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Biodiversity Conservation and Management

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ABSTRACT

The climate of the Earth is changing from years to year due to the human activities and naturally occurring processes. Biodiversity is the biological diversity which includes the variety of the all species present on earth. It includes plants, animals, micro-organisms and their genes, terrestrial, water ecosystems, and marine ecosystems in which they all are present. Biodiversity is considered at three different levels including species diversity, genetic diversity and ecosystem diversity. Biodiversity provides food from livestock, fish, crops, and forestry. It is of use to modern agriculture as a source of new crops, as a source of material for breeding improved varieties and as a source of new biodegradable pesticides. Biodiversity is a rich source of substances with therapeutic properties. Some of the existing measures of biodiversity conservation include; zoological gardens, botanical gardens/arboretums, seed banks, national parks and game reserves. Biodiversity is very important for our existence as well as valuable in its own right. Many of the important pharmaceuticals have originated as plant-based substances, which are of incalculable value to human health. This is because it provides the fundamental building blocks for many goods and services which provide a healthy environment to lead our life. Conservation and sustainable uses of biodiversity have been an integral part of Indian ethos. The varied eco-climatic conditions coupled with unique geological and cultural features have contributed to an astounding diversity of habitats, which harbor and sustain immense biological diversity at all levels. The challenge is for nations, government agencies, organizations and individuals to protect and enhance biological diversity, to ensure intra and intergenerational equity, it is important to conserve biodiversity.

Keywords: Biodiversity, Human activities, Conservation, Values

I. INTRODUCTION

The climate of the Earth is changing from years to year due to the human activities and naturally occurring processes. By the human activities like industrialization, pollution due to Industrial revolution mean surface temperature of Earth increased at an average of 10 Celsius per century. Due to the accumulation of green house gases in atmosphere and also due to the water pollution the water quality is also changing & to adjust to the changed environmental conditions some adaptations occurs in the organisms to adjust the changed environmental conditions & Mutations are also occurring due to this mutations in genetic makeup of the organisms, the newer species are arising and many species which do not change according to the changes, becoming extinct.

Biological diversity or Biodiversity is threat part of nature which includes the differences in genes among the individuals of a species, the variety and richness of all the plant and animal species at different scale in space, locally, in a region, in the country and world,

various types of ecosystems, both terrestrial and aquatic, within a defined area."

Thus, biodiversity includes genetic variation within species, the variety of species in an area, and the variety of habitat types within a landscape. Biodiversity is of much importance to functioning of all natural and manmade ecosystems. Living organisms play central roles in the cycles of major elements (Carbon, nitrogen, etc) and water in environment and diversity specifically is important, thus these cycles require numerous interacting species.

II. LITERATURE REVIEW

The term biodiversity was coined by Walter and Rosen (1985) and is the abbreviate word for Biological diversity (Samit Roy and Arun K. Roy 2010). Biodiversity or biological diversity refers to the range of life forms on Earth, including millions of plants, animals and microorganisms. During the last 200 million years, 100 to 1,000 species became extinct in each century (Wilson 1988)) forth new life forms replacing species that were lost. Today, we are losing about 1,500 species every two months (Kothari 1992). That's why the year 2010 & decade 2010-20 is declared as the international biodiversity year & decade respectively. The 1992 United Nations Earth Summit in Rio de Janeiro defined 'biodiversity' as "the variability among living organisms from all sources, including, 'inter alia', terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems" (UNEP 1992).

III. OBJECTIVES OF THE STUDY

The Study is based on following objectives:

1. To know the present scenario of Biodiversity.
2. To know importance of Biodiversity.
3. To know the different types of Biodiversity.
4. To know the values of Biodiversity.
5. To know the profile of Biodiversity in India

IV. RESEARCH METHODOLOGY

The study is based on secondary data. Data has been collected from National and International Journals, Government publication and websites related to Biodiversity. On the basis of data available from various sources research finding and conclusion are made.

V. RESEARCH FINDINGS

A) Types of Biodiversity

1. Genetic diversity

Genetic diversity is the raw material that permits species to adjust to a changing world. Whether these changes are natural or caused by human interfere. Each member of any animal or plant species differs widely from other individuals in its genetic makeup because of the large number of combinations possible in the genes that give every individual specific characteristic. The more variation there is the better chance that at least some of the individuals will have an allelic variant that is suited for the new environment & the genetic variability is also essential for a healthy breeding population of a species. If the number of breeding individual is reduced, the dissimilarity of genetic makeup is reduced and inbreeding occurs. Eventually this can lead to extinction of the species. The diversity in wild species forms the gene pool from which our crops and domestic animals have been developed over thousands of years, and newer varieties of crop plants & domestic animals are produced by using the wild type varieties. Modern biotechnology manipulates genes for developing better types of medicines and variety of industrial products. There is a delicate interdependence between biological and genetic diversity changes in biodiversity results in changes in the environment, requiring subsequent adaptation of the remaining species.

2. Species diversity:

Species diversity constitutes the number of species of plants and animals present in a region. Species diversity is a measure of the diversity within an ecological community that incorporates both species richness (number of species in a community) and evenness of species abundance. This diversity is seen in natural or man engineered ecosystems some areas are more rich in species than the others for example Natural undisturbed tropical forests have a greater species richness than plantations developed by the forest department for timber production, thus the value of natural forest for species richness is more than plantations. Species diversity is one component of the concept of biodiversity and is influenced by species richness communities with more species are considered to be more diverse. For example a community containing 10 species would be more diverse than a community with 5 species. Species diversity also influenced by the relative abundance of individuals in the species found in a community.

3. Ecosystem diversity :

It is also known as Ecological diversity Ecological diversity is the variety of biological communities, as forests, deserts grasslands and streams that interact with each other and with their Physical and Chemical environments. Ecosystem diversity can be described for a specific geographical region or political entity as country State, District, Taluka, small village or any small pond. Ecosystem includes natural ecosystems as forests, grasslands, deserts seas, rives or manmade ecosystems as crop field, dams, lakes etc.

B) Value of Biodiversity

At global, regional and local levels the environmental services from species and ecosystems are essential. The reduction of carbon dioxide & production of oxygen, to maintain the water cycle, to protect the soil are important services. It is now well known fact that loss of biodiversity is the cause of environmental climate change. Forests are being lost day by day which is coupled with increasing carbon dioxide level in environment and decrease in oxygen level because the forests convert CO2 to O2. Industrialization on increase the release of carbon dioxide and other gases & contributes to green house effect global warming is warming, the ice caps converting ice in to liquid form, which is resulting in rise in sea level which is submerging the law lying areas under sea water. The environmental temperature is also increasing. Some areas of world are facing with serious droughts & some areas are facing floods. The biodiversity is also important to preserve the ecological processes as fixing & recycling of nutrients, soil formation, circulation of water & air, watershed protection, erosion control etc.

1. Consumptive Value

Local forest communities directly utilize timber, food fuel wood, fodder etc. The biodiversity provides forest dwellers their daily needs as food, building material, fodder, medicines and other materials. Forest dwellers know different species of trees their qualities & their different uses. They collect daily the local fruits roots and plant material that they use as food, construction material or medicines. Fisher men depend on fishes and know where & how to catch fish and other edible aquatic animals and plants. Many fishes have the medicine values other aquatic animals & plants are also having good food, medicinal values and also having the economic values.

2. Productive values:-

The biodiversity has a greatest producing value in production of goods & services. The pharmacologist obtain drugs from plants and animals as atropine from belladonna, caffeine from Tea, Coffee cocaine from cocoa, menthol from mint, papaya proteinase from papaya, penicillin from penicillium fungi quinine from yellow cinochrona etc. Biotechnologists uses boorish areas to search for potential genetic properties in plants and animals that can be used to develop better verities of crops & animals, for industries the

biodiversity is a store house from which new products develops. For the better good production the biodiversity plays an important role, as a raw material.

3. Social Values :

The consumptive & productive values biodiversity are closely linked to social concerns in traditional communities. Ecosystem people value biodiversity as a part of their livelihood as well as through cultural and religious sentiments. Cultivators cultivate number of plants varieties & if one variety of plant fails to grow other grows & acts as insurance. Traditional societies require less resource that preserved their biodiversity as a life supporting resources. Modern man has rapidly depleted it even to the extent of leading to the irrecoverable loss due to extinction of several species. Thus, apart from the local use or sale of products of biodiversity, there is a social aspect in which more and more resources are used by different societies.

4. Ethical values

Each species is unique and has a right to exist. Each species is worthily of respect regardless of its worth to human beings. Ethical values related to conserve biodiversity based on importance of protection all forms of life.

5. Aesthetic Values :-

Each species & ecosystem adds to the richness and beauty of life on the planet. Once a species becomes extinct it gone forever. A natural ecosystem once destroyed, it is impossible to recreate. The value people attribute to the aesthetic function of nature is partly reflected in the number of people who visit areas of natural beauty. This function near or within a dense human settlement is best seen at Sanjay Gandhi National Park on the outskirts of Bombay, which receives traffic of 15 lakhs visitors every year (Kothari et al 1989).

Knowledge and appreciation of the presence of biodiversity for its own sake is another reason to preserve it. Killing wildlife for food is less important than to attract tourist. Biodiversity is a beautiful & wonder aspect of nature, sitting in a forest & listening to birds songs, observe the spider weave, its complex web observe, a fish feeding it is magnificent & fascinating.

6. Economic Values :

The every healthy ecosystem and each species are of potential value to human. Now the global collection of genes, species, habitats, and ecosystems are the resources that are providing human needs, and are also essential for human survival in the future. Humans depend on other species for all of their food and for many medicines and industrial products. In developing countries up to 80 percent of people depend on traditional medicines for primary health care, most of which derived from plants animals & mineral sources. 20,000 species of plants are medicinal nearly about 25 percent of all prescription drugs used in developed world are based on plants including 21 indispensable mainstream drugs, plants contain complex chemical structures which may be impossible to synthesis in laboratory.

Therefore, biodiversity represent a living library of options for adapting to local and global change.

C) BIODIVERSITY OF NATIONAL & LOCAL LEVELS.

India is very rich in all aspects of biodiversity it stands 8th position in biodiversity of plants. Varying Physiographic & climatic conditions at different parts of India are the reason for this high level of biodiversity. India has about 329 million hectare & has almost all kind of ecological zones found in the world it has two of the 34 recognized biodiversity. Hotspots, in the Himalaya & Westerns ghats.

1. The Himalaya

The Himalayan mountain range is important hot spot of India. Stretches over 3000 kilometers of northern Pakistan, Nepal, Bhutan, Northwestern and Northern states of India.

a. Diversity of Plants

In Himalaya about 10,000 species of plants have been reported of which 3160 species & 71 genera are endemic, five plant families Tetracentraceae, Henamelldaceae, Circaestraceae, Butomaceae and stachyuroceae are endemic to this region. Largest family of flowering plants is orchidaceae with 750 species.

b. Diversity of animals :

Nearly 980 species of birds (15-endermic). About 300 mammal species have been recorded in Himalaya (9 dozan endemic), 175 species of reptiles & 105 species of amphibian (50 & 40 endemic respectively), 270 species of fishes (30 endemic). Including cyprinidae 93 species (11 endemics). Baliotozidae 47 species (14-endemic) sisordae 34 species (4-endemic)

Table 1. The vertebrate animal species of Himalaya.

Class	species
Fishes	270
Amphibia	105
Reptiles	175
Birds	980
Mammals	300

2) The Western Ghats :

Western Ghats contain Malabar plains & the chains of mountains running parallel to India's westerns coast (30-50 Km. in land) & covering about 1,60,000 km2 area. The westerns Ghats contains about 5000 species of vascular plants belonging to 2200 genera about 700 species and about 58 genera endemic. In India, 48,000 species of plants are present which belongs about 11% of world flora & 80,000 species of animals belonging about 6.4% of the world's fauna. India's floral diversity includes 17,500 species of angiosperms over 64 species of Gymnosperms 1,022 species of Pteridophytes, 2,843 species of Bryophytes 1,600 species of Lichens 23,000 species of fungi & 2,500 species of Algae (Table-2).The faunal diversity of India includes 5,000 species of Molluscs 60,000 species of Insects, 1,693 species of fishes 205 species of amphibians, 400 species of reptiles 1,200 species of birds & 372 species of mammals (Table 3).

Table 2. Floristic diversity of India.

Group	Number of species
Angiosperms	17,500
Gymnosperms	64
Pteridophytes	1,022
Bryphytes	2,843
Lichens	1,600
Fungi	23,000
Algae	2,500

Table 3. Faunal diversity of India.

Group	Number of species
Mammals	372
Birds	1,200
Reptiles	420
Amphibians	205
Fish	1,693
Mollusks	5,000
Insects	60,000

(Biodiversity profile of India)

India as a centre of Origin:

India is one of the 12 primary centers of origin of crop plants and domesticated animals. India is homeland of 167 agriculturally important plant species and also India is home of 114 breeds of domesticated animals.

A species found in a particular region and not present anywhere in the world is said to be endemic to that region & the unique phenomenon is called endemism. India biodiversity is rich is

endemism. Nearly about 4900 species of flowering plants are endemic to India. About 3% of Indian flora and 62 % of India fauna are endemic. (Supriya Chakraborthy – 2004).

A) Biodiversity Conservation Strategies:

1. In-situ (on-site) conservation includes the protection of plants and animals within their natural habitats or in protected areas. Protected areas are land or sea dedicated to protect and maintain biodiversity.

2. Ex-situ (off-site) conservation of plants and animals outside their natural habitats. These include botanical gardens, zoo, gene banks, seek bank, tissue culture and cryopreservation.

B) Biodiversity Consrvation Efforts In India

At international level due to the awareness about the importance of biodiversity several international organizations working for conserving biodiversity since 1970. India has developed awareness in ancient period and rich knowledge on nature. Ancient 5 Criptures are justifying the need survival. Indian emperor Ashok planted different trees on sides of road to provide shade & shelter & be done knowingly or unknowingly great lot in conservation of trees. The "Bishnoi" communities of Rajasthan have projected antelopes as their blood brothers in time immemorial and still today in some remote areas they continue with painting antelope sketches on walls of huts. This revels a good understanding and relationship of man & animals.

The Chipko movement done by the women of Mandal Village of UP was against deforestation. The Narmada Bachao movement was done under leadership of Medha Patkar and Baba Amte. The Bali pal movement took place to protest against the use of fertile soil of Bali pal Region for missile testing. All these movements were primarily for protecting environment are the examples of awareness of Indian peoples for environment & indirectly Biodiversity Conservation.

VI. CONCLUSION

Conservation of Biodiversity, Management of Biodiversity and Sustainable development are inter-related branches focusing on economic growth, social progress, and environmental protection at the same time ecosystem conservation is also essential. Conservation includes the efforts carried out in protected areas such as Community reserves, National parks and in other areas with rich and important biodiversity where conservation is not the main focus. It is in these latter productive landscapes where sustainability is needed most. Sustainable management, Sustainable agriculture and sustainable fisheries of natural resources are the main approaches for preserving these landscapes for long-term economic, social, and ecological benefits.

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