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INTRODUCTION

The great variety of life on earth has provided for man's needs over thousands of years. This diversity of living creatures forms a support system which has been used by each civilization for its growth and development. Those that used this "bounty of nature" carefully and sustainably survived. Those that overused or misused it disintegrated.

Science has attempted to classify and categorize the variability in nature for over a century. This has led to an understanding of its organization into communities of plants and animals. This information has helped in utilizing the earth's biological wealth for the benefit of humanity and has been integral to the process of 'development'. This includes better health care, better crops and the use of these life forms as raw material for industrial growth which has led to a higher standard of living for the developed world. However, this has also produced the modern consumerist society, which has had a negative effect on the diversity of biological resources upon which it is based. The diversity of life on earth is so great that if we use it sustainably, we can go on developing new products from biodiversity for many generations. This can only happen if we manage biodiversity as a precious resource and prevent the extinction of species.

What is biodiversity?

Biological diversity deals with the degree of nature's variety in the biosphere. This variety can be observed at three levels; the genetic variability within a species, the variety of species within a community, and the organisation of species in an area into distinctive plant and animal communities constitutes ecosystem diversity.

Genetic diversity

It includes the genetic variations within species, both among geographically separated populations and among individuals within single population.

Species diversity

It includes full range of species from microorganisms to giants and mammoth varieties of plants and animals, e.g. single celled viruses and bacteria etc. and multi-cellular plants, animals and fungi. ***Ecosystems diversity***

Its studies variation in the biological communities in which species Jive, exist and interact.

Biodiversity and Conservation Because genes are parts of species, and the species make up ecosystems- the concept of biodiversity reflects an interrelationship among its three components.

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Biodiversity is distributed uniformly across the globe. It is substantially greater in some areas than in the others. Generally, species diversity increases from the poles towards the tropics- for instance, among the terrestrial systems, the tropical moist forests, which cover only 57% of the earth's land area, possess as much as over 50% of the world's species.

BIOGEOGRAPHIC CLASSIFICATION OF INDIA

Our country can be conveniently divided into ten major regions, based on the geography, climate and pattern of vegetation seen and the communities of mammals, birds, reptiles, amphibia, insects and other invertebrates that live in them. Each of these regions contains a variety of ecosystems such as forests, grasslands, lakes, rivers, wetlands, mountains and hills, which have specific plant and animal species.

India's Biogeographic Zones

1. The cold mountainous snow-covered Trans Himalayan region of Ladakh.

2. The Himalayan ranges and valleys of Kashmir, Himachal Pradesh, Uttarakhand, Assam and other North Eastern States.

3. The Terai, the lowland where the Himalayan rivers flow into the plains.

4. The Gangetic and Brahmaputra plains.

5. The Thar Desert of Rajasthan.

6 The semi-arid grassland region of the Deccan plateau Gujarat, Maharashtra, Andra Pradesh, Karnataka and Tamil Nadu.

7. The Northeast States of India,

8. The Western Ghats in Maharashtra, Karnataka and Kerala.

9. The Andaman and Nicobar Islands.

10. The long western and eastern coastal belt with sandy beaches, forests and mangroves.

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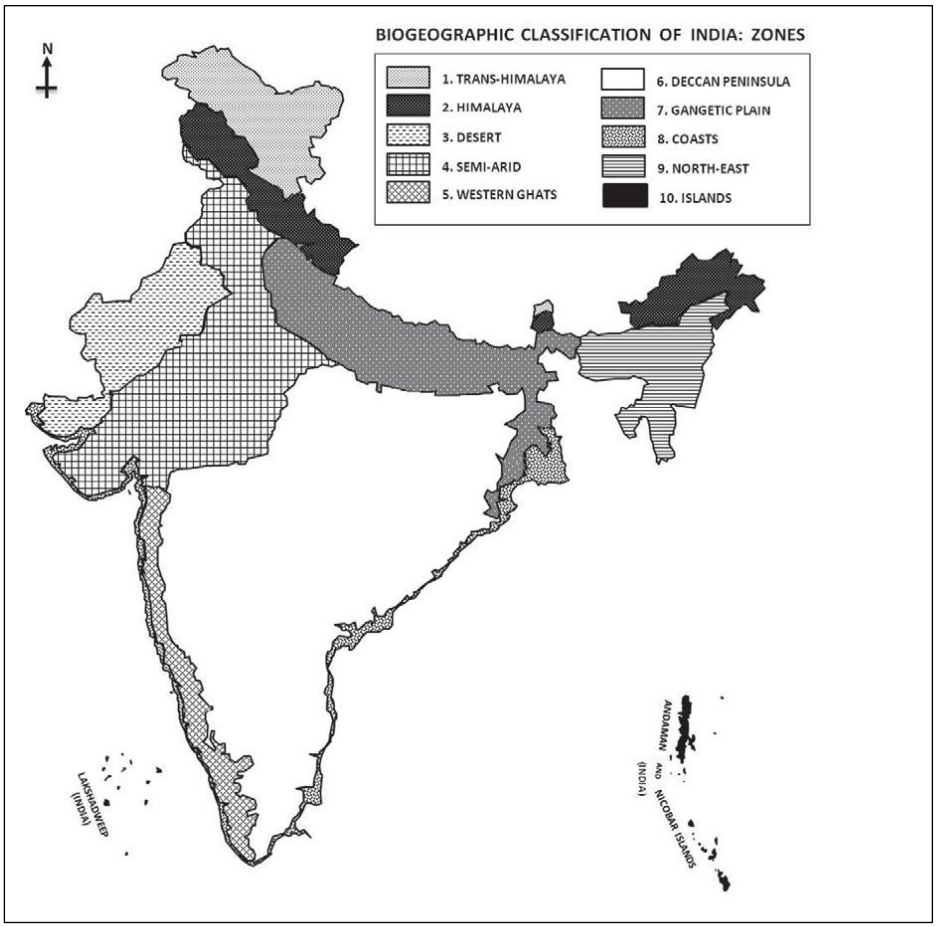

INDIA AS A MEGA DIVERSITY NATION

Geological events in the landmass of India have provided conditions for high levels of biological diversity. A split in the single giant continent around 70 million years ago, led to the formation of northern and southern continents, with India a part of Gondwanaland - the southern landmass, together with Africa, Australia and the Antarctic. Later tectonic movements shifted India northward across the equator to join the Northern Eurasian continent. As the intervening shallow Tethis Sea closed down, plants and animals that had evolved both in Europe and in the Far East migrated into India before the Himalayas had formed. A final influx came from Africa with Ethiopian species, which, were adapted to the Savannas and semi-arid regions. Thus, India's

special geographical position between three distinctive centres of biological evolution and radiation of species is responsible for our rich and varied biodiversity.

Among the biologically rich nations, India stands among the top 10 or 15 countries for its great variety of plants and animals, many of which are not found elsewhere. India has 350 different mammals (rated eight highest in the world), 1,200 species of birds (eighth in the world), 453 species of reptiles (fifth in the world) and 45,000 plant species, of which most are angiosperms, (fifteenth in the world). These include especially high species diversity of ferns (1022 species) and orchids (1082 species). India has 50,000 known species of insects, including 13,000 butterflies and moths. It is estimated that the number of unknown species could be several times higher.

It is estimated that 18% of Indian plants are endemic to the country and found nowhere else in the world. Among the plant species the flowering plants have a much higher degree of endemism, a third of these are not found elsewhere in the world. Among amphibians found in India, 62% are unique to this country. Among lizards, of the 153 species recorded, 50% are endemic. High endemism has also been recorded for various groups of insects, marine worms, centipedes, mayflies and fresh water sponges.

Apart from the high biodiversity of Indian wild plants and animals there is also a great diversity of cultivated crops and breeds of domestic livestock. This is a result of several thousand years during which civilizations have grown and flourished in the Indian subcontinent. The traditional cultivars included 30,000 to 50,000 varieties of rice and a number of cereals, vegetables and fruit. The highest diversity of cultivars is concentrated in the high rainfall areas of the Western Ghats, Eastern Ghats, Northern Himalayas and the North-Eastern hills. Gene-banks have collected over 34,000 cereals and 22,000 pulses grown in India. India has 27 indigenous breeds of cattle, 40 breeds of sheep, 22 breeds of goats and 8 breeds of buffaloes.

ENDANGERED AND ENDEMIC SPECIES OF INDIA

The Forest administration in India is more than 100 years old. Efforts to identify plant species as a part of wildlife and to recognize the importance for providing special protection to endangered plant species have so far been negligible. The extinction of certain attractive animals stimulated efforts to protect fauna, but no special heed was given to flora. The word 'Wildlife' had till recently been considered synonymous with animal life and consequently, conservations and naturalists have their attention only to conservation of animal species.

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It was only in the year 1968 at an International Conference (UNESCO 1968) that the problem of conservation of flora and fauna was appreciated and several recommendations were made urging the International Biological Programme (IBP), the International Union for Conservation of Nature and Natural resources (IUCN) and various international and national organizations to initiate studies in to the problems involved, particularly the problem of protecting and preserving wild fauna and flora in their natural habitat/ecosystems establishing nature reserves.

IUCN Red List of Threatened Species

The **IUCN Red List of Threatened Species** (also known as the **IUCN Red List** or **Red Data List**), founded in 1964, is the world's most comprehensive inventory of the global conservation status of biological species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. A series of Regional Red Lists are produced by countries or organizations, which assess the risk of extinction to species within a political management unit.

The IUCN Red List is set upon precise criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. The aim is to convey the urgency of conservation issues to the public and policy makers, as well as help the international community to try to reduce species extinction. According to the International Union for Conservation of Nature (IUCN) (1996), the formally stated goals of the Red List are (1) to provide scientifically based information on the status of species and subspecies at a global level, (2) to draw attention to the magnitude and importance of threatened biodiversity, (3) to influence national and international policy and decision-making, and (4) to provide information to guide actions to conserve biological diversity.

IUCN Red List Categories

Species are classified by the IUCN Red List into nine groups,[12] specified through criteria such as rate of decline, population size, area of geographic distribution, and degree of population and distribution fragmentation. There is an emphasis on the acceptability of applying any criteria in the absence of high quality data including suspicion and potential future threats, "so long as these can reasonably be supported.":6[13]

- Extinct (EX) – beyond reasonable doubt that the species is no longer extant.
- Extinct in the wild (EW) – survives only in captivity, cultivation and/or outside native range, as presumed after exhaustive surveys.
- Critically endangered (CR) – in a particularly and extremely critical state.
- Endangered (EN) – very high risk of extinction in the wild, meets any of criteria A to E for Endangered.
- Vulnerable (VU) – meets one of the 5 red list criteria and thus considered to be at high risk of unnatural (human-caused) extinction without further human intervention.
- Near threatened (NT) – close to being at high risk of extinction in the near future.
- Least concern (LC) – unlikely to become extinct in the near future.
- Data deficient (DD)
- Not evaluated (NE)

In the IUCN Red List, "threatened" embraces the categories of Critically Endangered, Endangered, and Vulnerable.

Endemic Species

"Endemic species is that ecological state of a species where a species is unique to a defined geographical location."

A list of the endemic species of India is mentioned below:

Asiatic Lion, Gir Forest

Asiatic Lion is also known as the Indian Lion and can be only found in and around Gir Forest National Park of Gujarat. These are listed as endangered species. These are one of the five big cats found in India, the others being Indian Leopards and Bengal Tigers.

Kashmir Stag, Kashmir Valley

Also known as Hangul, Kashmir Stag is found in the dense forests of Dachigum National Park, Kasmir Valley and Chamba district, Himachal Pradesh.

Lion-Tailed Macaque, Western Ghats

It is the rarest and the most threatened and endangered primate species found only in the Western Ghats of Southern India.

Purple Frog, Western Ghats

The purple frog, also known as Pignose frog is only found in the rainforests of western ghats in India. It spends most of its life underground.

Sangai Deer, Loktak Lake

It is also known as Brow Antlered Deer exclusively found in Keibul Lamjao National Park of Manipur. This park is a marshy wetland located in the southern parts of Loktak lake.

Nilgiri Tahr, Nilgiri Hills

It is a wild sheep species, endangered and endemic to the Nilgiri Hills of Western Gats.

HOTSPOTS OF BIODIVERSITY

The earth's biodiversity is distributed in specific ecological regions. There are over a thousand major ecoregions in the world. Of these, 200 are said to be the richest, rarest and most distinctive natural areas. These areas are referred to as the Global 200. It has been estimated that 50,000 endemic plants which comprise 20% of global plant life, probably occur in only 18 'hot spots' in the world. Countries which have a relatively large proportion of these hot spots of diversity are referred to as 'megadiversity nations'. The rate at which the extinction of species is occurring throughout our country remains obscure. It is likely to be extremely high as our wilderness areas are shrinking rapidly. Our globally accepted national 'hot spots' are in the forests of the North-East and the Western Ghats, which are included in the world's most bio rich areas. The Andaman and Nicobar Islands are extremely rich in species and many subspecies of different animals and birds have evolved. Among the endemic species i.e. those species found only in India, a large proportion are concentrated in these three areas. The Andaman and Nicobar Islands alone have as many as 2200 species of flowering plants and 120 species of ferns. Out of 135 genera of land mammals in India, 85 (63%) are found in the Northeast. The Northeast States have 1,500 endemic plant species. A major proportion of amphibian and reptile species, especially snakes, are concentrated in the Western Ghats, which is also a habitat for 1,500 endemic plant species.

Coral reefs in Indian waters surround the Andaman and Nicobar Islands, Lakshadweep Islands, the Gulf areas of Gujarat and Tamil Nadu. They are nearly as rich in species as tropical evergreen forests!

THREATS TO BIODIVERSITY

The biggest reason for the current increase in extinctions is habitat loss. Destruction of tropical forests, coral reefs, estuaries. Marshes, and other biologically rich ecosystems threaten to eliminate thousands or even millions of species in a human-caused mass extinction that could rival those of geologic history. By destroying habitat, we eliminate not only prominent species but also many obscure ones of which we may not even be aware. Over harvesting of food species is probably the most obvious way in which humans directly destroy biological resources. There are many, historic examples of human disturbances of natural systems. Once-fertile areas have become deserts because of unsound forestry, grazing, and agricultural practices. Technology nm" makes it possible for us to destroy vast areas even faster than in the past. Undoubtedly the greatest current losses in terms of biological diversity and unique species occur when tropical moist forests are disrupted.

Main Causes of Threat to Species

It is well known now that several plant species have become extinct due to certain natural phenomena, such as land upheavals, volcanic eruptions, glaciations, protracted periods of rain or drought, spreading of desert lands, forest fires and eutrophication in the geological past. While such natural processes in the past had no doubt led to the extinction of flora, the resulting new environmental conditions had also resulted in the evolution and speciation of new flora and migration of floral elements.

But, in recent times man with his anthropogenic associates and other factors or practices such as fire or 'slash and burn' for shifting cultivation (also called as 'jhum' or 'podu' cultivation in India), grazing by cattle and by several other mechanical means, has suddenly accelerated disastrous condition in natural ecosystems. Besides, commercial exploitation of entire plants, roots, rhizomes, tubers bulbs seeds and fruits has been the prime cause of depletion of more important wild economic plants throughout the world for lucrative financial gains, in the trade which flourishes both by legal and illegal means Rauvolfia serpentina, Coptis teeta, Dioscorea sp. and Podophylum hexandrum serve as good examples.

Habitat Destruction

Deforestation has been one of the major causes for the depletion of wildlife. With the increase in human population and the growing need for resources, forests were cleared or for agricultural operations, for human habitation and for grazing their livestock. Technological advance and human progress had a direct bearing on the exploitation of natural resources. Forest trees were cut to yield timber for building houses, for making furniture and for collecting wood as fuel. Industries made a heavy demand on forest resources such as wood for paper- making, exploitation of gums and resins, mining. of forestland for mineral ores, building materials, etc.

Habitat destruction thus has an adverse impact on wildlife as it leads to the loss of an environment, which provides them food and breeding grounds or nesting sites to facilitate rearing of their young ones. Wild animals are left with no alternative but to adapt, migrate or perish. Widespread habitat loss all over the country has diminished the population of many species, making them rare-and endangered. In our race for progress and prosperity we have disturbed the delicate balance of Nature.

Hunting and Poaching

Uncontrolled hunting of wildlife for pleasure, food, furs. Skins, horns, tusks, etc. pose a serious threat to the survival of wildlife. In India, the Cheetah was hunted to extinction. The illegal trade in animal skins has been responsible for the destruction of a large number of tigers, leopards, deer, fishing cat, crocodiles and snakes, as well as birds with beautiful plumage. Elephants were hunted for ivory. The rhinoceros was killed for its horns because of the superstitious belief that it contained aphrodisiac properties. There are laws in the country to prevent such illegal trade, but unscrupulous elements, traders and exporters often violate these. Added to this is the practice of trade in exotic mammals, birds and reptiles and use of wild animals in biomedical research.

Pollution

Pollution of air, water and soil due to various industrial activities not only affect our health, but the health and well being of animal population also. Industrial effluents one reaching water bodies adversely affect aquatic life. Pesticides like DDT and Dieldrin are very harmful. These have a major effect particularly sea birds and their eggs. Oil pollution is another serious problem affecting the seas through leakage from cargo ships or accidents.

Besides there are other numerous factors that affect wildlife population, which are mostly anthropogenic. Introduction of exotic species, unhealthy agricultural practices, diseases introduced by domesticated animals, silting of rivers, floods and droughts are a few to name some. These all have somehow contributed to the process of endangering animal species.

2. *Man and Wildlife Conflict*

Man, by virtue of his nature is destructive and self-centred despite the fact that he is known as social animal. Until he realizes the need of time no rules and regulations may help. The exploitation of forests and wildlife or rare species for commercial purposes should be stopped. A good tiger skin is worth more than five thousand rupees. The tusks of an elephant and the skin of big cats also fetch a good prize. The horns of rhinoceros carry a highly fancy prize. This high market value has led to unlimited slaughter of these animals.

CONSERVATION OF BIODIVERSITY

The hope for conservation of natural biodiversity however rests on preservation of selected ecosystems and representative areas of different vegetation types in the country. as well as on saving some of the extinction-prone species. The number of endangered species of plants and animals is on the rise, which has prompted government and non-governmental organizations to take certain steps in this direction. Forestry and wildlife were primarily under the control of state governments but later on looking to the gravity of the situation a separate Ministry of Environment and Forests was established.

The aims and objectives of wildlife management in India includes the following

(i) Protection of natural habitats.

(ii) Maintenance of a viable number of species.

(iii) Establishment of biosphere reserves.

(iv) Protection through legislation.

IN-SITU AND EX-SITU CONSERVATION OF BIODIVERSITY

The goal of biodiversity conservation can be attained in a number of ways. The concept of gene banks regulates all these methods.

In-situ conservation

It can be defined as the conservation of plants and animals in their native ecosystem (natural habitats) or even man-made ecosystem, where they naturally occur.

This type of conservation is applicable to wild flora and fauna as conservation is achieved through protection of populations in their natural ecosystems. The concept of protected areas falls under this category e.g. National Parks, Sanctuaries and Biosphere reserves etc.

Ex-situ conservation

It can he defined as the conservation of plants and animals away from their natural habitats, which includes collection of samples of genetic diversity and their treatment in the laboratory, where they are cultured.

The concept of 'gene banks' has primarily become the talk for ex-situ conservation as it is important for conservation of agricultural crops and forestry-based afforestation programmes. Genetic resource centres fall under this category and include botanical gardens, zoos etc.

INSTITUTIONS FOR "EX-SITU" CONSERVATION OF BIODIVERSITY

National Bureau of Plant Genetic Resources (NBPGR)

The set up was established in 1976 by the Indian Council of Agricultural Research (ICAR) New Delhi for "Ex-Situ" conservation of plant genetic resources for Agri-horticultural and Agri-silvicultural activities. Built- in long term cold storage (Gene Banks) have been installed in New Delhi to conserve genetic resources at low temperature of 20°C. At present, NBPGR holds about 48.5 thousand accessions of diverse species of economically important plants (Khanna & Singh 1987). A number of scientific organizations dealing with storage of genetic material of various crop plants have been established in India after independence. They are "Rice Research Institute", Cuttack, "Potato Research Institute", Shimla & "Indian Institute of Horticultural Research", Bangalore.

National Bureau of Animal Genetic Resources (NBAGR)

It was established in the 1980's in Kamal, Punjab: for preservation of germless of improved varieties of cattle's-cows, buffaloes, goats, sheep, camels and oxen and their various breeds found in different parts of India. Other organizations for "ex-situ" conservation of animal germplasm are "National Bureau of Fish Genetic Resources". Lucknow and Wildlife Research Institute of India, Dehradun. At WRI a "gene bank" of all wild and domesticated animals of India is coming up.

Protected areas of India for "In-Situ" Conservation of Biodiversity:

Three types of protected areas-

1. Wildlife Sanctuaries

2. National Park;

3. Biosphere Reserves were created in India for "In Situ" conservation of biodiversity.

As on 31 March 1994 there were 421 Wildlife Sanctuaries, 75 National Park, 14 Biosphere Reserved in India covering about 4% of total geographical area. In-situ conservation of wildlife is a comprehensive system of protected areas. There are different categories of protected areas, which are managed with different objectives for bringing benefits to the society. The major protected areas include: (i) National Parks, (ii) Sanctuaries, (iii) Biosphere Reserves etc. These areas vary considerably in size, design, purpose and effectiveness of management.

National Park

According to the Indian Board for Wild Life (IBWL), "a National Park is an area dedicated by statute for all time to conserve the scenery, natural and historical objects, to conserve the wild life there in and to provide for enjoyment of the same in such manner and by such means, that will leave them unimpaired for the enjoyment of future generations with such modification as local conditions may demand".

The history of National parks in India begins in 1936 when the Hailey (now Corbett) national parks of United Provinces (now Uttar Pradesh) was created. The area is declared for the protection and preservation for all time of wild animal life and wild vegetation for the benefit and advantage and enjoyment of the general public. In this area hunting of fauna or collection of flora is prohibited except under the direction of park authority.

Sanctuary

The Indian Board for Wild Life has defined a sanctuary as, 'An area where killing, hunting, shooting or capturing of any species of bird or animal is prohibited except by or under the control of highest authority in the department responsible for the management of the sanctuary and whose boundaries and character should be sacrosanct as far as possible. By June 1992 India had 416 sanctuaries. The Board has further clarified the position by stating that while the management of sanctuaries does not involve suspension or restriction of normal forest operation, it is desirable to aside a completely sacrosanct area within a sanctuary to be known as 'Abhayaranya'. It has also indicated that sanctuaries should be made accessible to the public.

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In India sanctuary is usually created by an order or gazette notification of State government. So, the weakness of a sanctuary is that it can be denaturized merely by another order or gazette notification of a State government because it is not safeguarded by any proper legislation. The idea behind a wild life sanctuary and a national park is same, i.e., maximum protection, preservation and conservation of wild animals. But the fundamental difference between the two is that a sanctuary is created by order of a competent authority, who may be the chief conservator of forest: or minister of a State, while a national park can be harmed, abolished or changed only by the legislation of a State. There are, title status and degree of permanency and protection is much higher in a national park than in a sanctuary. In a wild life sanctuary private ownership rights may continue, and forestry usages also may continue so long as wild life conservation is not adversely affected. However, in a national park all private ownership rights are extinguished, and all forestry and other usages are prohibited. Every national park should have the minimum requisites of fauna, flora and scenery etc. There should be sufficient means of management and protection in a sanctuary to be upgraded as national park.

Biosphere Reserves

Biosphere Reserves have been described as undisturbed natural areas for scientific study as well as areas in which conditions of disturbance are under control. These serve as the centres for ecological research and habitat protection, The Biosphere consists of main zones as: Core zone, Buffer zone and Manipulation zone.

Nilgiri Biosphere Reserve is the first biosphere reserve in India. However, the concept of 'biosphere reserve' has no legal position in India.

UNESCO launched biosphere Reserve National Programme in 1971 under its Main and Biosphere Programme (MAB). The main objectives of the programme are as follows:

- Conserve biological diversity
- Safeguard genetic diversity
- Provide areas for basic and applied research
- Opportunity for Environmental Science and training
- Promote international cooperation
- Promote management of biotic resources.

The Value of Biodiversity

Ecosystems and species provide an enormous range of goods and other services - immediate as well as long term, material as well as spiritual and psychological - which are vital to our well being. The values of the earth's biological resources can broadly be classified into

Direct Values

Consumptive and productive uses.

Food Resources: Grains, vegetables, fruits, nuts, condiments, tea-coffee, tobacco, liquor, oil from plant resources; and meat, fish, egg, milk (and milk products), honey, etc. from animal resources.

Other Resources:

Medicine, fuel, timber, household accessories, fodder, fiber, fertilizer, wool, leather, paint, resin, wax, thatch. Ornamental plants, rubber, creams, silk, feathers, decorative items, etc. Indirect Values

Non-consumptive uses and options for the future.

1. Carbon fixing through photosynthesis, which provides the support system for species.

2. Pollination, gene flow, etc.

3. Maintaining water cycles, recharging ground water, protecting watersheds.

4. Buffering from climatic extreme conditions such as flood and drought;

5. Soil production and protection from erosion; 6. Maintaining essential nutrient cycles, e.g. carbon, nitrogen, and oxygen and others.

7. Absorbing and decomposing pollutants, organic wastes, pesticides, air and water pollutants;

8. Regulating climate at both macro and micro levels;

9. Preserving recreational, aesthetic, socio-cultural, scientific, educational, ethical and historical values of natural environments.

(i) *Consumptive Use.* Man is mostly dependent on plant and animal resources for his' dietary requirements. A major share of our food comes from domesticated crops and animals. Still we derive major of food from wild species. A large section of human population is dependent on food, which we gather from seas, and oceans that is harvested from free roaming wild organisms. Seafood is rich in minerals and vitamins and contains up to 60 percent of the protein. Unfortunately, deforestation, hunting and clearing of forests, grazing and expansion of agricultural lands removes potentially valuable food species and the wild ancestors of our domestic crops.

(ii) *Productive Use.* Trade and commerce industry is very largely dependent on forests. Besides, timber, firewood, paper pulp, and other wood products, we get many valuable commercial products from forests. Herbs of medicinal value. Rattan, cane, sisal, rubber, pectins, resins, gums, tannins, vegetable oils, waxes, and essential oils are among the products gathered in the wild form forest areas. Like Himalayan forests serve as a storehouse of medicinal herbs, which are presently being used to cure many diseases. Many wild species e.g. milkweeds, etc. are also being investigated as a source of rubber, alkaloids, and other valuable organic chemicals.

Medicine. Many medicinal and aromatic plants are being exploited in the wild to tap their potential for different ailment cure in the field of drug extraction e.g. Hippophae rhamnoides, Ephedra Kerardiana. Dactylorrahiza hatageria etc. Besides, they are being cultured in plantations and protected in wild to encourage in-situ and ex-situ conservation viz. Valley of flowers, Rohtang in Kullu, Lahu & Spiti Valley. Animal products are also sources of drugs, analgesics pharmaceuticals, antibiotics, heart regulators, anticancer and ant parasite drugs, blood pressure regulators, anticoagulants, enzymes, and hormones.

(iv) *Ecological Benefits*. Man cannot have control over nature in the wild. It can only put "pressure on resources and pollute environment. Then what makes environment act as a self-replenishing system with respect to resource generation and self cleanliness. To answer this comes into picture the role of biological communities. The processes of soil formation, waste disposal, air and water purification, nutrient cycling, solar energy absorption, and management of biogeochemical and hydrological are all beyond the scope of man's control. Non-domestic plants, animals, and microbes do this favor to mankind by maintaining ecological processes at no cost. These also serve as a library of gene pool. Wild species of plants and animals exercise control over disease-carrying organisms and in suppressing pests. Food chain explains how nature keep a control over population of organisms wherein organisms of small size and larger in number are consumed by organisms large in size and smaller in number to next higher tropic level. Hence,

preservation of natural areas and conservation of wild species should be encouraged and practiced to restore the biological wealth.

Aesthetic Use

Wild species of plants and animals have always appealed man's . psyche. Human society has evolved from his early habitat in the forests, which abounds in flora and fauna. Till date his instinct to observe nature in the wild calls him from socially and culturally an evolved society, as tourist from far and wide places. Thousands of tourists visit national park, sanctuaries and forests throughout the country and especially in mountainous areas. A glance of temperate grasslands perhaps the most beautiful landscape pleases and comforts man. All domestic plants have evolved from wild ancestors and food gathering is no longer a necessity for man but still thousands enjoy hunting, fishing and other adventurous outdoor activities that involve wild species. Such environment and playful exercise gives man an opportunity to renew his pioneer skills, and be at mental ease after leading a hectic day in today's life. Man enjoys his surrounding by decorating it with images of wild animals and plants. (vi) Cultural Benefits.

A particular species or community of organisms may have emotional value for a group of people who feel that their identity is inextricably linked to the natural components of the environment that shaped their culture. This may be expressed as a religious value, or it may be a psychological need for access to wildlife. In either case, we often place a high value on the preservation of certain wild species.

(vii) ***Option Values***. This refers to the use of various species for the benefit of mankind, sometime in future. The hunt for various species under the scope of biotechnology. is already underway for finding solutions to various environmental problems. The environmental issues being addressed to be: pollution as a major problem, ways to fight various disease viz., cancer, diabetes etc., AIDS and others.

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