Natural Resources:

Anything in the environment 'which can be used' is called 'natural resource'. Natural resources include total natural environment that support human life and contribute to the production of necessities and comforts to mankind. So natural resources are the components of atmosphere, hydrosphere and lithosphere.

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

(a) Inexhaustible. These are in plenty and cannot be exhausted by man's consumption e.g., air, sand, clay etc, affected by over-population of mankind.
(b) Exhaustible. These are limited and can get exhausted over a period of time. i.e., coal, petroleum etc.

Management of Natural Resources

A system of controlling the use of natural resources in such a way as to avoid their wastage and to use them in the most effective way is called management of natural resources.

Why do we Need to Manage Our Resources:

We need to manage our natural resources because of the following reasons:

1. The resources of the earth are limited. Because of the rapid increase in human population, the demand for resources is increasing day by day. The proper management can ensure that the natural resources are used judiciously so that they fulfill the needs of present generation and also last for the generations to come.

2. The proper management of natural resources takes into consideration long-term perspective (or view) and prevents their exploitation to hilt for short-term gains.

3. The proper management can ensure equitable distribution of natural resources so that all the people can benefit from the development of these resources.

4. The proper management will take into consideration the damage caused to the environment during the 'extraction' or 'use' of the natural resources and find ways and means to minimize this damage.

Conservation of Wildlife

It is very important to conserve wild-life to maintain the ecological balance in nature and to preserve the gene pool. Some of the measures (or steps) to be taken for the conservation of wildlife are given below:

1. Laws should be made to impose a total ban on the poaching (killing) or capturing of any animal or bird belonging to an endangered species. The poaching of an endangered species of animals and birds should be made a punishable offence. Such laws should not remain on paper only, they should be enforced strictly.

2. The natural habitats of wild animals and birds should be preserved by establishing National Parks and anctuaries throughout the country.

3. The government Department connected with the conservation of wildlife should conduct a periodic survey in all the forests, National parks and Sanctuaries to have knowledge of the population of all species of wild animals

and birds, so that these animals can be helped in the times of distress like floods and famines.

4. Special attention should be paid to the conservation of endangered species of wild animals and birds to prevent their extinction altogether.

5. The unauthorized felling (cutting) of forest trees for timber trade and fuel-wood should be curbed (stopped) immediately. This is because depletion of forests destroys the natural habitat of wild animals and birds, and exposed them to he cruelty of man as well as nature.

6. In the case of Government authorized felling of forest trees, for every acre of forest cut down, an equal area of land should be planted with saplings of trees to make up for the loss in the long run.

Advantages of Dams:

1. Water from a dam is used for irrigation in fields through a network of canals. Dams ensure round the year water supply to the crop fields and help raise agricultural production.

2. Water from a dam is supplied to the people in towns and cities through pipelines after suitable treatment. In this way, construction of dams ensures continuous water supply in the region.

3. The falling water (or flowing water) from the dam is used for generating electricity. The water rushing down the dam turns turbines which run electric generators.

Disadvantages of Dams:-

1. Social problems. Due to the construction of high-rise dams, a large number of human settlements (or villages) are submerged in the water of large reservoir formed by the dam and many people are rendered homeless. This creates a social problem.

2. Environmental Problems. The construction of high –rise dams on the rivers contributes to deforestation and loss of biodiversity. This is because a vast variety of flora and fauna (plants and animals) get submerged in the water of large reservoir formed by the dam and disturb the ecological balance.

3. Economic Problems. Some people say that the construction of high-rise dams involves the spending of huge amount of public money without the generation of proportionate benefits.

Forests:-

Forests are important renewable natural resources dominated mainly by trees forming a sort of canopy they are essential for ecological balance of all ecosystems. They maintain biological diversity, prevent floods and safeguard future of tribals.
The forests, cover a wide range of life forms including bacteria, fungi, ferns, gymnosperms, flowering plants, nematodes, insects, birds, reptiles and mammals. They need conservation in order to preserve the biodiversity we have inherited. Various studies have shown that a loss of diversity may lead to a loss of ecological stability.

Conservation of Forests:

Conservation is protection, augmentation and scientific management of resources so as to maintain them at their optimum level providing benefit to the present as well as future generations. Forests and regulative properties. It is carried out by the following methods.

1. Afforestation. It is growing of forests on unprotected barren lands. Van Mahotsava is a tree plantation movement carried out twice a year (February and July) by both government and voluntary agencies.

2. Reforestation. It is developing forest cover in the area which has been damaged or cleared during exploitation.

3. Separation Separation of Commercial Forestry. of Commercial Forestry. Useful plants required by industry should be planted separately preferably on waste land. Growing industry required plants is called production plantation.

4. Grazing. Grazing should be regulated according to the availability of pasturage.

5. Sustained Yield Block Cutting. A forest is divided into a number of blocks depending upon the period required by forest trees to mature. In one year trees of one block are felled. The block is reforested immediately. In this way annual deforestation is compensated by annual reforestation. The forest is conserved indefinitely and provides sustained yield.

Effects of Deforestation:-

Removal, decrease or deterioration of the forest cover of an area is called deforestation. It ois caused buy excessive felling of trees, overgrazing, monoculture, fragmentation and clearing of forests.

Deforestation causes.

1. Soil Erosion. Removal of plant cover exposes the fertile soil to wind and water. Te latter remove the top soil and make the area infertile.

2. Desertification. Removal of forest cover in the plains makes the area dry. In hot season, the soil becomes loose. Air currents take away the fine soil particles leaving behind sand.

3. Floods. In rainy season many temporary rivulets are formed due to loss of absorption capacity by unprotected soil. The rivulets produce floods in low land causing loss to agriculture, property and life.
4. Destruction of wildlife. Deforestation leads to destruction of natural habitats of wild animals and plants. Wildlife is, therefore, destroyed.

5. Climatic changes. In the absence of forest cover, the summer becomes hotter while the winters become extra cool. The frequency of rainfall decreases.

Chipko Movement:-

Chipko-Movement was born in Nineteen seventees in a small hilly village of the upper reaches of Himalayas. Tribal people of Tehri-Garhwal district of U.P realized the importance of the forests and decided against giving its products to the people of other areas. They stood against the ruthless butchery of nature and the axes of greedy contractors. At the initial stage of the movement (in December,1972), the women of Advani village in Tehri-Garhwal protested against indiscriminate felling ot trees.

In March 1973, a sports goods factory was to cut ten ash tress near the village Mandal in Chamoli district. The local people prevented the same by hugging (vern. Hindi Chipko) the marked trees. In 1974, a group of women led by Gaura 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 policed firing and later courted arrest. The chipko Movement spread slowly to all nearby areas under the leadership of shri Sunderlal Bahuguna of Silyara in Tehri region and Shir Chandi Prasad Bhatt of Gopeshwar. Sunderlal
Bahugna is now a world famous figure; he presented his plan of this movement at the UNEP meeting held in London in June 1982.
Thus, Chipko Movement (i.e., chipko Andolan) is the tree hugging movement in which the villagers compel the axeman to stop tree felling by embracing and forming ring(circle) around the marked trees.

Watershed Management:-

Watershed is a high raised area which is source of run off to low lying areas. Growing more trees in watershed areas increases retention of more rain water and protection of soil from erosion. Therefore, watershed management develops the primary resources of land and water. It enhances the evelopment of secondary resources of plants, animals and other biota. The enhanced productivity increases the income of watershed community. There are fewer droughts and floods downstream. Silting of downstream dams and reservoirs is also reduced.

Rainwater Harvesting:-

Water harvesting is capturing, collection and storage of rain water and surface run off for filling either small water bodies or recharging ground water so that water continues to be available in non-rainy seasons.

Water harvesting designs for rain - fed areas in J&K State: Various designs have been recommended depending on the soil, topography climate, size of the land holding, etc. which could be practiced:

1. Contour cultivation. Contours are made across the slope and in this cultivation of crops, trees etc is carried out. These contours would form barriers across the flow path of runoff. It is the most effective on moderate slopes. The water is collected in the depressions.

2. Contor Vunding. Contor Vunding... It is the most popular method practiced on large scale. The practice comprises of constructing narrow based bunds on contour to impound runoff water behind them, so that impounded water is absorbed gradually into the soil profile. The bunds are normally impouned up to a height of 30 cms. The bunds should be constructed from the top of the catchment and preceded downwards.

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

4. Strip farming. Strip farming. The cropping is usually intermittent on strips or in rows with catchment area left fallow. The principle lying behind this process is to collect runoff from catchment area to improve soil moisture on the cropped area.

5. Storing Runoff Water for Recycling. In semi-arid areas, summer rainfall is short in duration and comprises of limited rainy days. The intensity or 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.

6. Chek Dams Construction on Nallas and Off- Chek Dams Construction on Nallas and Off---Stream. It is a process in which construction of bunds of suitable dimensions across Nalla or stream to hold maximum runoff water to create temporary flooding in the streams with arrangements to drain water at suitable intervals is carried out. The water released from bunds.

Coal and Petroleum Conservation:- Coal and petroleum are fossil fuels found in earth's crust. They are non-renewable and exhaustible resources.

1. Coal. Coal is combustible fossilized rock derived from a large accumulation of plant remains that is gradually compressed. About 6000 billion tons of coal lies under the earth and by now more than 200 billion tons had been used. it occurs widespread in many countries including Japan, China, Russia, U.K., U.S.A., Poland,Kuwait , Saudi Arabia, Iran, Iraq, Nigeria, Libya, Indonesia and India. Coal is used for cooking, heating, in industry and thermal power plants.

2. Petroleum. Petroleum is another fossil fuel that occurs in the form of liquid –oil. It has been formed in the past

(about 10 to 20 crore years old) from plant and animal remains and occur in the form of mineral oil in sedimentary rocks. Petroleum reserves are confined to a few countries.
In India, oil bearing area is estimated to be over a million square km/ petroleum is mainly used as fuel for transport, agricultural operations, generators and some industries.

Methods of Conservation of fossil fuels:

1. Burning of coal causes air pollution. Thus m direct use of coal for the purpose or burning should be avoided. Coal may be converted into liquid fuel and compressed natural gas (CNG) through coal gasification.

2. Techniques should be developed to recover maximum fossil fuel that lies in deep mines and wells. Wastage during extraction and transportation should be avoided.

3. Both oil wells and coal mines a prone to catch fires. Therefore, these should be well protected from fire to avoid wastage pollution and loss of life and property.

4. Over-consumption of oil in automobiles should be checked. We must save oil for future use because only a few years are left for its depletion.

5. Alternative sources of energy, such as hydroelectric, nuclear, solar, wind power and biogas plans should encouraged

Some Important Terms

National Park:-
A national park is a large area where one or several ecosystems exist and where plant and animal species, geomor phological sites and habitats are of special educating and recreative interest.

Sanctuary:- Wildlife sanctuary is a large area dedicated to protect wildlife and conserve species. Hunting is not allowed in a sanctuary.

Endangered species: -All those species of plants and animals which are liable to become extinct are called endangered species. E.g., snow orchid, Rhus hoolari, Indain wolf, Assam rabbit.

Vulnerable species:- Are those species that are vulnerable to get extincted. These are few in number and are in danger of becoming extinct. These are protected under law.

Rare species:- Rare species are those species that are threatened of extinction. Their numbers are few or they live in such small area or in such unusual environment s that they could quickly disappear.

Extinct species : Species that have no living members are said to be extinct. Extinct species are known through the fossil record. e.g., dinosaurs, mammoth, sabertooth etc.

Khadins:- khandins are earthern embankments down the slope of catchment areas which help in retaining run off water. A dug well is often located behind that embankment to store extra run off if it happens to overflow the embankment. Slowly the stored water perlocates down into the ground.

Abbreviations:-

UNEP : Unite nation's environment programme.
IPCC : Intergovernmental panel on climatic change.
GAP : Ganga action plan.
RS :Reduce, recycle, re-use.
BOD : Biochemical oxygen demand.