JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Biodiversity Conservation and Management: A Review

Dr. Archana Mantale
Department of Zoology, Shri Muktanand College, Gangapur, Chhatrapati Sambhajinagar (M.S.) India
(E-mail: archana.virkar2812@gmail.com)

Abstract: Biodiversity is a measure of variation at the genetic, species and ecosystem levels. It encompasses the variety of life forms in a given ecosystem, including the diversity of species, the genetic variation within these species and the diversity of the ecosystems themselves. Human activities include the overexploitation of natural resources and have a negative impact on ecosystems through deforestation and pollution. Climate change can also have a negative impact on biodiversity in the short and long term. Conservation of Biodiversity is important for maintaining the health and stability of ecosystems and for the well-being of people, as it depends on the diversity of species. It ensures the resilience of ecosystems to environmental changes and disturbances, allowing them to provide essential services such as clean air, water and fertile soils. Biodiversity conservation includes the protection, management and restoration of biodiversity. It includes the creation of national parks, wildlife sanctuaries, etc. Biodiversity It should be conserved because it provides us with economic and aesthetic benefits. In this article, we focus on the definition of biodiversity conservation, conservation methods and reasons why it should be conserved. This article provides a brief overview of research activities on biodiversity and its conservation.

Index Terms **- Biodiversity Conservation, Ecosystem, Management**

I. INTRODUCTION

Biodiversity

On Earth, biodiversity is unevenly distributed. It is the richest in the tropics. The equator tends to have the greatest terrestrial biodiversity (Gaston, 2000), which seems to be a consequence of the warm temperature and high primary productivity (Field et al., 2009). The mid-latitudinal band in all seas has latitudinal gradients in species diversity (Tittensor et al., 2010) and the Western Pacific, where sea surface temperature is highest, has the greatest marine biodiversity along coasts. Generally, biodiversity tends to concentrate in hotspots (Myers et al., 2000) and has been rising over time (McPeeket et al., 2007), although it is likely that this trend will abate in the future (Robosky, 2009).

The word bio means life and diversity means variability, so the variation between all living creatures found on earth from entire sources containing marine, terrestrial and water ecosystem is known as biodiversity (Agarwal & Singh, 2018). Biodiversity is the variety and variability of life on Earth. It includes plants, animals and microorganisms. All the different forms of flora and fauna that exist on our planet are collectively called Earth's Biodiversity. The simplest definition of biodiversity is the variation of life at all levels of biological organisation (Antonelli et al. 2018). The term biodiversity generally includes Genetic diversity, Species and Ecosystem diversity (Chandrakar, 2012). Biodiversity is not evenly distributed; it varies considerably around the world, as well as between regions and seasons. The diversity of all living things (biota) depends on temperature, precipitation, altitude, soil, geography, and interactions with other species. Biodiversity is of fundamental importance. Many consider it to have intrinsic value: every species has value and a right to exist, regardless of whether it is known to be valuable to humans or not. Extinction is a natural process. The geological record shows that hundreds of plant and animal species have become extinct over the centuries because they failed to adapt to changing conditions due to geological events such as continental drift, massive volcanic eruptions, or asteroid impacts. Today, humans are the most powerful agents of environmental change, driving the latest wave of extinctions. Human activities have led to the destruction of more than a third of the world's forests. Increasing human demand for natural resources is causing genes, species and habitats to disappear at an unprecedented rate. Human activities responsible for increasing industrialization and urbanization lead to pollution, erosion and other factors of environmental degradation. This has a negative impact on biodiversity and ecosystems, and results in the loss of species or the diversity of a species in its natural habitat. This depletion affects the food chain of the ecosystem and the resilience to natural disasters is hampered, plant production is reduced and

changes in ecosystem processes are becoming more common. As a result, 12%, 23% and 32% of all bird, mammal and amphibian species in the world are listed in the category of endangered species, respectively.

The manner in which ecosystems operate and the services they offer are significantly influenced by biodiversity. By aiding in the lo ngterm sequestration of carbon across avariety of biomes, biodiversity significantly reduces the effects of climate change. The sequential balance of CO_2 and O_2 is maintained through biodiversity. The planet is becoming warmer and more vulnerable to natural disasters as a result of the build-up of CO_2 in the atmosphere and the depletion of the ozone layer.

Biodiversity Conservation

It can be defined as the practice of protecting, managing and restoring biodiversity for the sustainable use of resources. The term biodiversity is derived from "biological diversity", which refers to the different forms of life that exist on Earth at different levels, from genes to entire ecosystems. The reasons for the loss of biodiversity are numerous, including rapid industrialization, urbanization, deforestation, inappropriate and unsustainable use of land and resources. In addition to these activities, others directly target flora and fauna, such as the destruction and construction of sensitive biodiversity areas, the failure to protect endemic areas, the illegal hunting and poaching of certain animals, such as elephants, for the production of ivory jewellery and sea turtles, which are eaten as delicacies and used for medicinal purposes in many cultures. Biodiversity conservation should not be limited to trying to save a single species, as this would be futile; instead, we should focus on protecting the habitat and ecosystems of these species so that they can thrive. Biodiversity conservation is considered a key element of natural resource management. Biodiversity is a global concept that describes the extent of ecological diversity. Protected areas such as National Parks, Zoological Parks and wildlife sanctuaries provide refuge for different species, protecting them from extinction.

Importance of Biodiversity Conservation

The conservation of biodiversity is important for maintaining the health and stability of ecosystems and for the well-being of populations, because it depends on the diversity of species. It ensures the resilience of ecosystems to environmental changes and disturbances, allowing them to provide essential services such as clean air, water and fertile soils. Biodiversity conservation includes the protection, management and restoration of biodiversity. It should be conserved because it provides us with economic and aesthetic benefits. Since 1970, the human population has doubled while the biodiversity of flora and fauna continues to decline at an alarming rate, so much so that scientists have warned that a new mass extinction could occur. The preservation of biodiversity of all kinds is very important because without it the entire life system will collapse. The importance of species conservation can be understood from the fact that if a habitat is lost, even for one species, then the entire ecosystem is affected because the food chain is broken and this will affect not only the nearby flora and fauna, but also humans, because we too are part of the food chain. Therefore, the conservation of biodiversity must be a priority.

Biodiversity and Human Health

People depend on biodiversity in their daily lives, in ways that are not always visible or appreciated. Human health ultimately depends on the products and services of ecosystems (such as the availability of fresh water, food and fuel sources) that are necessary for good human health and productive livelihoods. Biodiversity loss can have a significant direct impact on human health, if ecosystem services are no longer sufficient to meet social needs. Indirectly, changes in ecosystem services affect livelihoods, incomes, local migration and, at times, can cause or exacerbate political conflicts. In addition, the biological diversity of microorganisms, flora and fauna offers many benefits for the biological, health and pharmacological sciences. Important medical and pharmacological discoveries are made through a better understanding of the Earth's biodiversity. The loss of biodiversity can limit the discovery of potential treatments for many diseases and health conditions.

Methods of Biodiversity Conservation

For a more sustainable environment, a balanced diversity between different species plays an important role. Humans depend heavily on different species in one form or another to meet our needs. Due to this fact and the associated ethical and economic benefits, it is necessary to protect biodiversity. There are two different methods to conservation biodiversity. They are explained below:

***a) In-situ* conservation**

It involves the conservation and protection of species in their natural habitat, that is, in their natural environment. The in situ approach consists of protecting a group of typical ecosystems or regions with high biodiversity through a network of protected areas. These are terrestrial or marine areas intended solely for the protection of biological diversity and the resources associated with them. This is the most convenient method since species are conserved in their natural habitats. It includes national parks, wildlife sanctuaries, sacred forests, genetic sanctuaries and biosphere reserves.

Such an approach has the following advantages:

• Economical and profitable, it conserves natural habitat and species.
• It protects a large part of the population at the same time.
• Species can easily adapt to the environment because they are found in a natural ecosystem.
In India, regions rich in biodiversity have been given legal protection and declared under the categories of biosphere reserves, wildlife sanctuaries and national parks.

***b) Ex-situ* conservation**

Ex situ or "out of place" conservation refers to the protection of elements of biodiversity outside their natural habitat. In this case, there is a cessation to evolutionary progress, but the desired genes will be preserved. This conservation strategy plays an important role in the recovery of endangered species. It is especially useful in the field of agriculture, because domesticated plants that cannot survive in the wild without help can be preserved using various ex situ techniques. It includes the protection of endangered species in artificial ecosystems, including zoos, botanical gardens and nurseries. As a result, a less competitive environment is created in terms of food, space and water availability.
The advantages of this method are as follows:
• Genetic strategies, such as preserving seeds of important plants for long periods, can be easily adopted.
• Cryopreservation techniques can be practiced to preserve gametes of endangered species.
• Plant propagation can be done using tissue culture techniques.
In situ and ex situ conservation of biodiversity are two approaches to biodiversity conservation. In situ conservation focuses primarily on protecting the organism in its natural habitat while ex situ conservation focuses primarily on protecting the organism by relocating it to an ideal protective habitat.

Biodiversity Conservation Strategies

• Development and maintenance of protected areas such as national parks, sanctuaries to protect threatened and critical species.
• All vulnerable animals should be identified and protected.
• Efficient use of resources.
• Focus on reforestation, wetland restoration and other habitat rehabilitation efforts.
• Hunting and poaching of wild animals should be avoided.
• Sustainable agricultural practices must be followed.
• Local communities can be involved in conservation efforts.
• Raise awareness of the importance of biodiversity conservation.
Biological diversity is the essential foundation of a healthy, living and sustainable planet, but the growth of exploitation combined with natural disasters has led to the rapid decline of important species. Many organisms are threatened with extinction or extinction due to natural and anthropogenic reasons. Approximately 60,000 to 100,000 species with various economic uses are threatened with extinction and require protection. This requires urgent action to conserve biodiversity at the ecosystem, species and gene levels, and to enable sustainable use for current and future generations. Conservation refers to the protection, preservation, management and restoration of landscapes, ecosystems and species.

CONCLUSIONS:

Biodiversity is complex and interconnected, and its effects on productivity and stability vary based on different time frames and environments. It's clear that biodiversity is vital for both natural and managed ecosystems. For legislatures to maintain current levels of diversity, a solid understanding of the science is necessary. Without changes in human growth and resource management, many important species may be lost, and ecosystems may not recover. The article discusses various conservation efforts by governments, volunteer groups, and individuals, emphasizing the importance of compassionate treatment of all life forms. Everyone can play a role in protecting biodiversity.

Data Availability
Data used in this context are taken from published research work.
Conflict of Interest
The author declares there is no conflict.

Funding Source
For this review article author did not receive grant from any funding agency.
Authors' Contributions
Author did literature survey and edited the final precise review article.
Acknowledgements
The author is immensely grateful to the Department of Zoology, Shri Muktanand College, Gangapur, Dist. Chhatrapati Sambhajinagar for providing library facility and infrastructure for preparation of this review.

REFERENCES

[1] Agarwal, A., and Singh, J. 2018. "Biodiversity Conservation in India: A Review". G-Journal of Environmental Science and Technology, 6(1), 1-4.
[2] Antonelli, A., Kissling, W. D., Flantua, S. G., Bermúdez, M. A., Mulch, A., Muellner-Riehl, A. N., Kreft, H., Linder, H. P., Badgley, C., Fjeldså, J. and Fritz, S. A., 2018. Geological and climatic influences on mountain biodiversity. Nature Geoscience, 11(10), 718-725.
[3] Chandrakar, A. K. 2012. "Biodiversity conservation in India, Technical Report" DOI: 10.13140/ RG.2.1.1490.3208.
[4] Convention on International Trade in Endangered Species of Wild Fauna and For a (CITES)
[5] ENVIS. Environmental Information system. www.envis.nic.in
[6] Field, R., Hawkins, B. A., Cornell, H.V., Currie, D.J., Diniz Filho, J., Alexandre, F., Guégan, Jean-François; Kaufman, D.M., Kerr, J.T., Mittelbach, G.G., Oberdorff, T., O'Brien, E. M. and Turner, J. R. G., 2009. Spatial species-richness gradients across scales: a meta-analysis. Journal of Biogeography, 36 (1): 132 147. doi:10.1111/j.1365-2699. 2008. 01963.x.
[7] Gaston, K.J., 2000. Global biodiversity. Nature, 405 (6783): patterns in 220–227. doi:10.1038/35012228. PMID 10821282.
[8] McPeek, M.A. and Brown, J.M., 2007. Clade Age and Not Diversification Rate Explains Species Richness among Animal Taxa. The American Naturalist, 169 (4): E97 E106. doi:10.1086/512135. PMID 17427118
[9] Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B., Kent, J., Mittermeier, C. G., Da Fonseca, G. A. B. and Kent, J., 2000. Biodiversity hotspots for conservation priorities. Nature, 403 (6772): 853–858. Bibcode:2000 Natur.403..853M. 35002501. PMID 10706275. doi:10.1038/
[10] National Biodiversity Action Plan (2008). Government of India. Ministry of Environment and Forests.
[11] Rabosky, D.L., 2009. Ecological limits and diversification rate: alternative paradigms to explain the variation in species richness among clades and regions. Ecology Letters, 12 (8): 735–743. doi:10.1111/j.1461 0248.2009.01333.x. PMID 19558515.
[12] The Convention on Biological Diversity (CBD) www.cbd.int
[13] Tittensor, D. P., Mora, C., Jetz, W., Lotze, H. K., Ricard, D., Berghe, E., Vanden Worm, B., Jetz, W., Lotze, H. K., Ricard, D., Berghe, E. V., Worm, B., 2010. Global patterns and predictors of marine biodiversity across taxa. Nature, 466 (7310):1098–1101. Bibcode: 2010Natur.466.1098T. 10.1038/nature09329.PMID 20668450. doi :
[14] UNESCO report (2005). World Network of Biosphere Reserves.
[15] Wildlife (Protection) Act (1972). www.moef.nic.in/legis/wildlife/wildlife1_html
[16] Wildlife Institute of India (WII). www.wii.gov.in
[17] www.cites.org
.