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Sustainable Management of Natural Resources



This is a gas turbine plant in the city of Macaé (Rio de Janeiro). It is built to do rainwater harvesting. The plant uses natural water by withdrawing from the Macaé river and rain to provide domestic supply for cities, and industrial supply for agriculture.

Topic Notes

- *Ways to Manage Our Resources*
- *Need to Manage Our Resources*
- *Forests and Wildlife*
- *Water for All*
- *Coal and Petroleum*
- *An Overview of Natural Resources Management*

Explanation: A wide variety of materials are used in the construction of roads which are soil (naturally occurring or processed), aggregates (fine aggregates or coarse aggregates obtained from rocks), binders like lime, bituminous materials, and cement, and miscellaneous materials used as admixtures for improved performance of roads under heavy loads and traffic. Soil constitutes the primary material for the foundation, subgrade, or even the pavement (for low-cost roads with low traffic in rural areas)

(B) (a) Coal

Explanation: Building material is any material used for construction purpose such as materials for house building. Wood, cement, aggregates, metals, bricks, concrete, clay are the most common types of building material used in construction.

(C) Cement is manufactured by heating a precise mixture of finely ground limestone, clay and

1450°C.

(D) (c) (A) is true, but (R) is false.

Explanation: Road and building construction causes lot of environmental pollution as they use cement and other petroleum based products which emit large amount of carbon dioxide in the atmosphere. Large part of the emissions worldwide come from the most ubiquitous part of human environment - roads. Cement, used in road construction, contributes 1 ton of CO₂ per 1 ton of cement produced. Road Industry is increasingly under pressure to reduce carbon footprint. At the same time, efficiency of industrial processes is at its highest. Reductions of CO₂ emissions must come from new techniques of asphalt production, often using waste products as alternative input materials. Therefore, in order to save our environment, use of cement and petroleum based materials for road construction should be reduced.

TOPIC 2

NEED TO MANAGE OUR RESOURCES

We need to manage our resources because the resources of the earth are not unlimited and with the human population increasing at a tremendous rate due to improvement in healthcare. If the natural resources are managed properly, these will last for the generations to come and will not merely be exploited to the hilt for short term gains.

The proper management of natural resources ensures equitable distribution of resources so that all, and not just a handful of rich and powerful people, benefit from the development of these resources.

The proper management will take into consideration the damage caused to the environment while these resources are either extracted or used. For example, mining causes pollution as large amount of slag is discarded for every tonne of metal extracted.

Example 2. What would be the advantages of exploiting resources with short-term aims? How would these advantages differ from the advantages of using a long-term perspective in managing our resources? [NCERT]

Ans. If resources are exploited with short-term aims, it will benefit the present generation and they will be able to utilize the resources for meeting their energy and growth requirements.

However, if long term perspectives are used in managing our resources, it will benefit the future generations also apart from meeting the requirements of the present generation.

This requires sustainable management of resources and using the resources judiciously by developing technologies for efficient utilization of these resources and avoiding any wastage.

Example 3. Why do you think there should be equitable distribution of resources? What forces would be working against an equitable distribution of our resources? [NCERT]

Ans. Equitable distribution of resources is necessary so that people belonging to all classes have access to these resources and are benefitted by utilizing these resources. Equitable distribution of resources will restrict the exploitation, misuse and wastage of these resources by the rich who have access to these resources.

The forces working against an equitable distribution of our resources are:

- (1) Access to resources by the rich and powerful
- (2) Improper management of resources
- (3) Excessive exploitation of resources

FORESTS AND WILDLIFE

Forests are 'biodiversity hot spots'. One measure of biodiversity of an area is the number of species found there. One of the main aims of conservation is to try and preserve the biodiversity we have inherited as a loss of diversity may lead to a loss of ecological stability.

Stakeholders

When we consider the conservation of forests, we need to look at the stakeholders who are:

- (1) The people who live in or around forests are dependent on forest produce for various aspects of their life.
- (2) The Forest Department of the Government which owns the land and controls the resources from forests.
- (3) The industrialists—from those who use 'tendu' leaves to make bidis to the ones with paper mills—who use various forest produce and consider the forest as a source of raw materials for their factories.
- (4) The wild life and nature enthusiasts who want to conserve nature in its pristine form.

Use of Forest Resources

When the Forest Department in independent India took over from the British, local knowledge and local needs continued to be ignored in the management practices. Thus vast tracts of forests have been converted to monocultures of pine, teak or eucalyptus. Such plantations are useful for the industries to access specific products and are an important source of revenue for the Forest Department.

The case of Khejri Trees: In 1731, Amrita Devi Bishnoi led a group of 363 persons who sacrificed their lives along with her for the protection of khejri trees in khejrli village near Jodhpur. The Government has recently instituted an 'Amrita Devi Bishnoi National Award for Wildlife Conservation' in the memory of Amrita Devi Bishnoi.

The Chipko Andolan: The Chipko Andolan ('Hug the Trees Movement') was the result of a grassroot level effort to end the alienation of people from their forests. The movement originated from an incident in a remote village called Reni in Garhwal, high-up in the Himalayas during the early 1970s. The Chipko movement quickly spread across communities and media, and forced the government, to whom the forest belongs, to rethink their priorities in the use of forest produce.

Prejudice against the traditional use of forest areas:

The Great Himalayan National Park contains, within its reserved area, alpine meadows which were grazed by sheep in summer. Nomadic shepherds drove their flock up from the valleys every summer. When this national park was formed, this practice was put to an end. Now it is seen that without the regular grazing by sheep the grass first grows very tall, and then falls over preventing fresh growth.

Management of protected areas, by keeping the local people out, by using force cannot possibly be successful in the long run.

Reasons for Damage Caused to Forests

- (1) The damage caused to forests cannot be attributed to only the local people.
- (2) One cannot turn a blind eye to the deforestation caused by industrial needs or development projects like building roads or dams.
- (3) The damage caused in these reserves by tourists or the arrangements made for their convenience is also to be considered.
- (4) We need to accept that human intervention has been very much a part of the forest landscape.

Steps Needed to Preserve our Forests

- (1) What has to be managed in the nature and extent of this intervention.
- (2) Forest resources ought to be used in a manner that is both environmentally and developmentally sound—in other words, while the environment is preserved, the benefits of the controlled exploitation go to the local people, a process in which decentralised economic growth and ecological conservation go hand in hand.
- (3) The kind of economic and social development we want will ultimately determine whether the environment will be conserved or further destroyed.
- (4) 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.
- (5) We need to use these resources with due caution for our economic and social growth, and to meet our material aspirations.

Sustainable Management

The destruction of forests affected not just the availability of forest products, but also the quality of soil and the sources of water. Participation of the local people can indeed lead to the efficient management of forests.

in the Management of Forests

In 1972, the West Bengal Forest Department recognised its failures in reviving the degraded sal forests in the southwestern districts of the state. The Department changed its strategy, making a beginning in the Arabari forest range of Midnapore district. At the instance of a far-seeing forest officer, A.K. Banerjee, 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 both silviculture and harvesting operations, 25 per cent of the final harvest, and allowed fuelwood and fodder collection on payment of a nominal fee. Soon, these forests of Arabari underwent a remarkable recovery – by 1983, a previously worthless forest was valued Rs 12.5 crores.

Example 4. We saw in this chapter that there are four main stakeholders when it comes to forests

authority to decide the management of forest produce? Why do you think so? [NCERT]

Ans. There are four stakeholders when it comes to forests and wildlife: the people who live in or around forests are dependent on forest produce, the Forest Department of the Government which controls the resources from forests, the industrialists who use various forest produce, and, the wild life and nature enthusiasts.

As the local people are directly dependent on the forest, they should be given the authority to decide the management of forest produce as they use traditional methods of exploitation of these resources which ensure that the resources are used in a sustainable manner. Moreover, their existence is directly dependent on these forests and therefore they will not exploit the resources in a manner that could lead to deforestation.

TOPIC 4

WATER FOR ALL

Water is a basic necessity for all terrestrial forms of life. Human intervention also changes the availability of water in various regions. Failure to sustain water availability underground has resulted from the loss of vegetation cover, diversion for high water demanding crops, and pollution from industrial effluents and urban wastes.

Irrigation methods like dams, tanks and canals have been used in various parts of India since ancient times. The use of this stored water was strictly regulated and the optimum cropping patterns based on the water availability were arrived at on the basis of decades/centuries of experience and the maintenance of these irrigation systems was also a local affair. The arrival of the British changed these systems as it changed many other things.

The conception of large scale projects—large dams and canals traversing large distances were first conceived and implemented by the British and carried on with no less gusto by our newly formed independent government. These mega-projects led to the neglect of the local irrigation methods, and the government also increasingly took over the administration of these systems leading to the loss of control over the local water sources by the local people.

Mismanagement of Water

- (1) Canal systems leading from these dams can transfer large amounts of water great distances.

However, mismanagement of the water has largely led to the benefits being cornered by a few people.

- (2) There is no equitable distribution of water, thus people close to the source grow water intensive crops like sugarcane and rice while people farther downstream do not get any water.
- (3) The woes of these people who have been promised benefits which never arrived are added to the discontentment among the people who have been displaced by the building of the dam and its canal network.

Problems Caused by Building Dams

Criticisms about large dams address three problems in particular:

- (1) Social problems because they displace large number of peasants and tribals without adequate compensation or rehabilitation.
- (2) Economic problems because they swallow up huge amounts of public money without the generation of proportionate benefits.
- (3) Environmental problems because they contribute enormously to deforestation and the loss of biological diversity.

Watershed Management

- (1) Watershed management emphasises scientific soil and water conservation in order to increase the biomass production.

and water, to produce secondary resources of plants and animals for use in a manner which will not cause ecological imbalance.

- (3) Watershed management not only increases the production and income of the watershed community, but also mitigates droughts and floods and increases the life of the downstream dam and reservoirs.
- (4) Various organisations have been working on rejuvenating ancient systems of water harvesting as an alternative to the 'mega-projects' like dams.

Water Harvesting

Water harvesting is an age-old concept in India. Some of the ancient water-harvesting techniques used in different parts of our country are given below:

Region	Ancient Water harvesting structure
Rajasthan	Khadins, tanks and nadis
Maharashtra	Bandharas and tals
Madhya Pradesh and Uttar Pradesh	Bundhis
Bihar	Ahars and pynes
Himachal Pradesh	Kulhs

Summa region	Form
Tamil Nadu	Eris (Tanks)
Kerala	Surangams
Karnataka	Kattas

Water harvesting techniques are highly locale specific and the benefits are also localised. In largely level terrain, the water harvesting structures are mainly crescent shaped earthen embankments or low, straight concrete and rubble "check dams" built across seasonally flooded gullies. Monsoon rains fill ponds behind the structures. Only the largest structures hold water year round; most dry up six months or less after the monsoons.

Their main purpose, however, is not to hold surface water but to recharge the ground water beneath.

The advantages of water stored in the ground are many.

- (1) It does not evaporate, but spreads out to recharge wells.
- (2) It provides moisture for vegetation over a wide area.
- (3) It does not provide breeding grounds for mosquitoes like stagnant water collected in ponds or artificial lakes.
- (4) The ground-water is also relatively protected from contamination by human and animal waste.

TOPIC 5

COAL AND PETROLEUM

Coal and petroleum were formed from the degradation of bio-mass millions of years ago and hence these are resources that will be exhausted in the future no matter how carefully we use them.

Since coal and petroleum have been formed from bio-mass, in addition to carbon, these contain hydrogen, nitrogen and sulphur. When these are burnt, the products are carbon dioxide, water, oxides of nitrogen and oxides of sulphur. When combustion takes place in insufficient air (oxygen), then carbon monoxide is formed instead of carbon dioxide.

The oxides of sulphur and nitrogen and carbon monoxide are poisonous at high concentrations and carbon dioxide is a green-house gas.

Coal and petroleum are huge reservoirs of carbon and if all of this carbon is converted to carbon dioxide, then the amount of carbon dioxide in the atmosphere is going to increase leading to intense global warming. Thus, we need to use these resources judiciously.

Example 5. Case Based:

Coal is used in thermal power stations and petroleum products like petrol and diesel are used in means of transport like motor vehicles, ships and aeroplanes. We cannot really imagine life without a number of electrical appliances and constant use of transportation. So can you think of ways in which our consumption of coal and petroleum products be reduced?

You must have heard of the Euro I and Euro II norms for emission from vehicles. Find out how these norms work towards reducing air pollution

[NCERT Activity 16.11, 16.12]

- (A) Which of the following ways can help in reducing the consumption of coal and petroleum?
 - (I) Using filament type bulbs instead of Compact Fluorescent Lamps and LEDs.
 - (II) Avoid using the stairs.
 - (III) Wearing an extra sweater on cold days

- (a) Both (I) and (II)
 - (b) Both (II) and (III)
 - (c) Both (III) and (IV)
 - (d) Both (I) and (IV)
- (B) Coal and petroleum should be used judiciously to reduce:
- (a) Floods
 - (b) Draughts
 - (c) Desertification
 - (d) Global warming
- (C) Why is it important to increase efficiency of machines used for transportation?
- (D) What are Euro I and Euro II norms?
- (E) Assertion (A) : Management and conservation of coal and petroleum is different from management of water, forests and wildlife.
- Reason (R) : Burning of coal and petroleum produces pollution.
- (a) Both (A) and (R) are true and (R) is the correct explanation of the assertion.
 - (b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion.
 - (c) (A) is true, but (R) is false.
 - (d) (A) is false, but (R) is true.

Ans. (A) (c) Both (III) and (IV)

Explanation: Wearing an extra sweater on cold days will help in reducing the need for a heater and similarly using pressure cookers for cooking food will reduce the need for fuel. However, we

and LEDs instead of filament type bulbs and use stairs instead of lifts to save energy and hence consumption of coal and petroleum.

(B) (d) Global warming

Explanation: Burning of fossil fuels such as coal and petroleum produces carbon dioxide, among other harmful gases such as oxides of sulphur and nitrogen. As carbon dioxide is a greenhouse gas, it leads to global warming.

(C) Fuel is most commonly used in internal combustion engines for transportation. Efficiency of these machines should be increased by ensuring complete combustion in these engines in order to reduce air pollution.

(D) Euro norms refer to the permissible emission levels, for both petrol and diesel vehicles, which have been implemented in Europe. The Euro norms require manufacturers to reduce the existing polluting emission levels in a more efficient manner by making certain technical changes in their vehicles.

(E) (b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion

Energy Conservation

Some simple choices can make a difference in our energy consumption patterns.

- (1) Taking a bus, using your personal vehicle or walking/cycling.
- (2) Using bulbs or fluorescent tubes in your homes.
- (3) Using the lift or taking the stairs.
- (4) Wearing an extra sweater or using a heating device (heater or 'sigri') on cold days.

TOPIC 6

AN OVERVIEW OF NATURAL RESOURCE MANAGEMENT

Sustainable management of natural resources is a difficult task. We need to accept that people will act with their own best interests as the priority. But the realisation that such selfish goals will lead to misery for a large number of people and a total destruction of our environment is slowly growing. We need to tailor our requirements, individually and collectively, so that the benefits of development reach everyone now and for all generations to come.

Example 6. How can you as an individual contribute or make a difference to the management of (A) forests and wildlife, (B) water resources and (C) coal and petroleum? [NCERT]

Ans. (A) Contribution towards management of forests and wildlife

- (1) The forest products should be used judiciously.
- (2) Poaching and hunting of wild animals for their skin, horn etc should be banned.
- (3) Afforestation should be practiced more and more
- (4) Management of forests should be handed over to the local people.

(B) Contribution towards management of water resources.

stopping dumping of industrial wastes in water bodies.

- (2) Use of fertilizers and pesticides should be minimized as they contaminate water bodies and soil.
 - (3) Traditional methods of water harvesting should be revived and rainwater harvesting should be made compulsory in housing societies, schools, offices etc.
- (C) Contribution towards management of coal and petroleum
- (1) Alternate renewable sources of energy should be developed that minimize environmental pollution.
 - (2) Use of fuels that produce less pollution such as CNG and LPG should be promoted.
 - (3) Use of energy efficient devices and habits should be encouraged.

Example 7. Can you suggest some changes in your school which would make it environment friendly? [NCERT]

Ans. Following changes are suggested to make school environment friendly:

- (1) Waste materials such as foils, used papers, empty packets should be first segregated and then disposed in separate bins.
- (2) Use of non-biodegradable materials should be refused.
- (3) Solar panels should be installed on rooftops to save electricity.
- (4) Rainwater harvesting should be done so that groundwater is recharged.
- (5) The 5R's namely, Refuse, Reduce, Reuse, Repurpose and Recycle should be practised.

Example 8. Case Based:

Find out about the international norms to regulate the emission of carbon dioxide. Have a discussion in class about how we can contribute towards meeting those norms.

There are a number of organisations that seek to spread awareness about our environment and promote activities and attitudes that lead to the conservation of our environment and natural resources. Find out about the organisation(s) active in your neighbourhood/village/town/city.

[NCERT Activity 16.1, 16.2]

- (A) Which of the following greenhouse gas is present in very large quantities?
- (a) Ozone
 - (b) Methane
 - (c) Carbon dioxide
 - (d) Propane

statements given below:

- (a) Increased emission of greenhouse gases is a natural process.
 - (b) Life on earth is possible due to presence of greenhouse gases.
 - (c) Greenhouse effect is a natural process that maintains earth's temperature.
 - (d) More is the emission of greenhouse gases, more is the temperature of the earth's atmosphere.
- (C) Which of the following are the causes of increased emission of carbon dioxide in India?
- (I) burning of coal for power generation
 - (II) Increased vegetation cover during monsoon.
 - (III) Burning of agricultural wastes
 - (IV) Burning of fossil fuels for transportation
- (a) Only (I)
 - (b) Only (II)
 - (c) (I), (II) and (IV)
 - (d) (I), (III) and (IV)
- (D) Which one of the following cannot be a goal or an international norm to regulate the emission of carbon dioxide:
- (a) To limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets.
 - (b) To monitor actual emission of greenhouse gases.
 - (c) To invest in technological development in the developing countries.
 - (d) To assist countries in adapting to the adverse effects of climate change.
- (E) One of the ways individuals can contribute towards conservation of environment and natural resources is:
- (a) Recycling, reusing, and composting
 - (b) Making better transport choices
 - (c) Reducing your electricity usage
 - (d) All of the above

Ans. (A) (c) Carbon dioxide

Explanation: The amount of carbon dioxide in the atmosphere is the highest among the greenhouse gases due to rampant burning of fossil fuels for heating and generation of electricity.

(B) (a) Increased emission of greenhouse gases is a natural process.

Explanation: The greenhouse effect is a natural process that warms the Earth's surface.

atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by greenhouse gases. Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs). The absorbed energy warms the atmosphere and the surface of the Earth. This process maintains the Earth's temperature at around 33 degrees Celsius warmer than it would otherwise be, allowing life on Earth to exist.

The problem we now face is that human activities – particularly burning fossil fuels (coal, oil and natural gas), agriculture and land clearing – are increasing the concentrations of greenhouse gases. This is the enhanced greenhouse effect, which is contributing to warming of the Earth.

(C) (d) (I), (III) and (IV)

Explanation: The level of carbon dioxide in the atmosphere is very high in India due to the burning of fossil fuels such as coal, petroleum and natural gas for meeting our energy requirements. Also, burning of agricultural wastes or stubble is another factor contributing to increased level of CO₂ gas. However, during monsoon, the vegetation cover increases which increases the rate of photosynthesis and hence level of CO₂ is low during this period.

(D) (c) To invest in technological development in the developing countries.

Explanation: The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that (part one) global warming is occurring and (part two) that human-made CO₂ emissions are driving it. Although it has scope of assisting countries in adapting to the adverse effects of climate change, it does not have scope for investing in technological development in the developing countries.

(E) (d) All of the above

Example 9. Make a list of forest produce that you use. What do you think a person living near a forest would use? What do you think a person living in a forest would use? Discuss with your classmates how these needs differ or do not differ and the reasons for the same. Find out about any two forest produces that are the basis for an industry. Discuss whether this industry is sustainable in the long run. Or do we need to control our consumption of these products?

[NCERT Activity 16.6, 16.7]

directly or indirectly from forest produce used by most urban people?

- (a) Paper
- (b) Natural gas
- (c) Timber
- (d) Dyes

(B) The table below lists the various stakeholders in forests. Select the row containing incorrect information:

Stakeholders	Justification
(a) People who live in or around forests	Dependent on forest produce for various aspects of their life
(b) Forest Department of the Government	Owens land and controls the resources from forests
(c) Industrialists	Dependent on forests in any one area as they use various forest produce
(d) wild life and nature enthusiasts	Want to conserve nature in its pristine form

(C) Which of the following forest produce are used by the persons living in a forest?

- (I) Firewood and small timber
 - (II) Bamboo
 - (III) Various agricultural implements made of iron and steel
 - (IV) Fruits, nuts and medicines
- (a) Both (I) and (II)
 - (b) Both (II) and (IV)
 - (c) (II), (III) and (IV)
 - (d) (I), (II) and (IV)

(D) For which of the following needs are people living near forests dependent on forests?

- (a) Fodder, fruit and agricultural implements
- (b) Fuel, fodder and monoculture
- (c) Fuel, fodder and cultivation
- (d) Minerals, fodder and fuel

(E) We should conserve forests because:

- (a) Forest provide us with oxygen and they cause rainfall.
- (b) Forest prevents soil erosion.
- (c) Various forest products are used as raw materials in industries.
- (d) All of the above

Explanation: Forests give us a lot of useful products such as paper, timber, dyes, medicines, fruits, spices, dyes and oils. Natural gas on the other hand is a fossil fuel formed from the plants, animals, and microorganisms that lived millions of years ago.

(B) (c) *Stakeholders: Industrialist; Justification: Dependent on forests in any one area as they use various forest products.*

Explanation: Industrialists use various forest produce as raw materials or for business, but are not dependent on the forests in any one area.

(C) (d) (I), (II) and (IV)

Explanation: The local people are dependent directly on forests as they need large quantities of firewood, small timber and thatch. Bamboo is used to make slats for huts, and baskets

implements for agriculture, fishing and hunting are largely made of wood. Forests are sites for fishing and hunting. In addition to people gathering fruits, nuts and medicines from the forests, their cattle also graze in forest areas or feed on other fodder which is collected from forests.

(D) (a) *Fodder, fruit and agricultural implements*

Explanation: People living near forests are dependent on forests for fodder for their cattle, fruits and nuts, agricultural implements as they are made largely of wood and bamboo to make slats for their huts.

(E) (d) *All of the above*

Explanation: Conservation of forests is the need of the hour as forests provide us with oxygen, they prevent soil erosion, various industries are dependent upon forests for their raw materials and medicines.

OBJECTIVE Type Questions

[1 mark]

Multiple Choice Questions

1. Which one of the following is responsible for the water?
 - (a) Loss of vegetation cover
 - (b) Diversion for high water demanding crops
 - (c) Pollution from urban wastes
 - (d) Afforestation [CBSE 2020]
2. Which of the following are water intensive crops?
 - (a) Wheat and rice
 - (b) Wheat and sugarcane
 - (c) Sugarcane and rice
 - (d) Wheat and gram

Ans. (c) *Sugarcane and rice.*



Related Theory


Construction of large dams leads to some problems.

People close to the source grow water intensive crops like sugarcane and rice whereas people farther downstream do not get sufficient water to grow these crops. This causes social problems resulting due to unequal distribution of water. Other problems related to construction of dams are economic and environmental problem.


3. Consider the following criticisms that are generally addressed when a new project is launched:
 - (I) Displacement of peasants and local tribals without compensation.
 - (II) Swallowing up large amount of public money without any benefits.

The criticisms about large dams in particular are:

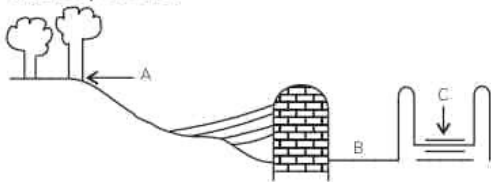
- (a) (I) and (II)
- (b) (II) and (III)
- (c) (I) and (III)
- (d) (I), (II) and (III) [CBSE 2020]

4.  The Reni village of Garhwal is famous for:
- (a) Monocultures of pine, teak and eucalyptus.
 - (b) Chipko Movement.
 - (c) Extensive biodiversity.
 - (d) Participation of local people in efficient management of forests. [CBSE 2020]
5. Which one of the following stakeholders of forests causes the maximum damage to forest?
- (a) People who live in or around the forest
 - (b) The forest department of the government
 - (c) The wildlife and native enthusiasts
 - (d) The industrialists

Ans. (d) *The Industrialist*
[CBSE Marking Scheme 2019]

6.  Several factories were pouring their wastes in rivers A and B. Water samples were collected from these two rivers. It was observed that sample collected from river A was acidic while that of river B was basic. The factories located near A and B are:
- (a) Soaps and detergents factories near A and alcohol distillery near B.
 - (b) Soaps and detergents factories near B and alcohol distillery near A.
 - (c) Lead storage battery manufacturing factories near A and soaps and detergents factories near B.
 - (d) Lead storage battery manufacturing factories near B and soaps and detergents factories near A. [CBSE 2020]

7. A diagram of traditional water harvesting system is given below:
The statement which defines the system and its parts is:



system and A = Catchment area; B = Saline area and C = Shallow dugwell:

- (b) This is an ideal setting of the Shallow dugwell system and A = Catchment area; B = Saline area and C = Khadin.
- (c) This is an ideal setting of Catchment area and A = Khadin, B = Saline area and C = Shallow dugwell.
- (d) This is showing Saline area and A = Catchment area; B = Khadin and C = Shallow dugwell.



Ans. (a) *This is an ideal setting of Khadin system and:*

A = catchment area

B = Saline area

C = Shallow dugwell

Explanation: Khadin is a traditional rainwater harvesting system in Rajasthan. The main feature of Khadin system of rainwater harvesting is a very long earthen embankment called 'bund' built across the lower edge of the sloping farmland. The rainwater from catchment area flows down the slopes and stopped by the bund to form a reservoir the excess water flows through pathwalls (made for this purpose) and fills the shallow well dug behind the bund. This area is subsequently used for growing crops.

8.  The major ill effect of mono culture practice in forests is on the:
- (a) biodiversity which faces large destruction
 - (b) local people whose basic needs can no longer be met from such forests
 - (c) industries
 - (d) forest department [CBSE 2020]
9.  Which of the following are not responsible for failure to sustain water availability underground:
- (I) Afforestation
 - (II) Loss of vegetation cover
 - (III) Diversion for high water demanding crops
 - (IV) Pollution from industrial effluents and urban wastes.
- (a) Only (I)
 - (b) Only (II)
 - (c) Both (I) and (III)
 - (d) Both (II) and (IV)

in confirming the contamination of river water?

- (I) Measurement of pH of river water
- (II) Existence of diverse life forms in river water
- (III) Presence of chlorine in river water
- (IV) Presence of coliform bacteria in river water

Choose the correct option from the following:

- (a) (I) and (III)
- (b) (II) and (III)
- (c) (I) and (IV)
- (d) (II) and (IV)

11. Choose the correct statements among the following that are a consequence of raising the height of dams

- (I) Deforestation and the loss of biological diversity.
- (II) Displacement of large number of peasants and tribals without adequate compensation or rehabilitation
- (III) Loss of valuable agricultural land.
- (IV) Generation of permanent employment for local people

- (a) Both (I) and (II)
- (b) Both (II) and (IV)
- (c) (I), (II) and (III)
- (d) (I), (III) and (IV)

12. Which of these practices can be adopted to save the environment?

- (a) Refuse the use of single-use plastic bags
- (b) Reduce the use of paper bags
- (c) Recycle single-use bags
- (d) Reuse waste food

Ans. (a) Refuse the use of single-use plastic bags

Explanation: The 5R's to save the environment are: Refuse, Reduce, Reuse, repurpose and Recycle. The best way to save the environment is by refusing to use products that may harm the environment.

13. How does switching off unnecessary electrical appliances help the environment?

- (a) It generates electricity when switched off
- (b) It reduces wastage of energy
- (c) It recycles the amount of energy used
- (d) It increases the efficiency of the electrical appliances

14. Which of these is an example of sustainable development in order to conserve natural resources for the future generation?

- (a) Cleaning water resources
- (b) Finding additional fuel reserves

(d) Planning for safe disposal of wastes after mining

15. Which of the following industries would be identified as a stakeholder involved in a forest?

- (a) That manufacture ceramic products using clay
- (b) That make papers using wood products
- (c) That make clothes using synthetic materials
- (d) That manufacture devices that generate electricity using solar energy

16. Which of the following practices will help to conserve the forest?

- (a) Deforestation
- (b) Banning deforestation
- (c) Increased use of firewood by local people
- (d) Increased use of timber by industries

17. Which of these explains the use of dams?

- (a) To replenish underground water resources
- (b) To produce steady supply of water in hilly regions
- (c) To provide irrigation and generate electricity
- (d) To provide water for conservation of biological diversity

18. Which of the following steps should be adopted in order to save the environment?

- (a) Replace coal to firewood for cooking food
- (b) Replace petroleum to coal in vehicles for transportation
- (c) Replace thermal power with solar power to generate electricity
- (d) Replace the use of coal to petroleum for melting metals in a furnace

Assertion-Reason Questions

For the following questions, two statements are given – one labeled Assertion (A) and other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :

- (a) Both (A) and (R) are true and (R) is the correct explanation of the assertion.
- (b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion.
- (c) (A) is true, but (R) is false.
- (d) (A) is false, but (R) is true.

implies a change in all aspects of life.

Reason (R) : Economic development is linked to environmental conservation.

Ans. (a) Both (A) and (R) are true and (R) is the correct explanation of the assertion.

Very Short Answer Type Questions

20. Make a list of few industries that are dependent on forest products.

Ans. Forest product dependent industries are: Timber, paper, lac and sports equipment industries.

reason.

Ans. Water conservation is necessary as availability of water on Earth is more than enough for all but due to its uneven distribution, wide seasonal fluctuations in rainfall and majority of available water being saline, conservation is highly important for future generations.

22. How is the increase in demand for energy affecting atmosphere?


Ans. Over consumption and increase in demand of fossil fuels releases a huge amount of polluting gases into the atmosphere, which in turn causes global warming and also produces acid rain.

COMPETENCY BASED Questions (CBQs)

[1, 4 & 5 marks]

23. Find out about the international norms to regulate the emission of carbon dioxide. Have a discussion in class about how we can contribute towards meeting those norms.

There are a number of organisations that seek to spread awareness about our environment and promote activities and attitudes that lead to the conservation of our environment and natural resources. Find out about the organisation(s) active in your neighbourhood/village/town/city. [NCERT Activity 16.1, 16.2]

(A)  Which of the following greenhouse gas is present in very large quantities?
(a) Ozone (b) Methane
(c) Carbon dioxide (d) Propane

(B) Select the incorrect statement from the statements given below:

- (a) Increased emission of greenhouse gases is a natural process.
- (b) Life on earth is possible due to presence of greenhouse gases.
- (c) Greenhouse effect is a natural process that maintains earth's temperature.
- (d) More is the emission of greenhouse gases, more is the temperature of the earth's atmosphere.

(C)  Which of the following are the causes of increased emission of carbon dioxide in India?

(I) Burning of coal for power generation

(II) Increased vegetation cover during monsoon.

(III) Burning of agricultural wastes

(IV) Burning of fossil fuels for transportation

(a) Only (I) (b) Only (II)

(c) (I), (II) and (IV) (d) (I), (III) and (IV)

(D) Which one of the following cannot be a goal or an international norm to regulate the emission of carbon dioxide:

(a) To limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets.

(b) To monitor actual emission of greenhouse gases.

(c) To invest in technological development in the developing countries.

(d) To assist countries in adapting to the adverse effects of climate change.

(E) One of the ways individuals can contribute towards conservation of environment and natural resources is:

(a) Recycling, reusing, and composting

(b) Making better transport choices

(c) Reducing your electricity usage

(d) All of the above

is a natural process.

Explanation: The greenhouse effect is a natural process that warms the Earth's surface. When the Sun's energy reaches the Earth's atmosphere, some of it is reflected back to space and the rest is absorbed and re-radiated by greenhouse gases. Greenhouse gases include water vapour, carbon dioxide, methane, nitrous oxide, ozone and some artificial chemicals such as chlorofluorocarbons (CFCs). The absorbed energy warms the atmosphere and the surface of the Earth. This process maintains the Earth's temperature at around 33 degrees Celsius warmer than it would otherwise be, allowing life on Earth to exist.

The problem we now face is that human activities – particularly burning fossil fuels (coal, oil and natural gas), agriculture and land clearing – are increasing the concentrations of greenhouse gases. This is the enhanced greenhouse effect, which is contributing to warming of the Earth.

- (D) (c) To invest in technological development in the developing countries.

Explanation: The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that (part one) global warming is occurring and (part two) that

Although it has scope of assisting countries in adapting to the adverse effects of climate change, it does not have scope for investing in technological development in the developing countries.

- (E) (d) All of the above

Explanation: Individuals can contribute towards conservation of environment and natural resources by reusing, recycling of waste materials, composting of organic wastes, making better transport choices and using public transport as much as possible and reducing electricity usage.

24. Make a list of forest produce that you use. What do you think a person living near a forest would use? What do you think a person living in a forest would use? Discuss with your classmates how these needs differ or do not differ and the reasons for the same. Find out about any two forest produce that are the basis for an industry. Discuss whether this industry is sustainable in the long run. Or do we need to control our consumption of these products? [NCERT Activity 16.6, 16.7]

- (A) Which of the following are not products derived directly or indirectly from forest produce used by most urban people?
(a) Paper (b) Natural gas
(c) Timber (d) Dyes
- (B) The table below lists the various stakeholders in forests. Select the row containing incorrect information:

	Stakeholders	Justification
(a)	People who live in or around forests	Dependent on forest produce for various aspects of their life
(b)	Forest Department of the Government	Owens land and controls the resources from forests
(c)	Industrialists	Dependent on forests in any one area as they use various forest produce
(d)	wild life and nature enthusiasts	Want to conserve nature in its pristine form

- (C) Which of the following forest produce are used by the persons living in a forest?

- (I) Firewood and small timber
(II) Bamboo
(III) Various agricultural implements made of iron and steel
(IV) Fruits, nuts and medicines
(a) Both (I) and (II)
(b) Both (II) and (IV)

(c) (II), (III) and (IV)

(d) (I), (II) and (IV)

- (D) For which of the following needs are people living near forests dependent on forests?
(a) Fodder, fruit and agricultural implements
(b) Fuel, fodder and monoculture
(c) Fuel, fodder and cultivation
(d) Minerals, fodder and fuel

- (a) Forest provide us with oxygen and they cause rainfall.
- (b) Forest prevents soil erosion.
- (c) Various forest products are used as raw materials in industries.
- (d) All of the above

Ans. (A) (b) Natural gas

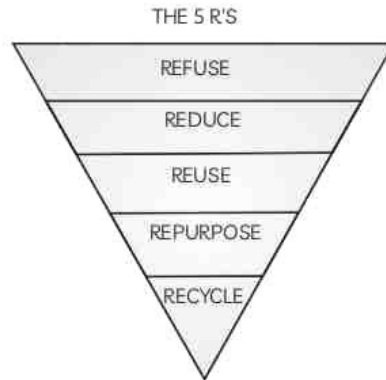
Explanation: Forests give us a lot of useful products such as paper, timber, dyes, medicines, fruits, spices, dyes and oils.

fuel formed from the plants, animals, and microorganisms that lived millions of years ago.

(E) (d) All of the above

Explanation: Conservation of forests is the need of the jour as forests provide us with oxygen, they prevent soil erosion, various industries are dependent upon forests for their raw materials and medicines.

25. Usually we put recycling on top of everything, but today on the 5 R process, it comes in last. Five actions should respectively be taken if possible before recycling any products. These R's include: refuse, reduce, reuse, repurpose and finally, recycle. This is an important methodology for businesses to follow to ensure they can reduce waste and boost their recycling efforts. This ultimately lessens the amount of waste that will end up in landfill and will optimise your recycling programs.



(A) The main items that can be recycled are:

- (I) Lead-Acid Batteries
- (II) Plastic (PET) bottles
- (III) Egg cartons
- (IV) Steel cans

Select the correct options from below:

- (a) Both (I) and (II)
- (b) Both (II) and (III)
- (c) (I), (II) and (III)
- (d) (I), (II) and (IV)

(B) The table below gives the meaning of the terms Reuse, reduce and reuse. Select the row containing the correct meaning of the three terms:

	Refuse	Reduce	Reuse
(a)	Use less of something	Use something over and over again	Make something into something new
(b)	Make something into something new	Use less of something	Use something over and over again
(c)	Say no to things that can harm environment	Use less of something	Use something over and over again.
(d)	Say no to things that can harm environment	Use something over and over again.	Use less of something

appropriately managed?

- (a) Composting (b) Recycling
(c) Burning (d) Melting
- (D) Look at the figure below and suggest which out of the five 'R's is represented below:



- (a) Reuse, as plastic bottle is being used again.
(b) Repurpose, as the plastic bottle is being used for a different purpose.
(c) Reduce, as less of the thing is being used.
(d) Recycle, as plastic bottle is being recycled.
- (E) The doorstep delivery of milk in glass bottles is an example of:
- (a) Reduce (b) Reuse
(c) Repurpose (d) Recycle

Ans. (A) (d) (I), (II) and (IV)

Explanation: Among the items that can be recycled are lead acid batteries, plastic bottles, steel and aluminium cans, glass bottles, paper, cardboard boxes. Among the items that cannot be recycled are egg cartons, plastic shopping bags, drinking cups, plastic utensils and broken or sharp glass.

- (E) (b) Reuse

Explanation: Reuse is the action or practice of using an item by taking, but not reprocessing, previously used items and it helps save time, money, energy and resources. In the doorstep delivery of milk in glass bottles, the delivery person gives a bottle containing fresh milk and the empty bottle is returned to him the next day. In this way, the glass bottles are reused.

26. Fossil fuels like coal, oil, and natural gas present environmental problems starting with their extraction and going all the way

in their properties and uses, but they have some similarities. We use fossil fuels for most of our energy needs today. Coal, natural gas, and oil accounted for 87 percent of global primary energy consumption. Burning coal for electricity is in decline, while the use of natural gas, solar and wind power are on the rise.



Complete combustion of coal and petroleum:

- (I) increases air pollution
(II) increases efficiency of machines.
(III) reduces global warming.
(IV) produce poisonous gases.

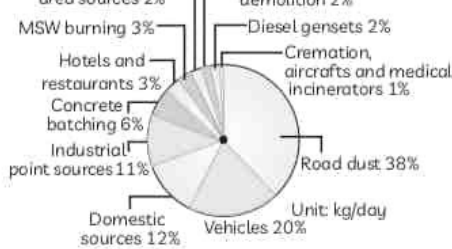
The correct option is:

- (a) (I) and (II) (b) (II) and (IV)
(c) (II) and (III) (d) (III) and (IV)

[CBSE 2020]

27. Half of Delhi's school-going population (some 2.2 million children) suffers from some or the other form of irreversible lung damage from poor air quality in the city. Research is now showing that pollution can weaken a child's immune system and increase the risk of cancer, epilepsy, diabetes and even adult-onset diseases like multiple sclerosis. In adults, poor air quality causes one's lung capacity to decrease, more headaches, sore throats, coughs, fatigue, even lung cancer.

In 2017, air pollution was the fifth-highest mortality risk factor globally – linked to 4.9 million deaths and 147 million years of healthy life otherwise lost. Reducing global air pollution to levels recommended by the WHO would increase life expectancy worldwide as much as eradicating breast and lung cancer would, according to a Quartz report from earlier this year. Going by National Health Profile of India 2015 report, there were 3.5 million reported cases of acute respiratory infection nationwide last year – a 1,40,000 increase on the previous year, and a 30 percent increase since 2010. The pie chart below shows the average levels of fine particulate matter having diameter less than 2.5 micrometers (PM_{2.5}) in Delhi in the month of Nov 2020.



- (A) According to the pie chart shown, the major contributors responsible for more than 80% of PM_{2.5} in air are:
- Road dust, Construction and demolition, hotels and restaurants, Industrial point sources
 - Road dust, domestic sources, Diesel gensets, Industrial point sources
 - Road dust, vehicles, Construction and demolition and Industrial point sources
 - Road dust, vehicles, domestic sources and Industrial point sources
- (B) The major air pollutants are:
- Nitrogen dioxide
 - Sulphur
 - Particulate matter
 - Ozone
- Both (I) and (II)
 - Both (II) and (III)
 - (I), (III) and (IV)
 - (I), (II) and (III)
- (C) Which of the following element is not present in coal and petroleum:
- Silicon
 - Carbon
 - Hydrogen
 - Sulphur
- (D) The number of years our known petroleum and coal reserves will last as per the present estimates is given in the table below.

Select the row containing the correct values:

	Number of years our known petroleum reserves will last	Number of years our known coal reserves will last
(a)	100	300
(b)	40	200
(c)	400	300
(d)	200	40

The main reason for using coal and petroleum judiciously is:

- These lead to global warming
- These pollute our environment
- These are not limited
- These are not inexhaustible

Ans. (B) (c) (I), (III) and (IV)

Explanation: The major air pollutants are: Ozone (O₃), Nitrogen dioxide, Carbon Monoxide (CO), Sulphur Dioxide (SO₂) and Particulate Matter (PM₁₀ and PM_{2.5})

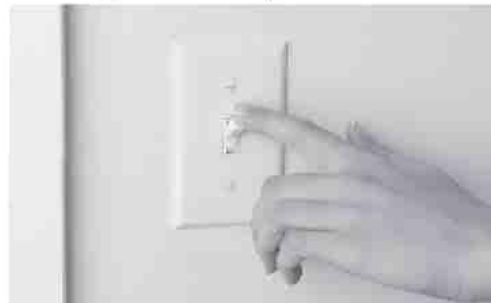
(C) (a) Silicon

Explanation: Coal and petroleum have been formed from biomass and contain carbon, hydrogen, nitrogen and sulphur.

(D) (b) Number of years our known petroleum reserve will last: 40; Number of years our known coal reserves will last: 200.

Explanation: As per the present estimates, the number of years our known petroleum and coal reserves will last are 40 years and 200 years respectively. This estimate is based on the present rate of usage of these fuels.

28. When Sukanya visited her maternal grandparents during her school vacations, she observed that both her grandparents would switch off lights and fans when not in use. They would in fact encourage them also to use natural light as much as possible.



Switching off unnecessary lights and fans and repairing leaking taps correctly defines which term of 5R's?

- Recycle
- Reuse
- Repurpose
- Reduce

[CBSE 2020]

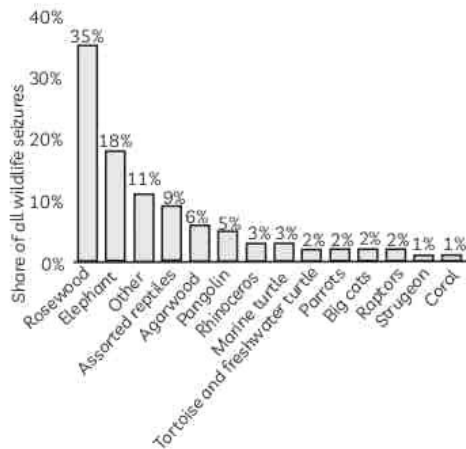
Ans. (d) Reduce

Explanation: We can reduce the voltage of electricity by switching off unnecessary lights and We can reduce the voltage of water by repairing the leaking taps.

metal items and recycle these materials to make required things.

- (2) Reuse means to use the same things again e.g. Plastic bottles of some or pickles can be used for storing things in the kitchen.
- (3) Repurpose: The object which can no more be used for the original purpose e.g. cups with broken handles can be used to grow small plants and as feeding vessels for birds.
- (4) Refuse to take the things people offer you that you don't need or are harmful to the environment, e.g., take your own cloth or jute bag for shopping and refuse to accept plastic bag.

29. Poachers, traffickers and highly-organised criminal gangs decimate already endangered wildlife species, reaping a deadly harvest in the pursuit of profits. To address the problem, in 1973 the United Nations General Assembly signed the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), aimed at stemming the illegal trade in wild animals and rare commodities. UN World Wildlife Day is held each year on the anniversary of the signing. The day helps raise awareness of the many challenges facing the world's wild animals and plants and the efforts to stamp out illegal trading.



- (A) (4) The main objective of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is that it:
- (I) Ensures that some species entering into international trade is threatened with extinction.
 - (II) Promotes the conservation and sustainable use of biodiversity
 - (III) Contributes to tangible benefits for poachers

endangered species

- (a) Both (I) and (II)
- (b) Both (II) and (III)
- (c) Both (III) and (IV)
- (d) Both (II) and (IV)

- (B) Which of the following is a step taken by the government to protect the wildlife?
- (a) Various Project to protect animals in forest
 - (b) Proper food facilities to the animals in forest
 - (c) Deforestation to provide space for urbanization
 - (d) Control the population of animals in forest
- (C) (2) Which of the following is the most important human activity leading to the extinction of wildlife?
- (a) Increased pollution of air, water and land
 - (b) Alteration and destruction of the natural habitats.
 - (c) Hunting of wild animals for valuable wildlife products
 - (d) Afforestation
- (D) (2) Which of the following will not be a result of uncovering half of the forest covering of the earth?
- (a) Some wildlife species will become extinct
 - (b) Soil erosion will increase
 - (c) It will lead to climatic changes
 - (d) Forest dwelling people will be benefitted.
- (E) Which of the following is the name given to a scheme to protect and conserve bio-diversity?
- (a) Biosphere
 - (b) Biotechnology
 - (c) Bio-reserve
 - (d) Bio-ecology

Ans. (B) (a) Various Project to protect animals in forest

Explanation: The Government of India has taken various steps to conserve the wildlife. The major among them is establishing of various projects in order to protect the wildlife. Some of the projects are Project Tiger, Project Rhino, Project Great Indian Bustard and many more.

(E) (c) Bio-reserve

Explanation: Bio-reserve is a scheme to protect and conserve bio-diversity. The central area preserves the flora and fauna. The surrounding zone is utilized for research and experiments regarding conservation of bio-diversity.

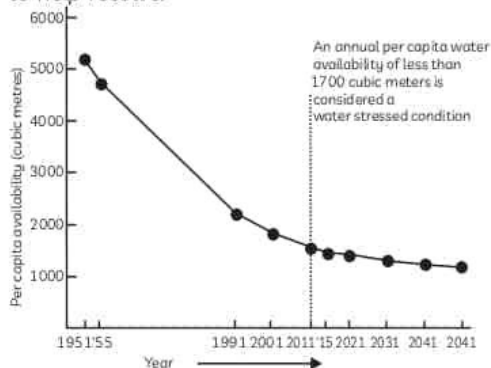
plan was inaugurated by late Rajiv Gandhi at Rajendra Prasad Ghat of Banaras. The National Protection Agency was constituted for its implementation. During the first phase of Ganga Action Plan 256 schemes of 462 crores were undertaken in Uttar Pradesh, Bihar and West Bengal. Special stations have been created to check the quality of water. The experts from Bharat Heavy Electricals Limited and National Environment Engineering Research Institute were appointed to check the quality of the water.



The main purpose of the 'Ganga Action Plan' (GAP) project launched by the government in 1985 was to:

- (a) Build new dams over the Ganga river
- (b) Make its water pollution free
- (c) Utilize the river water for irrigation purposes
- (d) Promote the growth of water sports in the river

31. India's water situation is dire. There are no two ways around it. Around 2,00,000 people die every year due to inadequate access to safe water, 21 major cities will run out of groundwater by 2020, 75% of households do not have access to drinking water at home and 70% of India's water is contaminated. Plus the problem is only going to get more severe, as the population grows, while water becomes even more scarce. It should be evident, then that India is facing a water crisis, one that whoever comes to power would be expected to help resolve.



water are:

- (I) Burning of fossil fuels
- (II) Dissolved oxygen
- (III) Untreated sewage
- (IV) Agricultural runoff
- (a) Both (I) and (II)
- (b) Both (III) and (IV)
- (c) (I), (II) and (IV)
- (d) (I), (III) and (IV)

- (B) Which of the following is not the main cause of water scarcity in India?
- (a) Climate change
 - (b) River pollution
 - (c) Natural disasters
 - (d) Groundwater extraction and irrigation
- (C) The main purpose of water harvesting is to:
- (a) Use surface water for irrigation.
 - (b) Recharge ground water.
 - (c) Collect water directly for domestic use
 - (d) Refill lake water and other water bodies.
- (D) The aims of Watershed management is:
- (a) To increase the biomass production.
 - (b) To develop primary resources of land and water
 - (c) To produce secondary resources of plants and animals.
 - (d) All of the above
- (E) Some of the ancient water harvesting alongwith states where these were built are listed in the table below. Select the row containing incorrect information:

	Ancient water harvesting	State where built
(a)	Khadins	Uttar Pradesh
(b)	Bandharas	Maharashtra
(c)	Bundhis	Madhya Pradesh
(d)	Ahars	Bihar

Ans. (A) (d) (I), (III) and (IV)

Explanation: Canals, rivers and lakes in India often serve as dumping grounds for sewage, solid and liquid wastes. Water pollution is a major environmental issue in India. The largest source of water pollution in India is untreated sewage. Other sources

unregulated small-scale industry. Burning of fossil fuels releases harmful gases like carbon dioxide, oxides of sulphur and nitrogen which cause acid rain and pollute the water bodies. Dissolved oxygen, when released in water, helps aquatic plants and animals for respiration. So it does not cause pollution, but the removal of dissolved oxygen causes pollution.

(D) (d) All of the above

Explanation: Through watershed management, one can implement plans, projects that sustain and enhance watershed functions. Watershed functions include capturing, storing and recharging groundwater, filtering out water pollutants, and secure release of rainwater to avoid floods during heavy rainfalls. Watershed management emphasises scientific soil and water conservation in order to increase the biomass production. The aim is to develop primary resources of land and water, to produce secondary resources of plants and animals for use in a manner which will not cause ecological imbalance.

(E) (a) Ancient water harvesting: Khadins
State where built: Uttar Pradesh

Explanation: Water harvesting is an age-old concept in India. Khadins, tanks and nadis in Rajasthan, bandharas and tals in Maharashtra, bundhis in Madhya Pradesh and Uttar Pradesh, ahars and pynes in Bihar, kulhs in Himachal Pradesh, ponds in the Kandi belt of Jammu region, and eris (tanks) in Tamil Nadu, surangams in Kerala, and kattas in Karnataka are some of the ancient water harvesting, including water conveyance, structures still in use today.

32. Ground water, which can be used by people, constitutes only 0.8% of total water volume while the rest lies in the form of oceans and snow on mountains and glaciers. A growing population combined with huge demand of water for development purposes has put excessive stress on available water resources. The uneven distribution of water-resources, artificial modification of natural flow of rivers and human abuse are the main reasons for the looming water crisis in India. The situation of ground water is critical in Delhi, Punjab, Haryana and Rajasthan. These states need

implementation of proper water management techniques to prevent severe water crises.

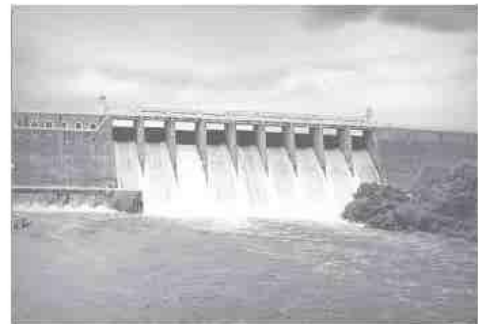


In addition to low rainfall, what are the other reasons for non-availability of water in arid and semi-arid zones of our country?

Ans. The reasons for the non-availability of water in arid and semi-arid zones of our country are:

- (1) No proper rain water harvesting systems in these areas.
- (2) Pollution of water due to mixing of industrial and domestic waste making it unfit for drinking purposes.

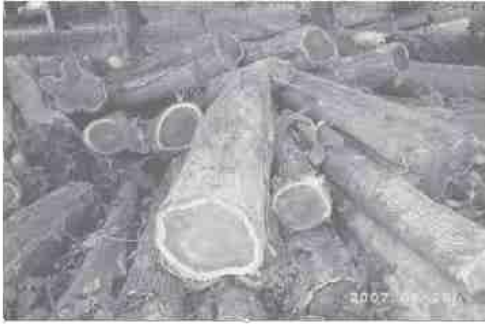
33. The Nagarjuna Sagar Dam is located in the state of Telangana. It is India's largest Masonry Dams built till date. It is the largest manmade lake in the world. It has 26 gates and is 1.55 km in length. It is situated on the river Krishna.



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

Ans. Fish populations are highly dependent upon the characteristics of their aquatic habitat which supports all their biological functions. The water stored by constructing dams is stagnant water whereas fishes breed in clean and running water due to which their population decreases and fish catch also reduces.

to observe wild life. As they were entered the forest area, they observed logs of teak wood being transported from the forest in big trucks by a contractor.



Will the local people also behave in a similar manner? Justify your answer.

Ans. No, the local people will not behave in this manner. The reason is that the local people are dependent on the forest for their day to day sustenance since generations whereas for the contractor it is just a means of earning his livelihood. Once all the trees of a particular forest have been cut, the contractor will simply move on to a new forest.

35. You must be aware that the Indus valley civilization had been famous for its irrigation and water harvesting techniques and thus when it comes to Rain Water Harvesting, India has its pride. But why is it that despite having such an elaborate system and knowledge, the

conditions. Bawaris are unique stepwells that were once a part of the ancient networks of water storage in the cities of Rajasthan. The little rain that the region received would be diverted to man-made tanks through canals built on the hilly outskirts of cities. The water would then percolate into the ground, raising the water table and recharging a deep and intricate network of aquifers. To minimise water loss through evaporation, a series of layered steps were built around the reservoirs to narrow and deepen the wells.



What are the advantages of water harvesting techniques?

Ans. Rainwater harvesting is the process of accumulating and storing rainwater for on-site use instead of allowing it to run off. Rainwater provides an independent and free water supply that offers several ways the water can be used. It reduces soil erosion and flooding, reduces demand on ground water, makes water available for non-drinking purposes and helps in plant growth

SHORT ANSWER Type I Questions (SA-I)

[2 marks]

- 36.** Explain giving example where active involvement of local people lead to efficient management of forest. [CBSE 2016]
- 37.** How did 'Chipko Andolan' ultimately benefit the local people? Explain briefly. [CBSE 2016]
- 38.** State the meaning of "biodiversity". List one advantages each of conserving forests and wild-life. [CBSE 2016]

Ans. The existence of a number various kinds of animal and plants lives together.

Advantage Conserving forest & Wild Life

- (1) It protects the endangered species.
- (2) It helps in maintaining the ecological balance.
- (3) It provides various kinds of medicine.

Related Theory

Stakeholder of forest & Wild Life: following are stakeholders:

(2) The Government, forest department.

(3) The Industries which depends upon forest goods.

SHORT ANSWER Type II Questions (SA-II)

[3 marks]

39. List four advantages of properly managed watershed management. [CBSE 2016]

40. Management of forest and wild life resources is a very challenging task. Why? Give any two reasons. [CBSE 2017]

Ans. Management of forest and wild life resources is a very challenging task because of the following reasons:

- (1) The ever increasing human and livestock population and their dependence on the forest products put a lot of pressure on the forest resources like fuel wood, fodder, timber etc. which, in turn, lead to irreversible deforestation.
- (2) Over-exploitation, overgrazing, illegal encroachments, unsustainable practices, forest fires, and environment-unfriendly development projects in the forest areas.
- (3) Lack of coordination and participation of the local communities regarding the use and management of natural resources.
- (4) Lack of environmental safeguards, comprehensive land-use policies and plans, lack of grassroots level support for conservation.
- (5) Lack of public awareness on the importance and conservation of forests and wild life.
- (6) Water scarcity, changes in rainfall pattern and global climate change

(7) Widespread poaching of wildlife for body parts such as skin and bones.

(Any 2 of 7 points can be written to get full marks)

41. Why are coal and petroleum considered as fossil fuels? Why are these not considered as renewable sources of energy? Write the name of a green house gas released on combustion of these fuels. [CBSE 2017]

42. Which natural resource is considered the 'biodiversity hot spots' and why? Suggest what may happen when there is a loss of biodiversity. [CBSE 2017]

Ans. Forest is a natural resource which considered as a biodiversity hotspot because they contain high levels of species diversity like different species of birds, animals, and plants and hence are rich in biodiversity.

loss of biodiversity leads to reduced ecosystem services due to depletion of natural resources and increase in deforestation. This had led to imbalance in food chains, increase of pollution, loss of natural habitat of birds and animals etc.



Related Theory

Biodiversity is the diversity of plant and animal life found in a particular area. Entire biosystem supports the human life and its needs.

LONG ANSWER Type Questions (LA)

[5 marks]

43. Which of the two is a better option:

(A) To collect rainwater in ponds or artificial lake or

(B) To let it recharge groundwater by water harvesting? List four advantages of the option chosen to justify your answer.

[CBSE 2016]

Ans. To recharge ground water by water harvesting is better than to collect rain water in pond or lake because.

(1) Through water harvesting. We collect clean water on the other hand in lake or pond, it mix with sand.

(2) In water harvesting no water is wasted.

(3) Water remain present in water harvesting on the other hand in ponds, fungi or algae grow in water.

(4) Evaporation does not takes place in ground water.

natural resources, explain the terms reduce, recycle and reuse.

- (B) Why is conservation of water necessary? State any four reasons. [CBSE 2017]
45. Saumya while going to her school on a bicycle observed that on each crossing when traffic lights were red, the engines of all vehicles were running idle and were emitting toxic gases. It was difficult for her to breath in such condition. As an active member of 'Eco club' of her school, she suggested to her friends to organize an 'awareness campaign' in the area and at nearby traffic lights with playcards showing 'Switch off engines when light is red'.
- (A) List two reasons/arguments that Saumya would put before her schoolmates to make them realise the need to organize an 'awareness campaign'.
- (B) Suggest two ways to reduce the consumption of fossil fuels.
- (C) State two values shown by Saumya. [CBSE 2017]
46. What is "Sustainable Management of Natural Resources"? Why is it necessary? Which one out of reuse and recycle, would you practise in your daily life and why? [CBSE 2018]

main advantages associated with water harvesting at the community level. Write two causes for the failure of sustained availability of groundwater. [CBSE 2019]

48. Suggest four approaches towards the conservation of forests. [CBSE 2019]

Ans. Approaches towards conservation of forests:

- (1) Afforestation should be practiced and promoted on a large scale by spreading more awareness.
- (2) The protected areas should be managed by local people who have a stake in these forests.
- (3) Forest fires and other hazards should be prevented and controlled with the help of modern technology and satellite imaging.
- (4) More national parks and sanctuaries should be formed to conserve the biodiversity.
- (5) Hunting should be banned and laws should be formulated against hunting.
- (6) There should be proper laws for exploitation of forest resources for personal or commercial use.

(Any 4 of 6 points can be written to get full marks)

49. What is biodiversity? Why are forests considered as "biodiversity hot spots"? List two factors responsible for causing deforestation. [CBSE 2019]



SHORT ANSWER Type-I Questions (SA-I)

[2 marks]

1. Why is sustainable management of natural resources necessary? Out of the two methods - reuse and recycle - which one would you suggest to practise and why?

Ans. Sustainable management encourages all forms of growth that are needed to meet basic human needs, while conserving natural resources for the future generations. It is necessary because, our natural resources are exhaustible, limited and non renewable. Our resources are being over exploited by the growing population and there is no equitable distribution of resources, as a handful of rich and powerful people are exploiting them to the hilt for short term benefits. So it is necessary.

I would suggest 'reuse', because in this practice no energy is wasted, and segregation of wastes is not necessary. By practising 'reuse' strategy we are also 'reducing' our consumption of resources.

[CBSE Topper 2014]

2. Write two advantages of sustainable management of natural resources. Out of the two - reuse and recycle - which is better and why?

Ans.

- Encourage the use of composting (or) vermi-composting.
- Spreading awareness about the diseases spread due to improper disposal of wastes and the breeding of mosquitoes.
- Holding staged shows to demonstrate safer ways of disposal and discussing about the health problems (malaria, dengue, jaundice) etc which may arise if harmful pathogens enter our body.
- Organizing clubs and campaigns to clean the neighbourhood every week.
- Encourage the Rs - Recycle, Reuse, Reduce to protect the environment.
- Segregating bio-degradable & non-biodegradable wastes.
- Bio-degradable wastes can be disposed by composting & incinerating.
- Non-bio-degradable wastes can be recycled, reused.
- Proper Sewage Treatment.

[CBSE Topper 2015]

- Ans.
- To Water doesn't evaporate.
 - To recharge ground water level & nearby wells
 - To provide moisture for the vegetation cover.
 - There is no breeding of mosquitoes unlike stagnant water collected in ponds (or) lakes.
- Water is protected from contamination by the humans.

[CBSE Topper 2015]

SHORT ANSWER Type-II Questions (SA-II)

[3 marks]

4. List four stakeholders which may be helpful in the conservation of forests.

- Ans.
- The four stakeholders are namely:
- * The people who live in and around the forest by seeking livelihood from forest products etc. i.e. habitants of forest.
 - * The forest department who controls the forest land and area by regulating the actions in forest by outsiders.
 - * The industrialists who procure tendu leaves from forest for making Bidi's etc.
 - * The wild life conservationists and enthusiasts who want to preserve the pristine collection of flora and fauna.

[CBSE Topper 2016]

5. The construction of large dams leads to social and environmental problems. List two problems of each category.

- Ans.
- Social problems:
- * It is because of the construction of mega projects people are displaced and no proper rehabilitation is provided.
 - * The oustees are not provided with the benefits of the construction of dams. Social problems also include their grievances faced after their displacement, livelihood is affected.
- Environmental Problems:
- * Pristine collection of flora and fauna is submerged under the dam structure.
 - * Biodiversity is completely destroyed which ultimately leads to loss of ecological stability.

[CBSE Topper 2016]

6. State two advantages of conserving (i) forests, and (ii) wild-life.

- Ans.
- Advantages of conserving forests:
- 1) More oxygen in the atmosphere.
 - 2) Reduction in global warming.

- 1) Promotes ecological stability
- 2) Maintains balance in food chain

[CBSE Topper 2017]

7. Explain two main advantages associated with water harvesting at the community level.

Ans.

→ advantages of water harvesting at community level :-

- 1) No shortage of water in dry or non-monsoon months.
- 2) Reduction of chances of droughts & famines.
- 3) Increased biomass production & more income.

[CBSE Topper 2017]

8. (A) Water is an elixir of life, a very important natural resource. Your Science teacher wants you to prepare a plan for a formative assessment activity, "How to save water, the vital natural resource". Write any two ways that you will suggest to bring awareness in your neighbourhood, on 'how to save water'.

(B) Name and explain any one way by which the underground water table does not go down further.

Ans.

- (A) 1) By making them understand the need and importance of water.
- 2) By awaring them about water saving methods like - watering plants in evening or roof top rainwater harvesting.
- 3) By making them aware of less water using habits.

(B) 1) Increasing vegetation → Increased vegetation allows percolation of water from the rain into the ground to increase water table level. We should use handpumps & wells judiciously.

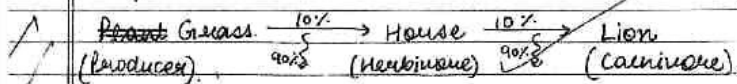
[CBSE Topper 2017]

9. What is a food chain? Why is the flow of energy in an ecosystem unidirectional? Explain briefly.

Ans.

① Food Chain is a sequence of organisms in which one consumes the other to transfer energy.

for eg.



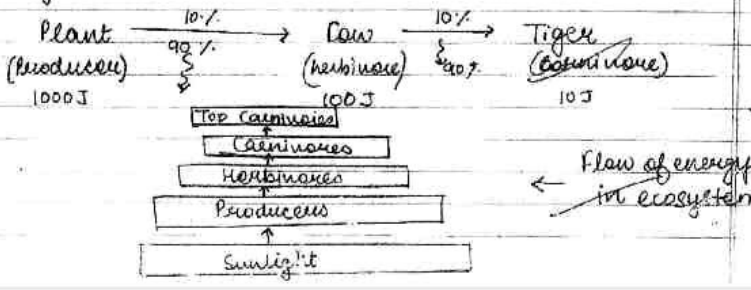
② The flow of energy in an ecosystem is always unidirectional as they cannot revert back the energy consumed or lost in environment.

③ For example, plants cannot revert back the chemical energy into solar energy.

④ Since they move progressively from one trophic level to the other, the energy content goes on decreasing according to 10% law.

they do not have that much energy to reverse the flow even if they want to.

For eg.



[CBSE Topper 2019]

10. Mention the environmental consequences of the increasing demand for energy. List four steps you would suggest to reduce the consumption of energy.

Ans.

- ① Since the industrial revolution, and the development of living standards of people, the demand for energy has also increased.
- ② This energy is mainly met by fossil fuels like coal and petroleum.
- ③ They have the following effects on environment:
 - i) Increased pollution of air, water, soil due to presence of oxides of carbon, nitrogen, sulphur.
 - ii) Coal contains carbon which leads to emission of carbon dioxide increasing green house effect.
 - iii) This leads to global warming.
 - iv) They also cause acid rain that corrodes marble on our heritage and affects plants life.

To Reduce their consumption:

- 1) we must use alternatives like CNG which are cleaner fuels.
- 2) We must develop healthy habits like using public transport instead of private.
- 3) we must harness non-conventional sources of energy.
- 4) we must make people aware of their limited quantity and use them judiciously.

[CBSE Topper 2019]

