World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 6.129

BIODIVERSITY CONSERVATION

***Dr. Anil. J. Gour**

Associate Professor, Department of Zoology Bar. R.D.I.K and K.D College Badnera Rly. Dist Amravati.

Corresponding Author: Dr. Anil. J. Gour
Associate Professor, Department of Zoology Bar. R.D.I.K and K.D College Badnera Rly. Dist Amravati.

Article Received on 22/06/2022 **Article Revised on 12/07/2022** **Article Accepted on 01/08/2022**

ABSTRACT

Biodiversity refers to the diversity of all kinds of life on Earth, including plants, animals, microorganisms, their genes, and the ecosystems they create. There are three layers of diversity to consider: species diversity, genetic diversity, and ecological diversity. Biodiversity is important in a number of ways, including promoting the aesthetic value of the natural environment, contributing to our material well-being through utilitarian values, and maintaining the integrity of the environment through; maintaining CO2/O2 balance, regulation of biochemical cycles, absorption and breakdown of pollutants and waste materials through decomposition. Determination and regulation of the natural world climate, as well as protection services, such as acting as windbreaks and environmental indicators. Despite the benefits of biodiversity, today's threats to species and ecosystems are at an all-time high, and nearly all of them are the result of human mismanagement of biological resources, which is often exacerbated by misguided economic policies, pollution, and faulty institutions, in addition to climate change. It is critical to protect biodiversity in order to ensure intragenerational and intergenerational equity. Zoological gardens, botanical gardens/arboretums, seed banks, national parks and game reserves are some of the extant biodiversity conservation strategies.

KEYWORDS: Biodiversity, Biosphere, Ecosystem.

INTRODUCTION

The concept of biodiversity (synonyms with biological diversity) has been known to man ever since he began to minutely observe the living being around him. The term biological diversity was used by Robert E. Jenkins and Thomas Lovejoy in 1980. Biodiversity means 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. The most straight forward definition of biodiversity is the variation of life at all levels of biological organization. It includes diversity of forms right from the molecular unit to the individual organism, and then on to the population, community, ecosystem, landscape and biosphere levels. In the simplest sense, biodiversity may be defined as the sum total of species richness, i.e. the number of species of plants, animals and microorganisms occurring in a given region, country, continent of the entire globe.

Broadly speaking, the term biodiversity includes:
• Genetic diversity.
• Species diversity.
• Ecosystem diversity.

Genetic diversity: (Diversity of genes within a species). Genetic diversity refers to the variation of genes among the population and the individuals of the same species. There are about 1.7 million known species of living forms on the earth. Each one stores an immense amount of genetic information. For example, the number of genes is ~35,000 in Homo sapiens. Genetic variation within species constitutes distinct populations of the same species or genetic variation within population or varieties. Genetic variations represent the differences in the sequence of bases in nucleotides, which constitutes the genetic code. Genetic variations are due to gene mutations, and in an organism with sexual reproduction these can spread by crossing-over and recombination. Other kinds of genetic diversity can be seen at all levels of organization, including the amount of DNA per cell, chromosome structure and their number. Genetic diversity provides the raw materials for adaptation to changing environment and for the natural selection to act upon. If a species has more genetic variability, it can adapt better of to the changed environment. The amount of genetic variation is the basis of the evolution of new life forms (speciation). It has a key role in the maintenance of biodiversity at species levels.

Species diversity: This is the variety of species or the living organisms.

Species Richness - This refers to the total count/number of species in a defined area. Various indices are used including the Mangalet index and Menhink index.
Species Abundance - This refers to the relative numbers among species. If all the species have the same equal abundance, this means that the variation is high hence high diversity, however if the one species is represented by 96 individuals, whilst the rest are represented by 1 species each, this is low diversity.
Taxonomic or phylogenetic diversity - This considers the genetic relationships between the different groups of species. The measures are based on analysis, resulting into a hierarchical classification representing the phylogenetic evolution of the taxa concerned.

Ecosystem diversity: (Diversity at the level of community/ecosystem). In an ecosystem there may exist different landforms, each of which supports different but specific vegetations. Ecosystem diversity in contrast to genetic and specific diversity is difficult to assess quantitatively since the boundaries of the communities, which constitute the various sub-ecosystems are elusive. Ecosystem diversity could best understand if one studies the communities in various ecological niches within the given ecosystem; each ecosystem is associated with defined species complexes. These complexes are related to composition and structure of the ecosystem.

Why Should We Conserve Biodiversity?
There are numerous reasons for this, some of which are obvious and others which are less so, but all of which are equally significant. They are classified as strictly utilitarian, generally utilitarian, or ethical. The narrowly utilitarian justifications for biodiversity conservation are self-evident; humans benefit directly from nature food (cereals, pulses, fruits), firewood, fiber, construction material, industrial products (tannins, lubricants, dyes, resins, fragrances), and medical medicines. Plants are responsible for more than a quarter of all pharmaceuticals currently on the market, and 25,000 species of plants contribute to the traditional medicines utilized by indigenous peoples all over the world. Nobody knows how many more medicinally helpful plants are yet to be discovered in tropical rain forests. With more money being poured into 'bioprospecting' (the study of molecular, genetic, and other biological processes), nations endowed with rich biodiversity can expect to reap enormous benefits. The broadly utilitarian argument says that biodiversity plays a major role in many ecosystem services that nature provides. The fast-dwindling Amazon Forest is estimated to produce, through photosynthesis, 20 per cent of the total oxygen in the earth's atmosphere. Can we put an economic value on this service by nature? You can get some idea by finding out how much your neighborhood hospital spends on a cylinder of oxygen. Pollination (without which plants cannot give us fruits or seeds) is another service, ecosystems provide through pollinators layer – bees, bumblebees, birds and bats. What will be the costs of accomplishing pollination without help from natural pollinators? There are other intangible benefits – that we derive from nature–the aesthetic pleasures of walking through thick woods, watching spring flowers in full bloom or waking up to a bulbul's song in the morning. Can we put a price tag on such things? The ethical argument for conserving biodiversity relates to what we owe to millions of plant, animal and microbe species with whom we share this planet. Philosophically or spiritually, we need to realise that every species has an intrinsic value, even if it may not be of current or any economic value to us. We have a moral duty to care for their well-being and pass on our biological legacy in good order to future generations.

Conservation methods
When we conserve and protect the whole ecosystem, its biodiversity at all levels is protected - we save the entire forest to save the tiger. This approach is called in situ (on site) conservation. However, when there are situations where an animal or plant is endangered or threatened (organisms facing a very high risk of extinction in the wild in the near future) and needs urgent measures to save it from extinction, ex situ (off site) conservation is the desirable approach
It can be conserved in the following ways:

- In-situ Conservation
- Ex-situ Conservation

In-situ conservation
Faced with the conflict between development and conservation, many nations find it unrealistic and economically not feasible to conserve all their biological wealth. Invariably, the number of species waiting to be saved from extinction far exceeds the conservation resources available. On a global basis, this problem has been addressed by eminent conservationists. They identified for maximum protection certain 'biodiversity hotspots' regions with very high levels of species richness and high degree of endemism (that is, species confined to that region and not found anywhere else). Initially 25 biodiversity hotspots were identified but subsequently nine more have been added to the list, bringing the total number of biodiversity hotspots in the world to 34. These hotspots are also regions of accelerated habitat loss. Three of these hotspots – Western Ghats and Sri Lanka, Indo-Burma and Himalaya – cover our country's exceptionally high biodiversity regions. Although all the biodiversity hotspots put together cover less than 2 per cent of the earth's land area, the number of species they collectively harbour is extremely high and strict protection of these hotspots could reduce the ongoing mass extinctions by almost 30 per cent. In India, ecologically unique and biodiversity-rich regions are legally protected as biosphere reserves, national parks and sanctuaries. India now has 14 biosphere reserves, 90 national parks and 448 wildlife sanctuaries. India has also a history of religious and cultural traditions that emphasized protection of nature. In many cultures, tracts of forest were set aside, and all the trees and wildlife within were venerated and given

total protection. Such sacred groves are found in Khasi and Jaintia Hills in Meghalaya, Aravalli Hills of Rajasthan, Western Ghat regions of Karnataka and Maharashtra and the Sarguja, Chanda and Bastar areas of Madhya Pradesh. In Meghalaya, the sacred groves are the last refuges for a large number of rare and threatened plants.

Following are the important advantages of in-situ conservation:

1. It is a cost-effective and convenient method of conserving biodiversity.
2. A large number of living organisms can be conserved simultaneously.
3. Since the organisms are in a natural ecosystem, they can evolve better and can easily adjust to different environmental conditions.

Ex situ conservation

Conserving biodiversity outside the areas where they naturally occur is known as ex situ conservation. Here, animals and plants are reared or cultivated in areas like zoological or botanical parks. Zoological parks, botanical gardens and wildlife safari parks serve this purpose. There are many animals that have become extinct in the wild but continue to be maintained in zoological parks. In recent years ex situ conservation has advanced beyond keeping threatened species in enclosures. Now gametes of threatened species can be preserved in viable and fertile condition for long periods using cryopreservation techniques, eggs can be fertilized in vitro, and plants can be propagated using tissue culture methods. Seeds of different genetic strains of commercially important plants can be kept for long periods in seed banks. Biodiversity knows no political boundaries and its conservation is therefore a collective responsibility of all nations. The historic Convention on Biological Diversity ('The Earth Summit') held in Rio de Janeiro in 1992, called upon all nations to take appropriate measures for conservation of biodiversity and sustainable utilisation of its benefits. In a follow-up, the World Summit on Sustainable Development held in 2002 in Johannesburg, South Africa, 190 countries pledged their commitment to achieve by 2010, a significant reduction in the current rate of biodiversity loss at global, regional and local levels.

Ex-situ conservation has the following advantages:

1. The animals are provided with a longer time and breeding activity.
2. The species bred in captivity can be reintroduced in the wild.
3. Genetic techniques can be used for the preservation of endangered species.

Strategies for Biodiversity Conservation

Following are the important strategies for biodiversity conservation:

1. All the varieties of food, timber plants, livestock, microbes and agricultural animals should be conserved.
2. All the economically important organisms should be identified and conserved.
3. Unique ecosystems should be preserved first.
4. The resources should be utilized efficiently.
5. Poaching and hunting of wild animals should be prevented.
6. The reserves and protected areas should be developed carefully.
7. The levels of pollutants should be reduced in the environment.
8. Deforestation should be strictly prohibited.
9. Environmental laws should be followed strictly.
10. The useful and endangered species of plants and animals should be conserved in their nature as well as artificial habitats.
11. Public awareness should be created regarding biodiversity conservation and its importance.

International biodiversity conventions and conservation organizations

• The Ramsar Convention on Wetlands of international importance.
• International Union for the Conservation of nature (World Conservation Union).
• Convention on International trade for endangered species (CITES).
• International Convention for the Protection on birds.
• International Board for Plant genetic resources.
• World Wide Fund for Nature.
• Convention on Conservation of migratory species of wild animals.
• International Convention for the Regulation of whaling.
• UNESCO program on Man and biosphere.

Abbreviations used

UNESCO - United Nations Educational, Scientific and Cultural Organization.

REFERENCES

1. Spellerberg, I.F., and Hardes, S.R., 1992: Biological conservation. Cambridge University Press, 123 pp.
2. Botanical Survey of India (BSI) report (2006). Plant Biodiversity in India.
3. Agrawal, K. C. (2009). Biodiversity: Concept, Conservation and Management. ISBN: 81-89153-
4. Agrawal, K. C. (2009). Biodiversity: Concept, Conservation and Management. ISBN: 81-89153-
5. Ahluwalia, V. K.; Malhotra, S. (2008). Environmental Science. ISBN-13: 978-1-42007-069-9.
6. Agrawal, K. C. (2009). Biodiversity: Concept, Conservation and Management. ISBN: 81-89153-05-6.
7. Botanical Survey of India (BSI) report (2006). Plant Biodiversity in India.
8. Joshi, B. D.; Tripathi, C. P. M. and Joshi, P. C. (2008). Biodiversity and Environment

9. Joshi, B. D.; Tripathi, C. P. M. and Joshi, P. C. (2008). Biodiversity and Environment
10. ENVIS. Environmental Information system. www.envis.nic.in
11. Nora Bynum (2008) What is biodiversity? Rice University, Houston, Texas
12. M. Jnr. Hunter. 2002. Fundamentals of Conservation Biology. Second Edition. Blackwell Science, Massachusetts, U.S.A.