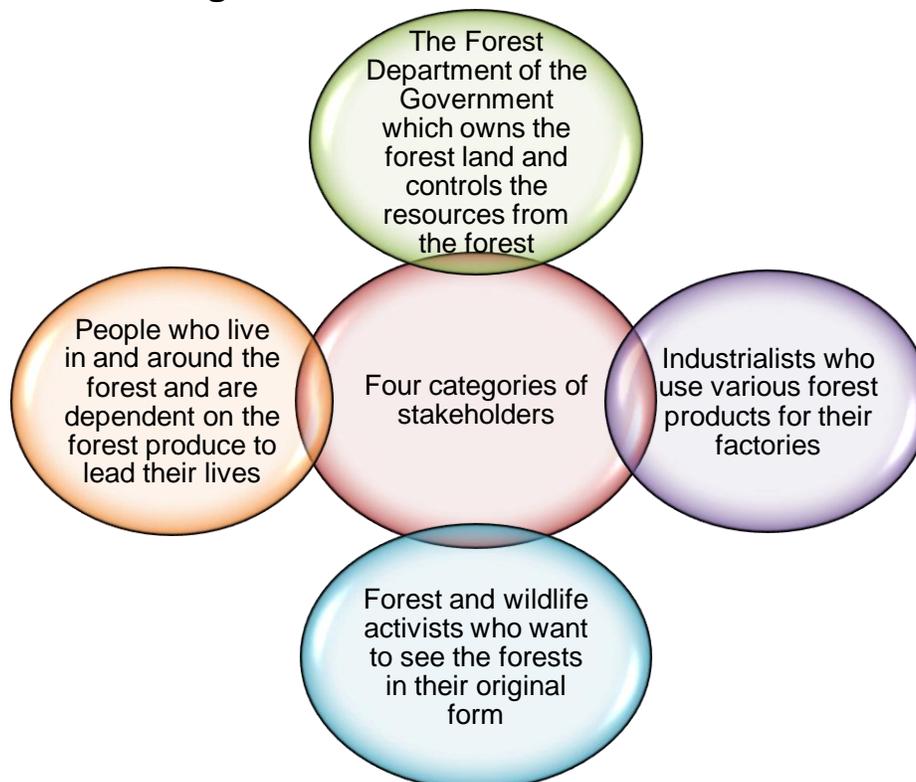
- Any matter or energy, derived from the environment, which can be used by all living organisms, including man, for their welfare constitute our **natural resources**.
- Forests and wildlife, water, coal and petroleum are some of our important natural resources.
- A system of controlling the use of natural resources in such a way so as to avoid their wastage and allow their use in the most judicial way is called **management of natural resources**.
- We need to manage our resources to ensure that they are used judiciously, to prevent their exploitation for short-term gains, and to make equitable distribution of natural resources and deal with environmental problems.
- **Sustainable development** is development which meets the needs of the present generation as well as preserves the resources for future generations.

### Forests and Wildlife

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- **Forests** refer to a large piece of land covered with trees, shrubs and herbs growing naturally and sustaining a variety of life forms.
- Uncultivated plants and non-domesticated animals which live in their natural habitat collectively constitute the **wildlife** of an area.
- Naturally occurring plants and animals constitute the **flora** and **fauna** of the forest.
- The main aim of management of forests and wildlife is to conserve the vast inherited biodiversity, because loss of biodiversity leads to loss of ecological stability of the forest ecosystem.

### Stakeholders in the Management of Forests



## Sustainable Management of Forests

- People's participation in the management of forests can help in increasing the forest produce as well as in their conservation.

### INSTANCES OF PEOPLE'S PARTICIPATION IN THE MANAGEMENT OF FORESTS

#### The Case of Khejri trees

- In 1731, Amrita Devi Bishnoi led a group of 363 people who sacrificed their lives for the protection of Khejri trees in Khejrli village near Jodhpur in Rajasthan.

#### The Chipko Andolan

- The Chipko Andolan also called the 'Hug the trees movement' was organised under the leadership of Sunderlal Bahuguna to stop the destruction of forests.
- The movement began in 1970s in a remote village called Reni in Garhwal in the Himalayas.

#### Revival of Sal forests

- A forest officer, A. K. Banerjee got the villagers involved in protecting 1.272 hectares of badly degraded Sal forests of West Bengal.
- In return, the villagers were given employment in silviculture and harvesting operations.
- They were also given 25% of the final harvest and were allowed to collect fuel wood and fodder on the payment of a nominal fee.

## Conservation of Wildlife

- Large-scale poaching of wild animals disturbs the food chains in which these animals occur. This results in undesirable consequences for the entire ecosystem.

### Measures to be Taken for the Conservation of Wildlife

Breeding of wild animals in captivity and then releasing them into their original natural habitat.

Enacting and enforcing strict laws, action plans and projects started by non-government organisations.

Ban on hunting and killing of endangered animals.

Establishment of national parks, wildlife sanctuaries and biosphere reserves.

Educating the public about the importance of wildlife conservation by observing 'Wildlife Week'.

## Water

- Water is an important constituent of the body. Nearly 75% of our body weight is due to the presence of water.
- Rains, rivers, lakes, ponds, wells, tube wells, dams, oceans and glaciers are the important sources of water.

## Dams

<b>What are dams?</b>	<ul style="list-style-type: none"> <li>• The large reservoir of a dam stores a huge amount of water which is allowed to flow downstream at the desired rate.</li> <li>• The Dharoi dam on the river Sabarmati, the Ukai dam on the River Tapi and the Machhu dam on the river Machhu are some famous dams.</li> </ul>
<b>Uses of dams</b>	<ul style="list-style-type: none"> <li>• They regulate the flow of water.</li> <li>• They also ensure the storage of water for irrigation and for generating electricity.</li> </ul>
<b>Problems faced in the construction of dams</b>	<ul style="list-style-type: none"> <li>• Social problems arise because construction of dams causes the displacement of a large number of tribals and peasants who are then rendered homeless.</li> <li>• Construction of dams leads to several environmental problems such as deforestation and loss of biodiversity leading to ecological imbalance.</li> <li>• Economic problems arise because the construction of dams involves spending of large amounts of public money without generating proportionate funds.</li> </ul>

## Rainwater Harvesting

<b>What is rainwater harvesting?</b>
<ul style="list-style-type: none"> <li>• Rainwater which falls on roofs and terraces of buildings can be collected through pipes and stored in underground tanks or can be allowed to percolate into the soil and used to recharge the groundwater table. This is called water harvesting or rainwater harvesting.</li> </ul>
<b>Advantages of rainwater harvesting</b>
<ul style="list-style-type: none"> <li>• The main aim of rainwater harvesting is to check the runoff water.</li> <li>• It also prevents flooding of living areas and streets in cities.</li> <li>• It can also reduce topsoil loss or soil erosion and improve plant growth.</li> </ul>
<b>Method of rainwater harvesting</b>
<ul style="list-style-type: none"> <li>• In rainwater harvesting, tanks are fitted with motors for lifting water for use.</li> <li>• Water from the open space around buildings can also be recharged into the ground by simple, effective methods.</li> </ul>

### Traditional methods of rainwater harvesting

- In traditional methods of rainwater harvesting, water is not only stored but also used to recharge the groundwater.

Region	Traditional water harvesting structures
Rajasthan	Tanks, Khadins, Nadis
Maharashtra	Tals, Bandharas
Bihar	Ahars, Pynes
Uttar Pradesh and Madhya Pradesh	Bundhis
Himachal Pradesh	Kuhls
Kerala	Surangams
Kandi belt of Jammu region	Ponds
Karnataka	Kattas

### Bawris

- Bawris or step-wells are wells or ponds constructed in the ground. The water in bawris can be reached by descending a set of steps.
- With acute shortage of water, people began to revive these traditional bawris. As a result, despite scanty rains, these places are managing their water needs well.

### Khadin

- Khadin consists of a 100–300-m long embankment called bund made of Earth.
- Rainwater from the catchment area flows down the slope and collects in front of the bund forming a reservoir.
- Sluiceways or pathways through the bund allow excess water to flow through and collect in shallow wells dug behind the bund.
- The water which collects in both the reservoir and the wells seeps into the land and recharges the groundwater. Later, crops can be grown on the water-saturated soil.

### Water harvesting structures on the level terrain

- The water harvesting structures on the level terrain are mostly crescent-shaped, earthen embankments or straight, low concrete and rubble check dams.
- The main purpose of these water harvesting structures is to recharge the groundwater beneath the surface so as to provide moisture for vegetation.
- The water does not evaporate, does not form breeding grounds for mosquitoes and is also protected from human and animal waste.

## Coal and Petroleum

- Fossil fuels such as coal and petroleum are **non-renewable resources** of energy and exist on the Earth in a limited amount.
- On burning in air, coal produces mainly **carbon dioxide** as well as **oxides of nitrogen and sulphur** as products. Increased quantities of carbon dioxide in the atmosphere can cause climatic changes and lead to global warming.
- Burning of coal in the absence of air produces **carbon monoxide** gas. High concentrations of carbon monoxide and oxides of nitrogen and sulphur are poisonous and pollute the environment.
- **Acid rain** is caused because of sulphur particles present in coal.
- Burning of coal also generates waste products which contain **arsenic, mercury, uranium, thorium** and other heavy metals which are harmful to human health and the environment.
- Burning of coal produces dust nuisance and contaminates land and water.

### Alternatives to Reduce the Consumption of Coal and Petroleum

Switch off electrical appliances when not required.

Use energy-efficient electrical appliances like CFL.

Use pressure cookers or solar cookers for cooking food.

Use of biogas as a domestic fuel should be encouraged.

Bicycles should be used instead of cars and scooters to travel short distances.

## Three R's to Save the Environment

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- In order to save our environment and maintain ecological balance in nature, the **3R approach** should be implemented while using resources. The 3R's imply reduce, reuse and recycle.

### Reduce

•We have to reduce the excessive use of resources when not required in order to avoid their wastage.

### Reuse

•We have to use the same resources again and again so that the demand for new resources is reduced and it will also conserve the resources.

### Recycle

•We have to recycle the used resources rather than throwing them away.