

## Management of Natural Resources

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### Check Point 01

**Q. 1. On what basis do we classify a substance as exhaustible or inexhaustible?**

**Answer:** On the basis of renewable or nonrenewable the substances (resources) are classified.

The substances which can be reproduced in nature over a period of time physical, chemical or mechanical changes are renewable. For examples solar energy, wind energy, hydraulic energy, water resources, forests, and wildlife. Whereas, resources which are get exhausted and cannot be renewed are non-renewable resources. Examples are minerals and fossil fuels.

**Q. 2. Why should we use the exhaustible natural resources judiciously?**

**Answer:** Coal and petroleum are exhaustible natural resources and were formed millions of years ago. The stock of these resources are limited and may be exhaust after say 40 -50 years and they cannot be renewed. These resources should be used judiciously so that these can also be used by a future generation. Secondly, excessive use of a natural resource such as coal, petrol causes pollution and global warming. Therefore, we must use coal and petroleum with care.

**Q. 3. Name the 3 Rs' that will help us to conserve natural resources for long-term use.**

**Answer:** The three R's are Reduce, Reuse and Recycle. All these all help to cut down on the amount of waste we throw away. They conserve natural resources, landfill space, and energy.



**Q. 4. The strategy of 3 Rs' has become profound in environment management programme. Give reason.**

**Answer:** Advancement of modern civilization and urbanization had a great impact on our natural resources. Still, we have not realized the value of our natural resources.



Conserving the natural resources such as coal petroleum soil and water is very essential. We can conserve natural resources by adopting the concept of Three R's namely Reduce, Reuse and Recycle. The activity BEST OUT OF WASTE focused on minimizing the usage of available resources and recycling the commonly accessible waste material enabling them to use the resources judiciously and developing the habit of conserving our natural resources.

**Q. 5. The concept of sustainable development has been adopted to limit the damage being incurred to the environment. Justify.**

**Answer:** • The idea of 'sustainable development' became popular with the publication of a paper by the World Commission on Environment and Development, in 1987.

- Sustainable development is defined as development which meets the needs of the present without compromising the ability of future generations to meet their own needs”.
- The sustainable development can be done by reducing pollution by using eco-friendly technology.
- Use of natural resources in such a way to ensure availability for the future generations, social equality in accessing resources.
- Therefore, sustainable development is a need of an hour.

**Q. 6. Suggest any two measures that can be adopted by anyone to conserve our natural resources.**

**Answer:** There are innumerable practices which can be done by anyone to conserve natural resources. Some of the activities are listed below:

- Close water taps when not in use.
- Switch off lights which are not necessary
- Plant more trees.
- Use public transport as far as possible.
- Carry your own bags when heading out for shopping.

## Check Point 02

**Q. 1. Why the name 'biodiversity hotspots' has been given to forests?**

**Answer:** Forest is a house of diverse (different) species of plants, animals and all other sorts of living organisms. A biodiversity hotspot is given to the specific forests consisting



of a richest diversity of species including most rare, vulnerable species of plants and animals and other organisms.

**Q. 2. Why government established Amrita Devi Bishnoi award?**

**Answer:** This award has been instituted by the government of India as to remember the contribution of Amrita Devi and her other conservativators for the Conservation of Khejri tree from being cut.

**Q. 3. Mention the name of movement which arose due to conflict of interest between local people in forests and industrialists?**

**Answer:** The Chipko Movement began from a small village; Reni in Garhwal district. The women of the village hugged the trees to prevent them from cutting by the contractors of an industry.



Chipko Andolan

**Q. 4. Name the forest department officer, who had initiated people's participation in the management of forests?**

**Answer:** The forest officer, A.K. Banerjee involved villagers in the protection of 1,272 hectares of badly degraded sal (*Shorea robusta*) in Arabari forest range of Midnapore district in Bengal.

**Q. 5. In our country, vast tracts of forests are cleared and a single species of plant is cultivated. What does this practice promote?**

**Answer:** Vast tracts of forests have been converted into monoculture (planting single species) on cleared land and plants such as pine, teak or eucalyptus were planted. Such plantations are useful for the industries to access specific products and are an important source of revenue for the Forest Department.

**Q. 6. Write any two measures for the conservation of wildlife.**

**Answer:** To conserve wildlife of the country, **wildlife sanctuaries** and national park are established. Wildlife sanctuaries refer to an area that provides protection and natural living conditions to the wildlife. **National parks** provide protection to the entire plants, animals and, the landscape of that region.

### Check Point 03

**Q. 1. State purposes for constructing rules.**

**Answer:** Over four hundred years ago, in the parts of Himachal Pradesh had developed a local system of canal irrigation called kulhs. The water flowing in the streams was diverted into man-made channels. Canals carried the water to numerous villages down the hillside to irrigate crops.

**Q. 2. For what purpose (any one) were the dams constructed? Do you think dams are serving their purpose completely?**

**Answer:** Large dams can ensure the storage of adequate water not just for irrigation, but also for generating electricity, as discussed in the previous chapter. Canal systems leading from these dams can transfer large amounts of water over great distances. For example, the Indira Gandhi Canal has brought greenery to considerable areas of Rajasthan.

**Q. 3. What is the aim behind Narmada Bachao Andolan?**

**Answer:** The main aim behind the Narmada Bachao Andolan ('Save the Narmada Movement') is to oppose the raising the height of the Sardar Sarovar Dam on the river Narmada. By raising the height a large number of peasants and tribal will be displaced without adequate compensation or rehabilitation,

**Q. 4. Underground water is very essential component of water conservation programme. Mention an advantage of conserving underground water.**

**Answer:** Advantages of conserving ground water: Use of ground water for drinking purpose has various advantages:

Ground water generally does not get polluted, it remains pure and clean. Conserving ground water can help in increasing the water table level in the ground which will also increase the amount of fresh water for human use that is for drinking etc. It could also be used for other industrial uses.

**Q. 5. Despite nature's bounty, why is there a failure in sustaining the underground water sources?**

**Answer:** Despite nature's bounty, we are unable to sustain water availability underground. This happened due to the loss of vegetation cover, diversion for high



water demanding crops, and pollution from urban and industrial wastes. Lack of proper planning and infrastructure to conserve water. Large-scale irrigation methods and dams led to mismanagement of water.

### Check Point 04

**Q. 1. Coal and petroleum are which type of resources? Give reason.**

**Answer:** Coal and petroleum are exhaustible and non-renewable resources because once they are getting exhausted and cannot be renewed by the natural process.

**Q. 2. What is the ultimate source of energy for the fossil fuels?**

**Answer:** Plants trap solar energy during photosynthesis and convert it into food and animals get energy when they eat them. Fossil fuels are made from fossilized plants and animals. Therefore, we can say that the sun is the ultimate source of energy of fossil fuels.

**Q. 3. It is said that the burning of fossil fuel causes pollution. Is it a true or false statement? How?**

**Answer:** It is a true statement. Burning fossil fuels emits a number of harmful gases which are harmful to both the environment and human health. They release carbon dioxide, a greenhouse gas, into the atmosphere. Greenhouse gases trap heat from the sun in the Earth's atmosphere, causing temperatures to rise which results in global warming. Sulfur dioxide (SO<sub>2</sub>) results from the result of burning coal, contribute to acid rain and the formation of harmful particulate matter.

**Q. 4. Which gases are released from the combustion of petroleum and coal?**

**Answer:** When coal and petroleum are burnt completely, carbon dioxide, water, oxides of nitrogen and oxides of sulfur are released but when combustion takes place in the insufficient air (oxygen), then carbon monoxide is formed instead of carbon dioxide.

**Q. 5. Suggest a general practice which will help in the reduction of coal and petroleum use.**

**Answer:** Some simple choices can help in reduction coal and petroleum use:

### Chapter Exercise

**Q. 1. Name the prominent ecologist, who is responsible for Chipko Andolan and the lady behind the success of the movement.**

**Answer:** Sunder Lal Bahuguna was started the Chipko Andolan and Gaura Devi was the lady behind the success of the movement.



- (a) Use of solar energy instead of electricity.
- (b) Use public transport, avoid using personal vehicle
- (C) Using LED bulbs or fluorescent tubes in your homes.

**Q. 2. In which region of India, Bundhis are used for water harvesting?**

**Answer:** In Madhya Pradesh Bundhis are used for water harvesting.

**Q. 3. What is the main purpose of rainwater harvesting?**

**Answer:** Rainwater harvesting is a process of collecting, filtering, storing and using rainwater for irrigation and for various other purposes.

**Q. 4. Name the most common practice of recharging groundwater.**

**Answer:** The crescent-shaped earthen embankments or low, straight concrete-and rubble “check dams” are built across seasonally flooded gullies for the recharging ground water.

**Q. 5. Which country has the world's strictest standards for the control of water and air pollution?**

**Answer:** Iceland has the world's strictest standards for the control of water and air pollution.

**Q. 6. How can we prevent floods?**

**Answer:** Floods can be prevented by protecting wetlands and plant more and more trees strategically. Keeping a close eye on climate change.

Restore rivers to their natural courses and increasing water storage areas.

**Q. 7. Name a clean gaseous fuel other than LPG and natural gas.**

**Answer:** Ethanol is a clean gaseous fuel other than LPG and natural gas.

**Q. 8. Name the only resource which is not obtained from the Earth.**

**Answer:** Sunlight is the only resource which is not obtained from Earth. Sun energy is found in all things, including fossil fuels. Plants depend on the sun to make food, animals eat the plants, and both ended up becoming the key ingredients for fossil fuels. Without the sun, nothing on this planet would exist.



Ethanol, unlike petroleum, produces no net carbon dioxide emissions. That's because ethanol is made from plants that remove carbon dioxide from the air while growing.

**Q. 9. Why is it necessary to conserve our environment?**

**Answer:** Environmental conservation is important for the following reasons:

- For protecting the ozone layer, maintaining animal and human food chains, preserving potable water and making efficient use of non-renewable resources.
- Environmental conservation seeks to prevent dormant damage through measures such as proactive management and ecologically sustainable energy production.

**Q. 10. Classify the following as recyclable and reusable substances. Paper bag, cloth napkin, bottles of pickles, jams, etc., newspapers, metal articles.**

**Answer:** Paper bag, newspaper, cloth napkins, bottles of pickles can be recycled and reused.

**Q. 11. What are the natural resources? Give at least two factors that work against an equitable distribution of these resources.**

**Answer:** Anything used by humans to satisfy their needs and demands which is available in nature is known as natural resources, examples are water, soil plants, sunlight, and wildlife.

Factors working against an equitable distribution of natural resources are

- (a) Excessive use of the resources by the industrialists for short-term gains.
- (b) Access of natural raw materials only to a certain group of influential people to improper management.

**Q. 12. What are the various factors to be considered while we exploit our natural resources?**

**Answer:** While exploiting the natural resources we should consider the following factors:

- (a) The available natural resources must be managed for a long-term so that these will last for the generations to come.
- (b) Management of resources to ensure equitable distribution of resources among all the people.





(c) Sustainable management of the environment is required while we exploit or used these natural resources. For example, mining causes pollution because of a large amount of slag is produced which should be properly disposed of.

**Q. 13. Why do you think there should be an equitable distribution of resources?**

**Answer:** • Available natural resources must be distributed among the people uniformly so that each and every one gets his share of the resource.

- Human greed, corruption, and the lobby of the rich and powerful are the forces working against an equitable distribution of resources.

**Q. 14. What are the ill effects of the interest of the industries in the forest as a source of raw materials?**

**Answer:** • Industries related to timber, paper, lac and sports equipment consider the forest as merely a source of raw material for their factories.

- People who run these industries are influential people and obtain raw materials of the forest very cheap.
- These industries are not interested in the sustainability of the forest in one particular area.
- For example, after cutting down all the teak trees in one area, they move to farther away.
- They do not bother about sustainable development.

**Q. 15. Forest and wildlife maintain the natural balance of our environment. Elaborate.**

**Answer:** • Forest is a natural habitat for a large number of species of plants (flora) and animals (fauna).

- The biodiversity we have inherited should be conserved and preserved.
- Loss of diversity may lead to loss of ecological stability.
- Plants are producers, they produce food and release oxygen. The food is consumed by consumers (wildlife).
- Wildlife provides stability to different natural processes of nature and decomposers decomposes (bacteria and fungi) the dead materials into nutrients.
- Nutrients cycled back to the nutrient pool.





- Therefore, we should conserve forest and wildlife to maintain the natural balance of our environment.

**Q. 16. Why is silviculture considered an advantageous practice in the management of forest resource?**

**Answer:** ● Silviculture is the branch of forestry that deals with establishing, caring for and reproduction of trees for a variety of forest uses including wildlife habitat, timber production, and outdoor recreation.

- Silviculture requires a knowledge of how various tree species grow under particular conditions of soil, climate, and spacing.
- The focus of silviculture is to generate income from the forest by increasing recognition of forestland's use for leisure and recreation.

**Q. 17. Write a short note on "Hug the Trees" movement.**

**Answer:** ● Hug the tree was a movement aimed to protect the trees and forests from being destroyed.

- This movement is also called as Chipko Andolan and started by Sunder Lal Bahuguna.
- It was started in the 1970's to inspire eco-groups by helping to slow down the rapid deforestation, expose vested interests, increase ecological awareness, and demonstrate the viability of people power.
- The villagers used to hug the trees and protect them from the contractors from cutting them.

**Q. 18. Why is there a scarcity of water in our country?**

**Answer:** The water scarcity in India is mostly man-made. Some of the major reasons for water scarcity are:

- (a) Excessive population growth and mismanagement of water resources. Inefficient use of water for agriculture.
- (b) Traditional techniques of irrigation cause maximum water loss due to evaporation, drainage, percolation, water conveyance, and excess use of groundwater.
- (c) Reduction in traditional water recharging areas. Rapid construction is ignoring traditional water bodies that have also acted as ground water recharging mechanism. We need to urgently revive traditional aquifers while implementing new ones.



(d) Lack of efficient water management and distribution of water between urban consumers, the agriculture sector, and industry

**Q. 19. How is rainwater harvesting done from open spaces around the buildings in city areas?**

**Answer:** • Broadly rainwater can be harvested for two purposes, storing rainwater for ready use in containers above or below ground and charging into the soil for withdrawal later.

- This is called ground water recharging.
- Landscapes, open fields, parks, roads and pavements and other open areas can be effectively used to harvest the runoff.
- The main advantage in using the ground as collecting surface is that water can be collected from a larger area.
- This is particularly advantageous in areas of low rainfall.

**Q. 20. Describe briefly the Khadin' system of rainwater harvesting practiced in Rajasthan.**

**Answer:** • The khadin system is based on the principle of harvesting rainwater on farmland and subsequent use of this water-saturated land for crop production.

- A khadin is also called a dhora is traditional construction designed to harvest surface runoff water for agriculture.
- Khadin is first designed by the Paliwal Brahmins of Jaisalmer, western Rajasthan in the 15th century.
- Its main feature is a very long (100-300 m) earthen embankment built across the lower hill slopes lying below gravelly uplands.

**Q. 21. Excessive irrigation and the chemical application have impacted agriculture and environment in what ways?**

**Answer:** (a) Excess of water in soil results in water logging condition which adversely affects soil aeration. It inhibits the process of germination of seeds. Roots do not grow properly in a standing water field and destroy standing crops

(b) Chemicals are applied to the crops in the form of fertilizers and pesticides. Excessive use pollutes water causing damage to aquatic life.



**Q. 22. Why is the dependence of man on nature greater than that of any other organisms?**

**Answer:** • Humans use nature for various purposes in addition to satisfying their basic food and shelter needs.

- The development of man and his relentless pursuit of progress, comfort, luxury, and security.
- To achieve this human overexploit the existing natural resources without replenishing them.
- Whereas, other organisms use nature only to satisfy their basic needs for food and shelter.
- They do not store anything for future use.

**Q. 23. List four changes you would incorporate in your lifestyle in a move towards sustainable use of available resources.**

**Answer:** Four changes that can be incorporated in my life style as a move towards sustainable use of available resources are:

1. I shall reduce wastage of electricity by switching off unnecessary lights and fans. I will use solar lamps instead of electric bulbs and will use CFL instead of traditional bulbs.
2. I shall reduce the use of petrol by pooling my car or by using public transport where it is necessary.
3. I shall segregate non-biodegradable waste consisting of plastic, glass, and metal from other waste and send it for recycling.
4. Whenever I will go shopping I will carry my own jute bag.
5. I shall pass on my books and notes to my junior instead of disposing of as waste paper

**Q. 24. How local people can be used for successful forest management?**

**Answer:** • The people who live in villages around the forests, take firewood from the trees.

- They usually lop the branches of the trees & pluck their leaves but don't cut down the whole trees.



- On the whole, people living near the forests usually use the resources of the forests in a way that much damage is not done to the environment.
- The people living near the forests had developed practices to ensure that the forest resources were used in a sustainable manner.
- There are many examples which suggest that the involvement of local communities is necessary for any conservation effort.
- The Bishnoi community of Rajasthan is one such example: Amrita Devi Bishnoi is still remembered with reverence for the way she fought for protecting the khejri trees in Khejrali village. She; along with 363 other people; sacrificed her life for the protection of khejri trees in 1731.
- The 'Amrita Devi Bishnoi National Award for Wildlife Conservation' has been named in her honour.

**Q. 25. What is water harvesting? Write any two advantages of it.**

**Answer:** Water harvesting is a method of holding rainwater on the surface of the earth, to make it collected under the ground, so as to renew groundwater.

The two advantages of water harvesting:

- (a) Giving people control over their local water resources to ensure that overexploitation of water resources will be reduced.
- (b) The water stored in the ground provides moisture for the growth of the vegetation over a wide area and is protected from human contamination.

**Q. 26. Construction of a dam on a river often results in the reduction of fish catch. Why is it so?**

**Answer:** ● Dams are been constructed on river which holds large amount of water.

- It makes water stagnant but it provides suitable living conditions for lots of aquatic organisms which habitat in dam water.
- Since fishes breed in clean and running water it cannot sustain and breed in stagnant river water in a dam.
- Therefore, as they can't sustain in the dam their breed decrease and some eventually die.
- Hence, we can say that construction of dams on the river often results in a reduction of fish catch.

**Q. 27. State the advantages of constructing dams across the rivers.**

**Answer:** • Dams are built to control water through the placement of a blockage of earth, rock, and concrete across a stream or river.

- Dams are usually constructed to store water in a reservoir, which is then used for a variety of applications such as irrigation and municipal water supplies.
- Reservoir water can also be directed to flow through hydraulic turbines, producing electric power for use in homes and industries.
- Hydroelectric power is considered a renewable source of energy because the reservoir water that is used to generate electricity is continuously replenished.
- A dam using locks and canals, such as the series of locks on the canal, water flows through a human-made water route that must overcome elevation differences.

**Q. 28. Why is water considered as the most valuable natural resource?**

**Answer:** • Water is one of the most important substances on earth.

- All plants and animals must have water to survive.
- If there was no water there would be no life on earth. Apart from drinking it to survive, people have many other uses for water.
- Fresh water is used by all living beings except marine organisms. They use sea water.
- Fresh can be obtained from three natural sources.
- Natural sources of fresh water are rain, surface water, and groundwater.
- The body of living beings is composed of water.
- Water is required for all the chemical reactions such as digestion, excretion in the body (metabolism), similarly plants need water for growth, photosynthesis, respiration and other metabolic reactions require water.
- Therefore, water is a valuable resource.

**Q. 29. What is petroleum? Which other substances are derived from crude petroleum?**

**Answer:** • Petroleum also is known as crude oil or simply oil is a fossil fuel.

- Petroleum is mainly composed of hydrocarbons.
- It was formed by the degradation of bio-mass millions of years ago and it is a non-renewable resource which can be exhausted.
- Other substances derived from crude petroleum are:

Gasoline 46%

Diesel 20%

Kerosene 8%

Propane 7%

Petrochemical 2%

Petroleum coke 2%

**Q. 30. Write a few steps to reduce consumption of coal and petroleum.**

**Answer:** Coal is used to produce electricity. So, if we can save electricity, then the coal consumption will be automatically reduced. Similarly, the petroleum products such as kerosene and LPG are used for cooking food, and petrol and diesel are used as fuel in motor vehicles, so to reduce the consumption of petroleum we should practice some smart ways to reduce it.

Some of the steps which can be taken to conserve energy resources (like coal and petroleum) are as follows:

- (a) Switch off the electrical appliances when they are not in use. Use energy efficient electrical appliances such as Compact Fluorescent Lamps (CFL) and fluorescent tube-lights to save electricity
- (b) Use stairs instead of lift to go up at least t 3 floors. This will save electricity.
- (c) Pressure cookers should be used for cooking food to save fuels.
- (d) Solar cookers should be used to cook food whenever possible.
- (e) Use public transport as far as possible to reduce be improved so that people do not commute in their personal vehicles. This will save a lot of petrol and diesel.

**Q. 31. In what ways damages are caused to the environment?**

**Answer:** • Damage to the environment is one of the biggest threats that are being looked at in the world today.

- Environmental degradation can happen in a number of ways. When resources are exhausted, the environment is considered to be damaged or harmed.

The following factors damage the environment:

(a) Overpopulation: Rapid population growth demands more food, clothes, and shelter. This puts pressure on natural resources which damages our environment.

(b) Pollution: Air, water, land or noise pollution is harmful to the environment. Air pollution pollutes the air that we breathe which causes health issues. Water pollution degrades the quality of water that we use for drinking and other purposes.

(c) Deforestation: Rapid growth in population and industries are two of the major causes of deforestation. Deforestation contributes to global warming as decreased forest size puts carbon back into the environment.

**Q. 32. Forest resources ought to be used in a manner that is both environmentally and developmentally sound. Explain this briefly.**

**Answer:** • We need to accept that human interference has been very much a part of the forest landscape.

- What has to be managed in nature and how much to be the interference with nature.
- Forest resources need to be used in a manner that the environment is preserved, the benefits of the controlled exploitation go to the local people.
- A process needs to be developed in which decentralized economic growth and ecological conservation go hand in hand.
- The type of economic and social development we want will ultimately determine whether the environment will be conserved or further destroyed.
- The environment must not be regarded as a pristine collection of plants and animals. It is a vast and complex entity that offers a range of natural resources for our use.
- We need to use these resources with care for our economic growth as well as social growth.

**Q. 33. Quote some instances where human intervention saved the forest from destruction.**





**Answer:** ● The Chipko Andolan (Hug the Trees Movement) was the result of a grass root level effort to end the separation of people from their forests.

- The movement originated from an incident in a remote village called Reni in Garhwal during the early 1970s.
- There was a dispute between the local villagers and a contractor who had been allowed to cut trees in a forest close to the village.
- On a particular day, the contractor's workers appeared in the forest to cut the trees, seeing this the women of the village reached the forest quickly and clasped the tree trunks thus, preventing the workers from felling the trees.
- The protest spread in that area, as a result, the contractor had to withdraw its plan to cut trees.

**Q. 34. Explain "industrialization is one of the main causes of deterioration of the environment."**

**Answer:** ● To meet the needs of a growing population, new industries are being setup. To set up industry lots of natural resources are depleted.

- Emissions from the factory lead to air pollution, water pollution, and soil pollution.
- It causes acid rain that leads to the degradation of land quality. Global warming, climatic changes are the major consequences of industrialization.
- Industrial wastes including toxins enter in the food chain causes a number of undesirable effects to living beings and animals.
- Industrial effluent damages the natural biological purification mechanism of sewage treatment causing several soils and water-borne diseases.
- Radioactive industrial pollutant cause undesirable disease when food containing radio-nuclides is taken by man.

**Q. 35. How can an individual contribute or make a difference to the management of (i) Forest? (ii) Fossil fuels?**

**Answer:** An individual contributes to the management of:

**(i) Forest and wildlife:**

(a) We should protest against the mass cutting of trees (deforestation). Each one of us can plant as many plants can and motivate others to do that.

- (b) We should protest against the poaching of wild animals.
- (c) We can prevent hunting of wildlife by reporting on time to authorities concerned.
- (d) We should stop the acquisition of forest land for our use.

**(ii) Fossil fuels:**

- (a) Coal and petroleum are fossil fuels.
- (b) Coal is used to generate electricity. Therefore, to save coal we should save electricity by minimizing its wastage.
- (c) To save petrol, we should take a public transport or practice carpooling to avoid excessive use of petroleum.
- (d) We should use alternative sources of energy such as hydro-energy and solar energy instead of depending largely on coal and petroleum.

**Q. 36. Why are environmentalists insisting upon sustainable natural resource management? Give reasons.**

**Answer:** • Sustainable development refers to a balance between natural resources, ecosystems, and the requirement of natural resources, for the development and growth of humans living.

- Sustainable development also includes judicious use of our natural resources so that they are of use to the future generations.

- Environmentalists insisting on sustainable natural resource management because of following reasons:

- (a) Most of the natural resources are limited. Human population is increasing at a tremendous rate, use of natural resources is increasing at an exponential rate.
  - (b) Need to conserve resources for future generations.
  - (c) Equal distribution of resources for equal benefit.
  - (d) Need to reduce the damage caused to the environment because of the over-exploitation and utilization of resources.
- Thus, a proper and planned usage of natural resources is essential for an overall balance with respect to the environment and also prevention of over usage of natural resources.



- Sustainable development helps in maintaining the quality of the environment by restoring the natural and economic resources of different habitats.

**Q. 37. CFL is costly as compared to the incandescent electric bulb. Even, then it is advised that incandescent bulbs should be replaced by CFLs. Why so?**

**Answer:** A compact fluorescent light (CFL) is just like the standard florescent lights that are common in use. The CFL has a smaller tube that's manufactured in a swirl shape so it fits the basic form of an incandescent bulb. The CFL work by exciting gases with electricity, due to this feature, in CFL little heat is generated, most of the electricity used goes directly into providing light. It's less wasteful, so you end up spending less on your regular electric bill by making your home more energy efficient, and the bulbs last much longer.

Advantages of CFLs:

- (a) High Efficiency: CFLs use 20% to 33% less electricity than incandescent bulbs.
- (b) Long Life: With no filament to burn out, florescent lights tend to last 8 to 15 times longer than incandescent bulbs.
- (c) Cost effective: the Up-front price of CFL is higher, but by using less electricity and helping you avoid changing bulbs, you'll end up spending less in the long run.
- (d) Safety: CFLs are even safer than incandescent bulbs since lower temperature means the risk of home fire is less.

**Q. 38. Give reasons for switching over from fossil fuels to other sources of energy.**

**Answer:** • Sun, wind, and water are alternate sources of energy.

- Energy from these sources is non-polluting, renewable and efficient.
- To produce these energies all you need is sunlight, running water and wind.
- Not only does the use of renewable energy sources help reduce global carbon dioxide emissions, but they also add some much-needed flexibility to the energy resource mix by decreasing our dependence on fossil fuels which are limited.
- These renewable energy sources create their own energy.
- The object is to capture and harness their mechanical power and convert it into electricity in the most effective and productive manner possible.



- There's more than enough renewable energy sources to supply all of the world's energy needs forever; however, the challenge is to develop the capability to effectively and economically capture, store and use the energy when needed.

**Q. 39.A. Parineeta and Vivek were commenting on the increase in power rates by the Electricity Board. Parineeta said, "the Electricity Board was raising the tariffs almost every six months. Why is this happening?" Vivek said, "the consumption of power is increasing and its production is becoming costlier because of the increase in the price of fuels. We must do something to check its consumption."**

**Suggest some ways to limit the consumption of power.**

**Answer:** Here are some ways to limit the consumption of power:

- (a) Make a habit of turning off all lights and electronics when not in use.
- (b) Replace your incandescent light bulbs with LED bulbs. LED light bulbs are affordable and easy to find at your local store. These light bulbs use up to 75% less energy than incandescent light bulbs
- (c) Turn off your computer and other electronic devices when they are not in use.
- (d) Recycle recyclable materials such as paper, plastic, glass, and other items can reduce your energy consumption significantly.
- (e) Use solar energy, wind energy or hydroelectric energy to reduce power consumption.

**Q. 39.B. Parineeta and Vivek were commenting on the increase in power rates by the Electricity Board. Parineeta said, "the Electricity Board was raising the tariffs almost every six months. Why is this happening?" Vivek said, "the consumption of power is increasing and its production is becoming costlier because of the increase in the price of fuels. We must do something to check its consumption."**

**What will happen, if we do not adhere to controlled use of power?**

**Answer:** If we do not adhere to controlled use to power, there will be continued loss of natural resources such as coal and water.

Let's try to understand:

- Coal is used to generate electricity in power plants. Coal plants are ineffective as only 35 percent of coal's energy is made into electricity in coal-based power plants. The rest is lost as heat.



- Coal burning in power plants uses huge amounts of water to create steam for turning its turbines.
- Burning coal causes smog, acid rain, global warming, and air toxics. All these pollute the air.

**Q. 40.A. Meera and Radhika were on a trip to Mussoorie. They set out on a short trekking on the hills. They were closely watching the flora and fauna in the area. They felt that the area has sufficient biodiversity. This was possible because the forests had remained safe.**

**There was no visible sign of cutting of trees. Meera said with pride to Radhika, "do you know women have played a prominent role in the protection of forests? Without their brave acts, the situation would have been different and miserable."**

**Name two incidents from history when women environmentalists saved the trees from falling by greedy and powerful people.**

**Answer: (a) Bishnoi movement:**

Amrita Devi, a female villager could not bear the destruction of both her faith and the village's sacred trees. She hugged the trees and encouraged others to do the same. 363 Bishnoi villagers were killed in this movement. The Bishnoi tree martyrs were influenced by the teachings of Guru Maharaj Jambaji, who founded the Bishnoi faith in 1485 and set forth principles forbidding harm to trees and animals.

**(b) Chipko movement:**

Gaura Devi, Sudesh Devi Bacchi device of Advani village of Tehri-Garhwal tied the sacred thread around trunks of trees and they hugged the trees. This movement was called 'Chipko Movement' or 'hug the tree movement'. The main demand of the people in these protests was that the benefits of the forest should go to local people.

**Q. 40.B. Meera and Radhika were on a trip to Mussoorie. They set out on a short trekking on the hills. They were closely watching the flora and fauna in the area. They felt that the area has sufficient biodiversity. This was possible because the forests had remained safe.**

**There was no visible sign of cutting of trees. Meera said with pride to Radhika, "do you know women have played a prominent role in the protection of forests? Without their brave acts, the situation would have been different and miserable."**

**What is meant by biodiversity?**

**Answer:** The variety of life exists on Earth, in all its forms and all its interactions. The existence of variety of life is called Biodiversity. The term was coined in 1985. It is the most complex feature of our Earth and it is the most vital. "Without biodiversity, there is no future for humanity. But the loss of biodiversity creating a huge problem to mankind and other life.

## Challengers

**Q. 1. Which of the following statements (s) is/are correct about the renewable natural resource?**

- A. It gets exhausted soon
- B. It requires millions of years to replenish
- C. It reappears at the rate it is used
- D. It cannot be replenished within a short period

**Answer:** A natural resource which can be used repeatedly and is replaced naturally is called a renewable resource. For examples air, water, solar energy, and biomass.

**Q. 2. Which of the following statements about the construction of a dam are incorrect?**

- A. It provides an eco-Friendly environment
- B. It is used to generate electricity
- C. It displaces the largely poor tribals that do not get any benefit
- D. It prevents the occurrence of floods in the river

**Answer:** The poor tribals who have been displaced by various development projects do not get any benefits from the projects. They are and are isolated from their lands and forests without adequate compensation. For example, the oustees of the Tawa Dam built in the 1970s are still fighting for the benefits they were promised.

**Q. 3. 'Narmada Bacho Andolan' has been organized under the leadership of**

- A. Ravi Shankar Maharaj
- B. Medha Patekar
- C. Amrita Devi Bishnoi
- D. Baba Ram Dev

**Answer:** Medha Patkar initiated the Narmada Bachao Andolan. This Andolan (movement) has been in operation for the last 32 years. The Narmada Bachao Andolan (movement) fights for the rights of people, affected by the Sardar Sarovar Dam project, which aims at building dams across the Narmada River.

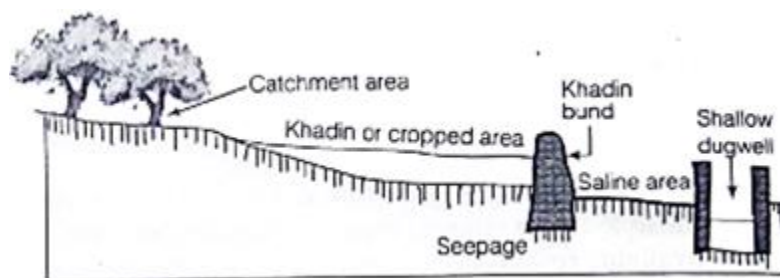
**Q. 4. Which of the following causes an imbalance in the environment?**



- A. The excess growing of green plants
- B. Using more renewable resources
- C. Biodiversity
- D. Increasing human population

**Answer:** Human population grows at an exponential rate (example 2,4,6,8 and so on) whereas, resources grow at an arithmetic rate (example 1,2,3,4 and so on). From this, it is evident that resources do not meet the demand of a growing population. Thus, it causes an imbalance in the environment.

**Q. 5. Consider the following system of water harvesting**



**Which of the following systems is depicted by the given figure?**

- A. Kulh system
- B. Khadin system
- C. Tals
- D. Both (b) and (c)

**Answer:** Khadin system is the ancient water harvesting in Rajasthan. These water storage structures still in use today. These harvesting techniques are highly locale specific and the benefits are also localized. Giving people control over their local water resources ensures that mismanagement and over-exploitation of these resources are reduced or removed.

**Q. 6. Which of the following movements means 'Hug the trees movement'?**

- A. Narmada Bachao Andolan
- B. Chipko Andolan
- C. Tehri Andolan
- D. Biodiversity movement

**Answer:** The Chipko movement was a non-violent agitation aimed at protection and conservation of trees. This movement (Andolan) is best remembered for a group of women gathered around the trees for protecting them against cutting. The movement also brought about a change in attitude regarding their own status in society. The uprising against the felling of trees.



**Q. 7. Complete the following by choosing the correct option:**

**In 1972, the West Bengal Forest Department recognized its failures in reviving the degraded \_\_\_\_\_ forests in the south western districts of the state.**

- A. Teak**
- B. Bamboo**
- C. Sal**
- D. Rosewood**

**Answer:** Traditional methods of surveillance and policing by forest department had led to the destruction of Sal forest in the district of Midnapore in West Bengal. Later villagers were involved in the protection of 1,272 hectares of badly degraded Sal forest. In return for help in protection, villagers were given employment in developing forest.

