Management of natural resources

Introduction

Resources: Resources can be defined as a source of supply held in reserve, which is useful to man or can be transformed into more valuable and useful items for mankind.

Resources are of two types: Natural resources and man-made resources

Natural resources: Natural resources can be defined as those living or non-living substances available in the normal environment which are being exploited for supporting life and meeting human requirements.

Man-made resources: are those resources which are manufactured or synthesized by man, e.g. plastic, fertilizers, pesticides etc.

Classification of natural resources:

(i) Due to their large variety and variable characteristics, natural resources can be classified into two broad categories: **(a) Biotic resources (b) Abiotic resources**

- ***(a)*** **Biotic resources**: Living beings and the substances derived from them constitute the biotic resources. Animals, forests, fish and the substances derived from them such as timber and coal are examples of biotic resources.
- ***(b)*** **Abiotic resources:** Natural non-living things and their derivatives constitute the Abiotic resources. Air, water and light are its good examples.

(ii) On the basis of abundance and availability, natural resources are classified into two types: (a) Exhaustible resources (b) Inexhaustible resources

a)Exhaustible resources: Those resources which are not created regularly in the natural systems and are available in limited quantity. They are not likely to be available after being used once. Such resources are called exhaustible resources. These include minerals, fossil fuels etc.

b) Inexhaustible resources: Those resources which are created in the natural systems continuously and they are likely to be available for all times to come. Such resources are called inexhaustible resources. These include air, clay, sand, tidal energy, solar energy, rain water etc.

Q) Why do we need to manage our resources?

Ans) Natural resources are not unlimited and with the continuous increase in human population, the demands for natural resources have been increased at a tremendous rate. Modern scientific technology has helped the man to extract these resources on much larger scale. Thus natural resources requires a long term management so that these will last for generation to come and will not be merely exploited for short term gains.

The excessive use of natural resources and disturbance in the natural balance has caused ecological crises. This crisis has resulted in the environmental pollution which has threatened the life of man on earth. For example, mining causes pollution because of the large amount of slag which is discarded during extraction of metals. Thus there should be proper plan for the safe disposal of the wastes of natural resources in order to save the environment from the pollution.

Q) What is conservation?

Ans) Conservation may be defined as the judicious and controlled use of natural resources for the benefit of life on earth. It is an important precautionary measure that provides valuable contribution to the economic development of the society..

Types of conservation

There are two main types of conservation:

(i) 'In situ' conservation and (ii) 'Ex situ' conservation

(i) 'In situ' conservation: When conservation of natural resources is done in their natural habitats, it is called 'in situ' conservation e.g. national parks, wild life, sanctuaries, biosphere etc.

(ii) 'Ex situ' conservation: When conservation of natural resources is done outside their habitats, it is called 'ex situ' conservation e.g. botanical gardens, zoos, pollen storage, tissue culture etc.

Q) What do you know about Ganga Action Plan?

Ans) **Ganga Action Plan:** It was a multi crore project which started in the year 1985 to enhance the quality of the water in the river Ganga. The total coliform count was very high in the Ganga (more than 1200MPN/100ml) when the project was started. Where (MPN: Most probable number)

Q) What is Coliform?

Ans) Coliform is a group of bacteria found in human intestines, whose presence in water indicates its contamination by disease-causing micro-organisms.

Q)Write a short note on Dal lake?

Ans) Dal Lake is a famous fresh water lake of Kashmir. Its depth is near about 3 meters. It is reported that 100 years ago, its area was of 25 square kilometers which has been shrunk to 11.5 square kilometers at present. The shrinking and deterioration of this lake at a high rate is due to human greed, accelerated land use along the catchment, dumping of domestic waste, garbage and sewage and illegal encroachment etc. It is loosing its character and identity as it is rapidly becoming silted up. To conserve the Dal lake, an integrated and multidisciplinary approach is needed to save this lake from further degradation.

Q.) Explain how can we check the pH of a tap water and compare it with pH of the water in the local water?

Ans) Dip a wide range universal pH indicator paper into the tap water and note the change in its colour. Now compare the colour obtained with the standard chart provide and assign its pH. The pH of tap water is nearly neutral, i.e. 7.00. If the paper turns red, it indicates acidic nature of water and if the paper turns blue, it indicates alkaline nature. Find out the pH of polluted water and compare it with the pH of tap water. The pH of polluted water is not neutral. It is either alkaline or acidic. Change in pH is caused due to effluents entering to a water body (pond, lake, stream, etc.)

Q) What are the three R's to save natural resources?

Ans:- The above description can be concluded with three R's necessary to save environment. The three R's are: Reduce, Recycle and Reuse.

Reduce: Natural resources can be saved by their lesser use. It means, we must use every thing in less quantity to conserve the resources. We should avoid unnecessary use of electricity, wasting of food and water, cutting of trees, too much use of automobiles, etc.

Recycle: There are certain resources which can be recycled to be used again. The materials like plastic, clothes, paper and metal pieces which are not of any use at our home are recycled to make required things instead of synthesizing or extraction of fresh plastic, paper, glass or metal. It helps to reduce the production of fresh items. Thus, recycling saves resources, decreases use of toxic chemicals, cuts the use of energy and helps the environment in many ways.

Reuse: It is better than recycling because in this process we use the already used article again and again and no energy is required as compared to recycling. For example, a plastic container in which we buy various food-items like tea leaves, sweets or pickle can be reused for storing some other thing in the kitchen. For example, newspapers and magazines can be used to make envelopes.

Q) What are the international norms to regulate the emission of carbon dioxide?

Ans) The international norms to regulate the emission of carbon dioxide are:

a) **Tailpipe emission control:** These include increasing engine efficiency, increasing vehicle efficiency, increasing driving efficiency and clearing up of the emission.
b) **Evaporative emission control:** These include capturing vented vapours and reducing refueling losses.

Q) Write a short note forests?

Ans) The forest is a complex ecosystem consisting mainly of trees that have formed a buffer for the earth to protect life forms. The trees which make up the main area of the forest create a special environment, which, in turn, affects the kinds of animals and plants that can exist in the forest.

The FAO Food and Agriculture Organization has defined forest as land with tree crown cover of more than 10% and area of more than 0.5 hectare. The trees should be able to reach a minimum height of 5 m at maturity. In the tropical and subtropical region, forests are further subdivided into plantations and natural forests. Natural forests are forests composed of indigenous trees, not deliberately planted. Plantations are defined as forests established by planting/seeding in the process of afforestation or reforestation

Forests can develop wherever there is an average temperature greater than about 10° C in the warmest month and an annual rainfall in excess of about 200 mm annually. In any area having conditions above this range there exists an infinite variety of tree species grouped into a number of stable forest types that are determined by the specific conditions of the environment there. Forests can be broadly classified into many types, some of which are the Taiga type (consisting of pines, spruce, etc.) the mixed temperate forests with both coniferous and deciduous trees, the temperate forests, the sub tropical forests, the tropical forests, and the equatorial rainforests. There are about 16 major types of forests in India from the tropical type to the dry type.

In India it is believed that organized exploitation of forest wealth began with an increase in hunting. Ashoka the Great is said to have set up the first sanctuary to protect the forests and all life in it. The Mughal rulers were avid hunters and spent a great deal of time in the forests.

It was during the British rule that the first practical move towards conservation in modern times took place. They established 'Reserved Forest' blocks with hunting by permit only. Though there were other motives behind their move, it at least served the purpose of classification of and control over the forests.

Uses of forests: Forests are the most important environmental components responsible for the essence of life on earth. They produce many valuable things and maintain ecological balance of the land area. The important products we get from forests are as follows:

Wood: The wood which we get from forests is utilized almost in all the spheres of day to day life. For example, it is needed as timber, wooden crates for packing fruits, tea etc. paper board and news prints.

Industry also consumes much of wood. Wood is also used for making boats, sports goods, railway sleepers etc. In developing countries a major portion of wood is consumed as fire – wood.

Food and spices: Forests give us most of dry fruits (e.g. almond, walnut, cashew nut, coconut etc) and spices (e.g. clove cinnamon, cardamom etc).

Forests provide us Tannins, Gums, Resins and Dyes. Tannins are used in the preparation of inks and leather polish. Gums in the preparation of chewing gums and resins (such as haematoxylin and henna) are also obtained from forests.

Forests are the best producers of many drugs and medicines, e.g. quinine, aconite, belladonna etc.

The other products such as natural rubber, rudraksha, tendu leaves, cork, honey, coamphor etc are also the gifts of forests.

Q) What do you know about the stake holders? What are the major stakeholders of forests resources? Explain?

Ans) Stakeholders are the persons or the company that has invested in business and owns a part of it, or someone who has not invested in business but has an interest in the success of a system or organization.

The four stakeholders of forests are:-

1) The local people: These are the people who live in or around forests. They are dependent on forest produce for various activities of their life. They need large quantities of firewood, small timber and thatch for their living. They use bamboo or other wood sticks for making states of their huts and baskets for collecting and storing fruits, vegetable and other food materials.

2) The forests department of the government: The forest department of the government which owns the forest land and controls the forest resources.

3) The industrialists: The industrialists who use forest produce as raw materials fro their factories.

4) The nature and wildlife enthusiasts: These are the people who want to conserve nature in its pristine form. These include local people who traditionally work for conservation of forests.

Q) What do you mean by sustainability management of forests?

Ans) Sustainability management of forest resources means to manage the forests and its produce in such a way so that it will continue to benefit generations to come and will help in maintaining the biodiversity and ecological balance of the forests. Forests are rich and complex ecosystems, which support biodiversity, provide valuable ecological services and have considerable potential for tourism. In particular, millions of poor people depend on forest ecosystems for food, water, fuel, fibre and both timber and non-timber products-indeed, for their survival. To achieve sustainability, there must be a rethinking of what we consider a basic need. It is common in our society to say that we need a given resource, but how much of it do we really need to use? Also, how do we decide what the basic needs of our ecosystem and the organisms living within it are? Defining what constitutes a basic need is perhaps the greatest challenge to adopting sustainability practices in our daily lives.

Q) Write a short note on the Chipko Andolan (Hug the trees movement)?

Ans) **The 'Chipko Andolan' (Hug the trees movement'):** It was the movement which originated from an incident in a remote village called Reni in Garhwal, high-up in the Himalayas during the early 1970s. There was a dispute between the local villagers and a logging contractor who had been allowed to fell trees in a forest close to the village. The local villagers stood against the ruthless cutting of the trees. At the initial stage of the movement (in 1972), the women of Advani village in Tehri-Garhwal protested against indiscriminate felling of trees by clasping the tree trunks. In March 1973, a sports goods factory was to cut ten Ash trees near the village Mandal in Chamoli district. The local people prevented the same by hugging (Hindi Chipko) the marked trees. In 1974, a group of women led by Gaurs Devi successfully prevented felling of trees near village Reni. The movement became famous in 1978 when the women of Advani village in Tehri-Garhwal faced police firing and later courted arrest. In this way, the "Chipko Movement" spread slowly to all nearby areas under the leadership of Shri Sunderlal Bahuguna of Silyara in Tehri region and Shri Chandi Prasad Bhatt of Gopeshwar.

Q) What is Deforestation? Give its reasons?

The indiscriminate cutting or felling down of trees leads to destruction reduction or removal of forest cover, this is known as deforestation.

Reasons for deforestation:

i) **Expansion of agriculture:** The increasing demand of food has resulted in deforestation to convert forests into agricultural fields.
ii) **Firewood collection:** In rural and suburban areas firewood is the main source of fuel. To obtain firewood large numbers of trees are being felled every year resulting in the depletion of forests.
iii) **Timber harvesting:** Felling or logging of forest trees for obtaining timber is an important cause of deforestation.
iv) **Urbanization and industrialization:** Extension of urban areas and establishment of industries are the important factors causing depletion of forest resources.
v) **Cultivation on hill slopes:** Forests existing on hill slopes are gradually being destroyed, in order to use these slopes for cultivation.
vi) **Cattle ranching:** Large areas of tropical forests have been converted into grazing fields to raise cattle.
vii) **Fire:** Fire in the forests cause devastating effect on trees and wild animals.
viii) **Constructing of roads, railway tracks and mining:** are other factors responsible for deforestation:
ix) **Shifting cultivation:** In this method of cultivation (popularly known as jhoom kheti) a patch of forests is cleared, vegetation is burnt and ash is mixed with soil to increase fertility. Crop is grown there till the land is fertile, after that the cultivators move to other patch of forest. In this way forests are being destroyed.

Q) What are the consequences of deforestation?

Ans) **Consequences of deforestation:-**

i) Change in climatic conditions, like temperature, humidity, wind velocity, precipitation, etc.
ii) Soil degradation and erosion.
iii) Depletion and change in pattern of rainfall.
iv) Loss of wildlife.
v) Destruction of natural habitat and reduction in biodiversity.
vi) Increase in environmental pollution.
vii) Increase in frequency of floods and droughts.

Q) What do you mean by conservation of forests?

Ans) The development, management and full protection of existing forest cover to provide optimum sustainable yield is called as conservation of forests. For the conservation of forests, some of the important measures are suggested as:

Afforestaion: The afforestation or plantation of indigenous or exotic species to develop forests prevents denaturation of natural forests. The plants developed in all the available land of villages, fields, road sides and waste lands help the villagers, cattle and small industries to meet their basic requirements. Several forest protection committees involve villagers to follow many afforestation schemes.

Conservation of reserve forests: Many areas of natural forests are protected from fuel-starved villagers, fodder starved cattle and commercial exploitations. These areas include national parks, sanctuaries, sacred graves, biosphere reserves etc. Such forests are not allowed to be disturbed.

Social forestry: It is described as "forestry from the people, by the people and for the people." It includes raising of trees on government owned lands for obtaining food, fodder, wood, fruits, etc.

Social forestry was started in India by National Commission of Agriculture (NCA) in 1976 to reduce pressure on real forests.

Agro forestry: It is a type of afforestation where multipurpose trees, shrubs, horticultural plants and forage plants are grown in fields along with crops. It fulfils the requirement of fodder, fruits, flowers, fuel wood and timber. Agro forestry also reduces pressure on real forests.

Urban forestry: It is a special type of afforestation of multipurpose trees, shrubs and flower or fruit bearing plants in open lands of urban areas. It helps to check air pollution and reduce noise pollution. It is also helpful in providing fuel, wood, timber, fruits and many other products.

Q) What is Wildlife? What is its importance?

All the naturally occurring life forms in the forest, which are neither domesticated nor tamed, are collectively called wildlife. The term wildlife was coined by William Hornady in 1913. The wildlife has a great importance in maintaining the ecological balance of forests.

Importance of wildlife:

i) The wildlife can be used commercially to earn money through tourism.
ii) The wildlife provides best means of sports and recreation.
iii) The wildlife is responsible for maintaining the natural balance of the environment.
iv) The wild plants act as producers on which thrives the herbivorous animals upon whom depends the carnivorous ones.
v) The wildlife is deeply related to literature, religion, art, sculpture and culture.
vi) Study of wildlife helps naturalists to study living organisms in their natural habitat.
vii) Wildlife is considered as gene bank, which can be used for producing high yielding plants and animals through the process of selection and hybridization.
viii) Wildlife is a symbol of national pride and represents the cultural heritage.
ix) Since wildlife is a renewable source of large variety of commercial products, like food, fur, lac, musk, leather, ivory, timber, fibre, fodder, fuel, medicines, etc it can be used time and again.

Q) What are the various threats to wildlife?

Ans) The various threats to wildlife are: hunting, destruction of habitats, overgrazing by domestic animals, endangered flora and fauna and economic consideration of some animals as they are always in great demand for their highly priced articles like skin, wool fur, horn, musk, ivory etc.

Q) What are endangered species? Give some examples of endangered plant and animal species?

Ans) All those species of plants (flora) and animal (fauna) which are liable to become extinct are called endangered species.

Examples of some endangered plant species:

Nepenthes Khasiana (pitcher plant)
Snow orchid
Drosera indica (insectivores plant)
Aldsovanda vesiculosa
Rhus hookeri

Examples of some endangered animal species:

Indian wild ass
Great Indian rhinoceros
Indian wolf
Lion tailed macaque
Tillyards dragonfly

Q) What do you know about wildlife conservation?

Ans) Wildlife conservation is the management of wild flora and fauna in order to save them from their extinction as well as to get sustainable benefit for both the present and the future generations. Various governmental organizations and NGO's have been set up to protect the wildlife. These organizations mainly focus at:

(i) Protection of natural habitat:
(ii) Maintenance of wildlife in protected areas (reserves)
(iii) Protection through legislation

(i) Protection of natural habitats: Natural habitats of animals must be protected by identification and safeguard of feeding, resting, breading and nursing habitats of each species.

(ii) Maintenance of wildlife in protected areas: The wildlife can be protected and maintained in protected areas such as in biosphere reserves, national parks and in sanctuaries.

(iii) Protection through legislation: In India, several laws and acts have passed from time to time in order to protect the dwindling wildlife. Out of all, the wildlife (protection) act, 1972 is treated as the most effective. Under this act, possession, trapping, shooting of wild animals alive or dead, serving their meat in eating houses, their transport etc are completely under strict control. There are some laws and acts of wildlife conservation which are made by state as well as union government. Among those some are mentioned below:

i) CITES - Convention on International Trade in Endangered Species: It regulates international trade of wild flora and faun (1976)
ii) IBWL – Indian Board of Wild Life (1952)
iii) MAB – The Man and Biosphere program of UNESCO: It was started in 1971 for studying biosphere reserves.
iv) The preservation of trees act, introduced in 1975 to protect and regulate felling of trees and to provide space for planting of new trees in those areas. The act was emended in 1996.

v) Special projects for endangered species: Project Tiger (1973), Gir Lion Project (1972), Crocodile Breeding Project (1974) etc.

Q) Write a short note on River Jhelum?

Ans) River Jhelum is one of the famous rivers of Kashmir which has its origin from a beautiful spring called "Chashma Verinag". Verinag is situated at the foot hills of the Pir Panchal Range of Anantnag district (south-eastern part of Kashmir). In Kashmir, it starts from the northern slope of the Pir Panchal Range through the vale of Kashmir to Wullar Lake, which controls its flow. Emerging from the lake, the Jhelum crosses the Pir Panjal in a gorge 7,000 feet (2,100 meters) deep with almost perpendicular sides and reaches Muzaffarabad. At Muzaffarabad, the administrative centre of Pakistan-administered sector of Kashmir, the Jhelum receives the Kishanganga River and then bends southward, forming part of the border between Muzaffarabad and North-West Frontier Province of Pakistan. Then river flows southward into Punjab Province. Near Mangla the Jhelum breaks through the outer Himalayas into broad alluvial plains. At Jhelum town the river turns southwestward, where it again bends south to join the Chenab River near Trimmu. The total length of the Jhelum is about 450 miles (725kms). With the increase in population, there is gradual encroachment of the river banks. This pity river is getting silted up due to eroding of its catchments particularly the low hills. This siltation is attributed to the development of hill roads, highways, urbanization, quarrying, mining etc. The entire sewage of the valley enters the Jhelum untreatedly. The continuous increase of water pollution and use of unlimited agrochemicals in the state resulted the loss of biodiversity of the Jhelum River. The fish fauna (Schizothorax) of this river has been reported to be disappearing at several locations of the entire stretch of this river.

Q) What changes would you suggest for water harvesting designs for rainfall areas in J&K State?

Ans) We suggest the following designs which depends on the soil, topography, size of the land holding etc.

a) Contour cultivation: Contour cultivation would form barriers across the flow path of runoff water. It is most effective on moderate slopes. The water is collected in the depressions.

b) Contour bunding: The construction of narrow based bunds on contour to impound runoff water behind them, so the impounded water is absorbed gradually into the soil profile. The bunds are normally impounded upto a height of 30cms. The bunds should be constructed from the top of the catchment and preceded downwards.

c) Bench terracing: It involves converting the original ground into level step like fields constructed by half cutting and half filling, which reduces the degree of slope. It is practiced on steep hilly slopes where agriculture practices are common.

d) Strip farming: It is method of farming when a slope is too steep or too long. Strip farming helps to stop soil erosion by creating natural dams for water, helping to pressure the strength of the soil. The principle lying behind this process is to collect runoff water from catchment area to improve soil moisture on the cropped area.

e) Storing runoff water for recycling: In semi-arid areas, summer rainfall is short in duration and the intensity of rainfall is high which gives high runoff. This is because high intensity of rainfall has low infiltration rate and runoff rate is therefore, very high. Therefore, catchment area, which has low-lying region, is selected and bunded for collection of runoff water.

f) Check dams construction on Nallas and off-stream: It is a process in which construction of bunds of suitable dimensions across Nalla or stream is carried out to hold maximum runoff water and to create temporary flooding in the stream with arrangements to drain water at suitable intervals. The water released from bunds will be free from silts and will have suitable velocity, which is unable to cause erosion.

Q) What do you mean by rain water harvesting?

Ans) Rain water harvesting is a very popular method of conserving water especially in the urban areas. Rainwater harvesting essentially means collecting rainwater on the roofs of building and storing it underground for later use. This helping in recharging, arrest groundwater depletion, and raises the declining water table. Rainwater harvesting and artificial recharging are becoming very important issues. It is essential to stop the decline in groundwater levels, arrest seawater ingress, i.e. prevent seawater from moving landward, and conserve surface water run-off during the rainy season.

Town planners and civic authority in many cities in India are introducing bylaws making rainwater harvesting compulsory in all new structures. No water or sewage connection would be given if a new building did not have provisions for rainwater harvesting. Realizing the importance of recharging groundwater, the CGWB (Central Ground Water Board) is taking steps to encourage it through rainwater

harvesting in the capital and elsewhere. A number of government buildings have been asked to go in for water harvesting in Delhi and other cities of India.

Q) What are Kulhs and Khadins?

Ans) **Kulhs:** These were local systems of canal irrigation consisting of man-made canals through which the water flowing in the streams was carried to numerous villages down the hills side. These were built in parts of Himachal Pradesh nearly four hundred years ago. The entire system was managed by two or three people appointed and paid by the villagers. There was a common agreement among all the villagers that the village lying farthest away will get water first and then the villages progressively higher up. This system was functioning very well and villagers were happy to have irrigation water during the planting season. Moreover, the water from these Kulhs also percolated into the soil to enrich the springs. Then the Kulhs were taken over by the irrigation department and most of them became defunct.

Khadins: These are traditional rainwater harvesting systems for agriculture in Rajisthan. These consist of a very long (100 – 300 m long) earthen embankment built across the lower edge of the sloping farm land. The area enclosed by embankment is called 'bund', which collected a huge amount of rainwater that flows down the slopes. The overflowing water across the bund is carried through pathways specially made for this purpose and fills the shallow wells dug behind the bund. The collected rain-water gradually seeps into deeper layers.

Q) What are dams? Give some examples of few important dams in India?

Ans) Dams are the large water-storing bodies usually built by the government agencies across the rivers to regulate the flow of water. They store enormous amount of water sufficient for irrigation of fields throughout the year. Many dams have been constructed across the major rivers in India which serve as big store houses of river water. The stored water is then allowed to flow downstream in order to generate electricity and carry water to long distances for the purpose of irrigation. Thus, dams not only help in the irrigation of agricultural fields, but also employed for generation of electricity. Some example of famous dams and canals in India are:

1) **Bhakra dam:** It is built across the river Satluj in the state of Punjab.
2) **Sardar Sarovar dam:** It is built on the river Narmada in 1940 in the state of Gujrat.
3) **Tehri dam:** It is situated on the river Ganga in Tehri. (Uttaranchal)
4) **Tawa dam:** It is a large reservoir on the Tawa river located in Hoshangabad (M.P)
5) **Mettur dam:** It is situated on river Kaveri in Tamilnadu and is one of the oldest dams in India.
6) **Indira Gandhi canal:** It is spread over a large area of Rajasthan. It has brought greenery in deserts.

Q) What are the various uses of dams?

Ans) The various uses of dams are as follows:

1) Large dams store adequate amount of water which is used for irrigation in fields through a canal system. The canal systems originating from dams can transfer large amounts of water to great distances which helps to raise agricultural production in far away places. e.g. Indira Gandhi Canal originating from Bhakra dam has brought greenery in deserts of Rajasthan.
2) Dams ensure continuous water supply in the surrounding area. It is also used to supply water in towns and cities through pipe lines.
3) The water of dams flowing from a height is used for generating electricity.

Q) Discuss the problems associated with the construction of large dams?

Ans) The problems associated with the construction of large dams can be categorized into following categories:

1) **Social problems:** Construction of high-rise dams results in a vast area of land submerged under water. Many people residing in the area are rendered homeless. This creates displacement of a large number of peasants and tribes without adequate compensation or rehabilitation. These social problems result in protests like "Narmada Bachao Andholan" ('Save the Narmada Movement'). The people who have been displaced by the construction of Tawa Dam in the 1970s are still fighting for the benefits they were promised.
2) **Economic problems:** Construction of high-rise dams swallow up huge amounts of public money without the generation of proportionate benefits.
3) **Environmental problems:** The construction of dams also contributes enormously to deforestation, loss of biodiversity and displacement of poor tribals. Large reservoirs of water formed by the dams destroy flora and fauna of the area which get submerged under water.

Q) What is Coal? How it is formed?

Ans) Coal is by far the most abundant fossil fuel on earth. It is essentially carbon and is mainly used as a combustion fuel. The large-scale use of coal began with the Industrial Revolution in the 19th century. As the number of industries increased, demand for more sources of energy grew.

Formation of coal

Coal is the product of plants, mainly trees that died millions of years ago. Due to water logging in low-lying swampy areas or in slowly sinking lagoons, dead trees and plants did not decompose as they normally would. The dead plant matter was covered with water and protected from the oxidizing effect of air. The action of certain bacteria released the oxygen and hydrogen, making the residue richer and richer in carbon. Thick layers of this carbon-rich substance, called peat, built up over thousands of years. As more material accumulated above the peat, the water was squeezed out leaving just carbon-rich plant remains. The pressure and temperature further compressed the material. This aided the process of producing coal. With the passage of time more gases were forced out and the proportion of carbon continued to increase. Finally the carbon slowly metamorphosed into coal over millions of years.

Q) Write a short note on petroleum?

Ans) Petroleum is found in porous rock formations in the upper strata of some areas of the Earth's crust. Known reserves of petroleum are typically estimated at around 1.2 trillion barrels with at least one estimate as high as 3.74 trillion barrels. Consumption is currently around 84 million barrels per day, or 31 billion barrels per year. Because of some engineering difficulties, recoverable oil reserves are significantly less than total oil-in-place. It is estimated that current consumption levels, the known reserves would last for about 32 years, around 2039.

Textual & some important additional questions

Q.1) What changes would you suggest in your home in order to be environment-friendly?

Ans) I will suggest the following changes in my home in order to be environment-friendly:

(a) to save energy turn off lights when not in use.
(b) use kitchen wastes as manure.
(c) use drip irrigation for watering the plants.
(d) use cloth bags in place of polythene and plastic bags.

Q.2) Can you suggest some changes in your school, which would make it environment friendly?

Ans) I will suggest the school authority to adopt these environment-friendly measures:

(a) grow big trees along the boundary wall.
(b) grow shrubs and hedge on the sides of internal road and around playground.
(c) harvest water from rooftop to be utilized for watering the plants.
(d) arrange awareness programmes among students through poster exhibition and popular lectures.

Q.3) 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?

Ans):- As an individual I can contribute to conserve these natural resources in the following ways:

(a) Forests and Wildlife

i) Educating the people about the importance of forest.
ii) Using less forest products and avoid wasting forest resources.
iii) Changing our life style and adapting eco-friendly methods.
iv) Avoid hunting

(b) Water Resources

i) Usage of recycled water for gardens.
ii) Avoid using water directly from tap; instead collect water in containers and use for various purposes.
iii) Create awareness about rainwater harvesting.

(c) Coal and Petroleum

i) Taking a bus, rather than using our personal vehicle.
ii) If the distance for traveling is short walking will be better option rather than taking a vehicle.
iii) Be conservative while using LPG at homes.

Q.4) What can you as an individual do to reduce your consumption of the various natural resources?

Ans):- (a) I will use public transport system to move instead of individual vehicle.
(b) I will use solar cooker to conserve fossil fuel.

(c) Instead of lift I will prefer to move through stairs.
(d) I will use fluorescent tubes in my home to conserve electrical energy.
(e) I will prefer to use renewable source of energy.

Q.5) On the basis of the issues raised in this chapter, what changes would you incorporate in your life-style in a move towards a sustainable use of our resources?

Ans) (a) I will move in public transport system to conserve petrol.
(b) Instead of coal or natural gas I will prefer to use solar energy for cooking.
(c) I will obey rationalized husbanding of all renewable resources.
(d) I will adopt willingly sustainability as a way of life.
(e) I will advice controlled extraction of forest wealth.

Q.6) What would be the advantages of exploiting resources with short-term aims?

Ans) Exploitation of resources for short-term aims will be more advantageous than long term needs because only fewer amounts will be exploited while the remaining resource will be retained for future generation. It also beneficial to meet the immediate basic human needs.

Q.7) How would these advantages differ from the advantages of using a long-term perspective in managing our resources?

Ans):- Short term exploitation of natural resources is to meet the current demand. It is beneficial for the present generation only whereas, management of resources with long term perspective is aimed to fulfill the needs of future generations. Long term use of resources can be achieved through its sustainable use.

Q.8) Why do you think there should be equitable distribution of resources? What forces would be working against an equitable distribution of our resources?

Ans):- Equitable distribution of resources will ensure will ensure benefits to all the sections of people, rich as well as poor, which is necessary for the growth and development of a country. Money force is the main factor working against an equitable distribution of resources as rich people and rich nations try to encroach upon the resources share of the poor people or poor nation.

Q.9 Why should we conserve forests and wildlife?

Ans):- (a) They maintain the ecological balance of the environment.
(b) They are our gene bank, from where we can harvest useful genes to develop high yielding plants and animals.
(c) They have aesthetic, religious, culture, sculptural and artistic values.
(d) They are a source of tourism, trade and commerce.
(e) Wildlife is useful for performing scientific research.

Q.10) What are the conditions essential for a forest to thrive?

Ans) Forests can develop wherever there is an average temperature greater than about 10° C in the warmest month and an annual rainfall in excess of about 200 mm annually. In any area having conditions above this range there exists an infinite variety of tree species grouped into a number of stable forest types that are determined by the specific conditions of the environment in that place.

Q.11) Classify the forest based on the type of trees?

Ans) Based on the type of trees forests can be broadly classified into many types, some of which are:-
The Taiga type (consisting of pines, spruce, etc.)
The mixed temperate forests with both coniferous and deciduous trees,
the temperate forests,
the sub tropical forests, the tropical forests, and the equatorial rainforests.

Q.12) How do we get water and how it can be sustained?

Ans) The only natural input to any surface water system is precipitation within its watershed. The total quantity of water in a system at any given time is also dependent on many other factors. These factors include storage capacity in lakes, wetlands and artificial reservoirs, the permeability of the soil beneath these storage bodies, the runoff characteristics of the land in the watershed, the timing of the precipitation and local evaporation rates. All of these factors also affect the proportions of water lost through discharge to the oceans, evaporation and sub-surface seepage.

Q.13) What is watershed development?

Ans) The watershed is the basin of a tributary. It may have a small stream or it may not have any such stream, whenever it rains, the water flows through it finally to join some stream. The watershed thus is a physiographic unit and can be used conveniently for irrigated development of small natural unit areas. The watershed development is a holistic approach. It includes programs for soil and moisture

conservation, water harvesting, afforestation, horticulture, pasture development and upgradation of community land resources. These plans take into consideration the land capability and the local needs of the people. It seeks participation of the local people.

Q.14) What is rainwater harvesting?

Ans) It is the technique of capturing and storing rain water into dug wells, check dams and percolation pits in order to increase the recharge of ground water. Rain water is stored in ground water reservoirs by adopting artificial recharge techniques in order to meet the household needs through storage in tanks. Two techniques involved are:

(i) Rooftop harvesting (ii) Check dam and percolating pits

(i) **Rooftop Harvesting:** This involves collecting rainwater from rooftops of the house and other buildings and storing the water in tanks, trench, percolation pits or underground reservoirs. This water is then used for growing vegetation, cultivation of crops, gardening etc.

(ii) **Check dam and percolating pits:** Water is stored in natural depression on the surface of the earth. Inexpensive barriers are constructed to prevent run off. The water stored in the check dams is used for irrigation during dry season. This scheme has been undertaken with successful results in many parts of western U.P, Punjab and Haryana.

The objectives of rainwater harvesting are:

a) To meet the increasing demand of water.
b) To reduce the wastage of rainwater which drains of the ground into the rivers, oceans and seas.
c) To avoid flooding of roads and fields.
d) To raise the level of the water table.
e) To reduce ground water pollution.
f) To meet the water requirement during summer and long dry spells.

Q.15) Name National Parks of the state of Jammu & Kashmir?

Ans) The National Parks of the Jammu & Kashmir are:

i) Dachigam National Park
ii) Hemis High Altitude Park (Leh)
iii) High Altitude National Park (Kishtawar)

Q.16) What do you know about ADBN award for Wildlife Conservation?

Ans) "Amrita Devi Bishnoi National Award for wildlife conservation" is the award instituted by government of India in the memory of Amrita Devi Bishnoi, who in 1931 sacrified her life along with 363 others for the protection of 'Khejri' trees in Khejrali village near Jodhpur in Rajisthan.

Q.17) What are the environmental laws of India?

Ans:- Environmental laws of India: The environment and conservation laws in India have been framed and enforced in phases, according to the needs that arose from time to time.

Some of the environmental laws formed by government during pre and post independence period are as below:-

- Madras Wild Elephant Preservation Act, 1873 – it is supposed to be the earliest preservation law of India.
- Elephant Preservation Act, 1879.
- Bengal Rhinoceros Preservation Act, 1932.
- Assam Rhinoceros Protection Act, 1954.
- The Bengal Smoke Nuisance Act, 1905 (amended in 1973)
- The Mines and Minerals (regulation and development)Act, 1947
- The Insecticides Act, 1968
- The water (preservation and control of pollution) Act, 1974 (amended in 1988)
- The Air (prevention and control of pollution) Act, 1981 (amended in 1988)
- Forest Conservation Act, 1980 amended in 1988).
- Environment protection Act, 1986.
- Wildlife (protection) Act, 1972 (amended in 1991).
- Public Liability insurance Act, 1991.

Q.18) List five main reasons for the depletion of wildlife.

Ans:- The reasons for the depletion of wildlife are as follows:-

a) Deforestation for various reasons like urbanization, cultivation, dam building, establishment of industries, etc.
b) Indiscriminate hunting by man for meat, skin and for sports.

c) Natural calamities like flood, drought, fire, epidemic, etc have played a major role in depletion of wildlife.
d) Decrease in shelter or hiding places for animals.
e) Noise pollution by transport vehicles and nearby industries and also air pollution and water pollution have played their role in depletion of wildlife.

Q.19) Write a note on renewable and non-renewable resources?

Renewable resources: Those resources that are or can be created regularly are called renewable resources. Most of the biotic resources such as forest resources are renewable. The renewable resources can be exhaustible if the rate of their exploitation is higher than the rate of natural accrual. For example the forests and fish resources, though both renewable, are exhaustible if the rate of exploitation is too high. However, some of the renewable resources are inexhaustible also as their supply is very large, for example the solar energy and wind energy.

Non-renewable resources: Those resources that cannot be created once they are used, are called the non-renewable resources. Most of the exhaustible resources such as minerals and fossil fuels (coals, natural gas and petroleum) are non-renewable resources.

Multiple choice questions

1. MAB stands for
a) man and biology programme. b) man and biosphere programme.
c) mammal and biology programme. d) mammal and biosphere programme.
2. Project tiger, in India was started in the year
a) 1973 b) 1981
c) 1985 d) 1988
3. Deforestation causes
a) thermal pollution b) soil erosion
c) noise pollution d) all of these
4. The role of forest is
a) productive b) protective
c) regulative d) all of these
5. Read data book, is produced by
a) IBWL b) ZSI
c) WWF d) IUCN
6. Conservation is
a) proper use of natural resources b) protection of natural resources
c) management of natural resources d) all of these
7. Which of the following animal has become extinct in India?
a) tiger b) rhinoceros
c) cheetah d) lion
8. Chipko movement, originated in
a) Panchmari in Madhya Pradesh b) Silent valley of Kerala
c) Kaziranga in Assam d) Tehri Garhwal in Uttaranchal
9. Wildlife protection Act was enacted by the government of India in
a) 1952 b) 1972
c) 1958 d) 1973
10. Deforestation causes
a) loss of wildlife b) soil degradation and erosion
c) increase in environmental pollution d) all of these

Answers of Multiple Type Question

1. (b)	**2. (a)**	**3. (b)**	**4. (d)**	**5. (d)**
6. (d)	**7. (c)**	**8. (d)**	**9.(b)**	**10. (d)**