

Depletion of Natural Resources in India and Conservation-A View

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ABSTRACT

Man lives in nature and depends on the resources of nature. The sustenance and welfare of mankind depend upon the exploitation of different natural resources. The utilization of soil, water minerals, coal, electricity, oil, gas and nuclear energy is very important for the development of nation these resources have changed the level of living standard of man. One of the most serious aspects of the problem arises from the impact of economic efforts of mankind especially for the purpose of maintaining its existence, protection, survival and betterment of the standard of living. The basic needs which induced the human beings to spoil the natural resources for their welfare have finally led to a situation which threatens to be disastrous. There has been a tremendous increase in India's population and it has now crossed 103 crores (1.03 billion). The national commission on agriculture is giving serious thought to the problem of deforestation and has recommended introduction of "social forestry", i.e., to create multipurpose village wood lots in rural India.

Key Words: Afforestation, Joint Forest Management (JFM)

1. INTRODUCTION

All the materials and energy essential for the survival and welfare of living beings including humans are provided by nature. They are called natural resources. A thing becomes resource only when it is used by humans to perform a function. Man lives in nature and depends on the resources of nature. The sustenance and welfare of mankind depend upon the exploitation of different natural resources. The utilization of soil, water minerals, coal, electricity, oil, gas and nuclear energy is very important for the development of nation. Of the world's total population of six billion, one billion in U.S.A. and Europe alone use 84% of world's total energy. Three billion people of India, China, Brazil and few other countries use only 15%. India contains the world's second largest resource of coal and third and fourth largest resource of manganese and iron. Fossil fuels (coal, petrol, and natural gas) on which modern industrial centers are based are limited. At present rate of consumption, the fossil may be drastically depleted leading to severe energy crisis. Coal reserves of the world are higher than petroleum and natural gas and they may last longer. The leading coal producing countries are China, U.S.A., U.S.S.R., Germany, U.K., Japan, India, Poland, France and Czechoslovakia. The major oil producing countries are U.S.A., U.S.S.R., Kuwait, Saudi Arabia, Iran, Iraq, Nigeria, Libya, Arab Republic and Indonesia. New discovery of oil has been made recently in the sea beds of Mumbai.

INDIAN PERSPECTIVE

India is facing an ecological crisis and is degrading her natural resources day by day. Now the shortage of natural resources is a matter of international concern. There is increasing deficiency of energy, metals, coal, and non-fuel and non-metallic materials. With regard to fuels there is great concern over the huge outflow of foreign exchange and every year enough oil is purchased from the Middle-East countries which are major sources of petroleum. The developed nations of the world have created abundant resources but the developing nations are importing many of these from foreign countries. Due to its unending greed, man has destroyed the nature to the maximum for his little pm and made himself the master of nature. However, all efforts to have mastery over the nature have increased his further dependence on nature. On account of such un-thoughtful and ruthless exploitation the human society has vastly modified the ecosystems in different parts of the world and has brought undesirable changes in the natural habitats.

Consequently, some natural stocks of plants and animals have disappeared. About 1000 species are currently threatened with extinction or are dangerously rare. The human encroachment of nature has deprived the world civilization of 130 mammal species and has endangered more than 250 species. Out of the total approximately 0.3 million species of plants in the world, over 20,000 are in the category of either endangered or threatened with extinction. It is estimated that over 1000 animal species and 20,000 flowering plants are likely to be endangered globally.

Food, shelter and clothing are the primary requirements of man. Early human society has used natural resources relatively in much less quantity to cover his wants. Among the most essential requirements is a well cooked food. We know that cooking requires energy. The simplest source of energy available for cooking since the early human history is fuel wood. According to an estimate, about 60.5 per cent of Indian people's fuel wood consumption is fire wood and other agricultural wastes. According to Government of India's "Fuel Wood Policy Committee", the annual demand for fuel is roughly 133 million tonnes which is expected to increase in the next 50 years. One of the most serious aspects of the problem arises from the impact of economic efforts of mankind especially for the purpose of maintaining its existence, protection, survival and betterment of the standard of living. The basic needs which induced the human beings to spoil the natural resources for their welfare have finally led to a situation which threatens to be disastrous. There are various problems which have arisen due to industrial and agricultural developmental activities. Many of these problems are due to mismanagement of natural resources and their impacts are not localized but are universal in nature. It has been estimated that the quantity of CO₂ will be doubled in 23 years and the oil and natural gas resources will be no more available after 50 years and coal will be almost consumed within 150 years.

CAUSES FOR DEPLETION OF NATURAL RESOURCES

- Rapid population increase,
- Pollution,
- High consumption of resources, and
- Deterioration of land.

RAPID POPULATION INCREASE

There has been a tremendous increase in India's population and it has now crossed 128 crores. An increase in population will decrease all types of natural resources and result in environmental pollution. Ultimately, there will be short supply, as well as deterioration in quality of natural resources. This is because increase in population will increase the demand of natural resources and environment. At present, the world population is increasing by two per cent every year. The industrialized countries have annual growth rate of 0.5 to 1 per cent and on the other hand the developing countries have the growth rate of 2 to 3 per cent. The per capita use of energy and mineral resources shows a difference between the developing and developed countries of the world. The developed countries consume less but their resources are enough. The population and per capita consumption have a considerable impact on the environment. The world cannot meet the continuously increasing demand for natural resources.

POLLUTION

We are deteriorating our environment due to increasing population and industrial revolution. We are polluting atmosphere, lakes, and streams, rivers by sewage, industrial wastes, heat, radioactive materials, detergents, fertilizers and pesticides. Besides these, we are releasing a number of toxic materials into our surroundings. The uncontrolled and indiscriminate use of pesticides has disturbed the entire food chains by which animals including man are affected.

CONSUMPTION OF MATERIALS

Due to tremendous increase of population, most of the natural resources are being rapidly consumed. This high rate of consumption has disturbed our ecosystems. But, on the other hand, many of the natural resources are essential basic human needs. Many industries require raw materials which are essential for the advancement of the country. However, their rapid consumption will affect adversely the quality of our environment either by unwise use of natural resources or by increasing pollution.

DETERIORATION OF LAND

Due to excessive consumption of minerals of the soil by cropping or soil erosion or other natural events, fertility of soil is lost and the land deteriorates gradually. Sometimes drought also results in deterioration of land and many nutrients of the top soil are destroyed and soil fertility is lost. As a result of cropping, the cycling of soil mineral nutrients is greatly reduced. Erosion has also depleted soil fertility because most of the minerals remain in the upper part of the soil and they are easily removed by wind or washed away by water. Sometimes water erosion takes its toll of fertile soils. Man has also deteriorated agricultural land and ultimately caused the loss of national economy. It is commonly seen that man cannot degrade one part of his environment without simultaneously affecting other parts. For proper economic development lands for cropping, forest, recreation, transportation and wildlife are needed but their availability is reducing day by day. Therefore, integrated policy of resource management should be practiced; otherwise unexpected future shortage might upset the national economy.

2. TYPES OF NATURAL RESOURCES AND THEIR CONSERVATION

RENEWABLE NATURAL RESOURCES

These resources can be replenished and do not change the ecological balance. The cut trees can be grown again, soil forms again and animals reproduce themselves.

NON RENEWABLE NATURAL RESOURCES

Resources which once used up will be exhausted forever. Overexploitation of natural resources that are limited in stock may cause scarcity and even renewable resources, such as, water, forests, if over-exploited, require long period of time for replenishment. It clears that if the man wants to survive on this planet he must conserve the natural resources rather than merely exploit them. It does not mean mere preservation of the sources without using them. We should use the resources wisely and judiciously without wasting them.

NATURAL RESOURCES AND THEIR CONSERVATION

MINERAL RESOURCES

Now it is known that the world's resources of minerals, oils, coal and natural gases are limited. Mineral resources are of several types metallic minerals and non-metallic minerals. Non-metallic or industrial minerals include a wide variety of substances which comprise the building materials such as rock, sand, gravels, cement and clay.

The non-metallic minerals are fertilizers which are essential to increase agricultural yield. Large amount of nitrogen in the form of nitrates is available in the natural deposits but now it is possible to fix nitrogen synthetically from air. Thus, the deficiency of nitrogen resources is compensated. Phosphorus is obtained from phosphate rocks. Although the phosphorus resources are abundant, yet not evenly distributed Potassium is also quite abundant in the world. Among metals, iron, nonferrous metals, silver and gold are important. Among these, iron is the most important element because it is the main component of steel alloys. Chromium, cobalt, magnesium, molybdenum, nickel, tungsten and vanadium are included under ferroalloy elements. So far as the causes of mineral loss from the soil are concerned, soil erosion and cropping are considered to be the most significant. Most of the soil nutrients remain in the upper part of soil and many minerals of upper soil are carried away by rapid winds or running water and thus the soil becomes deficient in fertile minerals. Soil is the most important resource of nature, it is essential for human existence and provides the basic requirements to man.

At present, there is a great loss of minerals all over the world which should be considered seriously Further, demands for mineral resources must be thought of seriously Although it is difficult to make exact estimate, yet there should be proper relation between demand and supply Sudden shortage of mineral resources results in poor economy It has been estimated that for a number of important minerals the resources are limited.

THERE ARE THREE IMPORTANT CONSERVATION APPROACHES

- To reduce wastes and to minimize demand,
- To change the way of life, and
- To increase reclamation and recycling of materials.

FORESTE ARE PLAYED VITAL

Forest is an important natural resource. It is the most important natural habitat for wildlife. It IS also utilized by farmers for commercial and recreational purposes. Many herbivores find shelter and carnivores search their prey in the forest. Many wildlife store food supplies and breed in the forest. Besides this, forest plays most important role from commercial point of view. It is the source for a large number of products useful to man. It provides raw materials for many products of daily use. It feeds several industries which depend on wood products. Turpentine oil, paints, resins and printing paper industries get raw material from the forest. Man not only benefits from forest, but also gets recreation.

Forest also provides sanctuary for the modern city dwellers. Large number of people visits the forest for peace, beauty and recreation. Forest based cottage industries, such as bee-keeping, bamboo mat and basket making provide means of livelihood to the tribal people. Sal is a most important source for timber industries. Forest also provides raw materials for pulp and plywood industry. Therefore, forest serves as an energy reservoir, trapping energy from sunlight and storing it in the form of a biochemical product. Forest plays a most important role in keeping the atmosphere balanced by consuming CO₂ and releasing O₂, the latter is essential for animal life. So removal of plants and trees would disturb the composition of natural air. An acre of forest absorbs 4 tons of carbon dioxide gas and releases 8 tonnes of oxygen into environment. If a forest is cut down, energy stored in the wood is lost and also most of the nutrients of the system are lost. Such deforestation leaves a poor soil which can support agriculture for only a short time, because the harvesting of the first few crops removes the remaining nutrients and renders the soil useless.

Deforestation shows other disastrous results also. Removal of trees exposes the surface of the land resulting into erosion. In natural forests, the tree roots bind the soil and about 90 per cent of the water falling on the forests is retained either in humus or in the plants tissue. The forest thus acts as a soaking device and plays a vital role in the hydrological cycle. The rain water thus soaked up is gradually released over the days and weeks which supply to streams and rivers even during dry seasons. Hence, it is important to retain forest cover in upland catchment areas as an alternative to flooding the whole barren and uncultivable area. The washed away top soil silts river beds and reservoirs reduce the water holding capacity and flood in the surrounding area is a natural calamity. It has been estimated that in India 60,000 million tonnes of top soil is carried away annually by rain water from deforested area. Forest management programmes should be motivated by forest employees and general public to increase yield, to avoid forest cutting and to prevent forest fires. Whenever plant or timber is cut, that area must be reforested. Similarly, any forest which has been destroyed by insects, diseases, hurricanes that area should be reforested. The primary aim of the forest service is to make the greatest number of forest resources available to the maximum number of people.

THE FOREST DISEASES CAN BE CONTROLLED THROUGH THIS MEASURES

- By eradication of alternative hosts.
- By using suitable antibiotics,
- By DDT spray,
- Sterilization, and
- By using resistant varieties.
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BESIDES THE ABOVE, FOREST MANAGEMENT METHODS RECOMMENDED LIKE

- Reforestation.
- By improving the quality of timber.
- By converting wasteful cutting into quality yield harvesting.
- By increasing forest protection
- By increasing forest area.
- By developing fast growing trees.
- By controlling harmful forest agents.
- By developing the better tree varieties.
- By using disease resistant varieties.

In India about 75 million hectares area is occupied by forest alone which is about 23 per cent of the total land. In India forests have not so far played a significant role in improvement of economic condition of the country. Proper scientific management, conservation and utilization of forest wealth are likely to increase their resource value and utility in the future. At present there is an urgent need to conserve the existing forest resources and to expand the forest area. The most important task is to restore the vegetation cover which is destroyed through our false policies. New forests and wood lots should be created to meet the daily demand of fuel and fodder and to provide more habitat for the wildlife.

The National Commission on Agriculture is giving serious thought to the problem of deforestation and has recommended introduction of “Social Forestry”, i.e., to create multipurpose village wood lots in rural India. Social forestry may be defined as an additional aid to wildlife conservation. “Social forestry is a concept, a programme and a mission which aims at ensuring ecological, economic and social security to the people, particularly to the rural masses especially by involving the beneficiaries right from the planning stage to the harvesting stage. It aims at mixed production system of wood, fiber, fodder, grasses, fruits and other raw materials for self- consumption and cottage industry”.

DIFFERENT COMPONENTS OF SOCIAL FORESTRY PROGRAMME

- Protection and afforestation of degraded forests in the vicinity of human habitations.
- Creation of village wood lots on community lands and government waste lands.
- Block plantation.
- Agricultural crops) on marginal and sub-marginal farm
- Tree planting around habitation area, field boundaries and pasture development
- Control of soil erosion by planting trees or shrubs.
- Strip plantation along road sides, canals and rail lines.

JOINT FOREST MANAGMENT (JFM)

Participation of local public is needed in forest management programme. Local people, farmers, students and women help in greening an area, if they get some economic benefit from forest conservation. There must be coordination and mutual cooperation between local communities and the Forest Department. This step started first, in 1972, in West Bengal. The concept of social forestry is also the same. In this programme, local population and Forest Department are involved in plantation. Joint Forest Management (JFM) programmes involve an agreement between the local people and the Forest Department.

WILD LIFE RESOURCES

Nature has gifted us a priceless biotic wealth, the wildlife which is a thing of beauty. It needs to be preserved rather than destroyed. In broad sense, the wildlife involves animals living in a natural, undomesticated state and uncultivated plants and microbial communities living within their natural environment. Wild fauna has a positive role in formation of ecosystem by pollination, seed and fruit dispersal and selective breeding etc. Wildlife provides recreational and economic benefits to man. Recreational and economic benefits are closely related to each other. For instance, fishing and hunting provide entertainment and economic benefit to man.

The developmental projects such as mining, agriculture, shifting cultivation, major water resources, major engineering activities, timber extraction have created special problems of habitat and wildlife management in the tropical forests and as a result, tropical forests are diminishing rapidly. Major canals and irrigation projects have created problems of wildlife management. Selective polycyclic logging in the forest is disturbing the wildlife in the same way as cyclones and destruction of natural forests disturb wildlife.

RED DATA BOOK

International Union for Conservation of Nature (IUCN) has published Red Data Book which maintains a collection of all the available data on the species threatened with extinction. Several criteria have been listed in the book to indicate the endangered state of the species, such as restricted distribution, narrow habitat tolerance, migration across international boundaries, behavioral non- adaptiveness to technical advances, over exploitation, habitat destruction, competition for food, accidental killings and so on. Wildlife includes 850 species of mammals, 1200 species and 2,100 sub-species of birds and more than 20,000 species of insects. According to the Red Data Book, about 277 species of mammals and 321 spp. of birds are considered to be endangered or likely to become extinct. The World Wildlife Fund (WWF) under International Union for Conservation of Nature (IUCN) is concerned with the conservation of wildlife and several projects have been launched for conservation of natural forests and wildlife. In its diversity of life forms India is the second largest country in the world.

The causes of decline of wildlife in India are many. Wild elephants were captured and trained for use in war. Rhinos were killed for making shield. Rulers of princely states indulged in killing of wild animals as their hobby. Forests were cleared for development of agriculture, industry and other developmental projects. Wild animals were mercilessly killed which resulted in decline in their number and they are facing extinction now. The extinction of species is a general biological principle of evolution and the change of living conditions happened to be the main reason for extinction. The extinction of species is followed by replacement by the new species which are better adapted to changed conditions. This is how the species diversity and biological equilibrium is maintained in nature and the evolution continues.

THE MAIN FACTORS TO EXTINCTION OF FLORA AND FAUNA

- Habitat destruction or contamination of the habitat which accounts for about 67% extinction.
- Over exploitation which accounts for about 37% extinction.
- Introduction of exotic species which accounts for about 19% of the total extinction.
- Competition for food may account for about 7% of extinction.
- Accidental killing which accounts for about 2% of extinction.

Today wildlife species are gradually disappearing and their number is becoming reduced. Many species of wildlife have become extinct or are on the way to extinction. Up till now 106 species of mammals and 139 species of birds have become extinct due to climatic and geographical changes or hunting by man. Today the lions are limited in number. The number is around 200 in the Gir forest of Gujarat. The rhino existed in Indus valley in the vicinity of Mohenjo-Daro some 5000 years ago. The rhinos are now found in certain parts of Nepal, West Bengal and Assam.

3. CONCLUSION

This paper highlights the significance of natural resources and their utilization, in addition to an inalienable relationship between human beings and natural biodiversity. NRM refers to the management of natural resources such as land, water, soil, plants and animals, with a specific focus on how management affects the overall quality of life. Indigenous people happen to be the carriers of ancestral knowledge and wisdom regarding biodiversity. Their active participation in biodiversity conservation programs is essential for resource management to be more effective and cost-efficient. A comprehensive NRM approach is very critical to human survival and prosperity.

Under diverse natural conditions, over a billion people in rural and urban areas live in harmony under a democratic system in India. However, the loss and fragmentation of natural habitats invariably affect all animal and plant species. The predominant causes underlying the declining forest cover are over-exploitation, overgrazing, encroachments, unsustainable practices, forest fires, and non eco-friendly development projects in the forested areas. Forest resources help protect ecological systems besides enhancing the quality of environment by way of controlling soil erosion and water retention. But, increasing population and commercial demand for wood have dented the natural forest cover nurtured by our ancestors.

Considering that local knowledge is no longer receiving its due attention in modern India, the loss of natural biodiversity has doubled with conservation becoming much more challenging. Along with science, local technologies and people's knowledge regarding ethno forestry have an important role to play in biodiversity conservation and sustainability. A balance between local and formal institutions can result in empowerment, security and opportunities for local people. Also equity of knowledge provides an opportunity for local people to participate in the management of local resources with global implications.

Participatory resource management is often seen as an appropriate approach to reducing rural poverty and resource degradation. A long held perception is that common property resource appropriators can create local management institutions that can ensure an equitable access to the locally based natural resources. India was one of the first nations in the world to have established a professional forest service system under the provisions of the Forest Act 1865. The first forest policy of 1894 had upheld the right of the state to an exclusive control over the forest resources.

There is a need for promoting social and economic infrastructure development for realizing the potential benefits of the market economy through natural resource policies that incorporate the environment as well as local people's rights and local economies. Farmers in the developing countries possess a fairly sophisticated knowledge of agriculture and natural resource management which is recognized as being more eco-friendly and sustainable. Reforming and strengthening of natural resources governance and the sustainable natural resource uses and conservation through promoting the modernization conservation. There is an urgent need to sensitize the local people on environmental laws and protection of natural resources. Strict and vigilant follow-ups are also needed to conserve the gifted resources.

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