# BIODIVERSITY AND ITS CONSERVATION

**C.U Registration Number:**

**115-1211-0517-20**

**C.U Roll Number: 203115-11-0068**

**College: Surendranath College**

**College Code: 115**

**Semester : II, Statistics Honours**

**Subject of Submission : ENVS**

**Topic:**

**Biodiversity and its conservation.**

# INTRODUCTION

For much of the time man lived in a hunter-gather society and thus depended entirely on biodiversity for sustenance. But, with the increased dependence on agriculture and industrialization, the emphasis on biodiversity has decreased. Indeed, the biodiversity, in wild and domesticated forms, is the source for most of humanity, food, medicine, clothing and housing, much of the cultural diversity and most of the intellectual and spiritual inspiration. It is, without doubt, the very basis of life. Further that, a quarter of the earth's total biological diversity amounting to 1.7 million species, which might be useful to mankind in one way or other, would be in serious risk of existence over the next 2-3 decades. On realization that the erosion of biodiversity may threaten the very existence of life has awakened man to take steps to conserve it. In this project, we will have an overview on the biodiversity of India, its importance and the various approaches for its conservation.

# WHAT IS BIODIVERSITY ?

The concept of biodiversity (synonym with biological diversity) has been known to man ever since he began to minutely observe the living being around him. 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 and habit diversity.

# TYPES OF BIODIVERSITY :

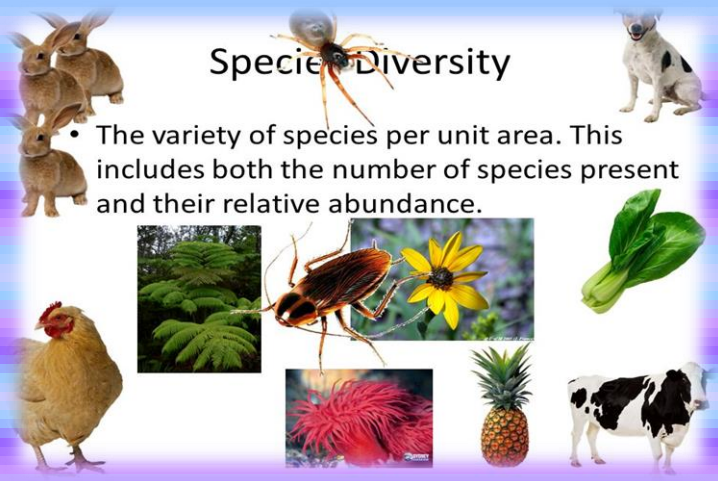
## ***GENETIC BIODIVERSITY*** *(Diversity of genes within a species):*

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*.


## ***SPECIES BIODIVERSITY*** *(Diversity among species):*

It refers to the variety of species within a region, i.e. the number of species per unit area at the site (species richness). An estimated 1.7 million species have been described to date. Species are the primary focus of evolutionary mechanisms and therefore the origin and evolution of species are principle agents in maintenance of global biodiversity.

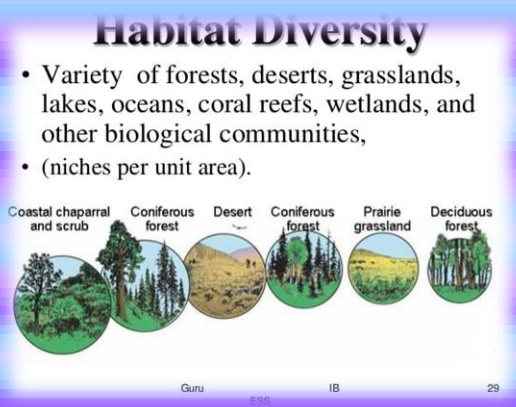


## ***ECOSYSTEM BIODIVERSITY*** *(Diversity at the level of community/ecosystem):*

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 understood 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.

## ***HABITAT BIODIVERSITY:***

It involves more than just the kind of communities and species- it depends on the spatial arrangement of habitats across a large and on the fluxes of energy, nutrients, disturbances and organisms across the area.



# THREATS TO BIODIVERSITY:

- **Extinct** species that are no longer known to exist in the wild. Searches of localities where they were once found and of other possible sites have failed to detect the species.

- **Endangered** species that have a high likelihood of going extinct in the near future.

- **Vulnerable** species that may become endangered in the near future because populations of the species are decreasing in size throughout its range.

- **Rare** species that have small total numbers of individuals often due to limited geographical ranges or low population densities.

- **Insufficiently known** species that probably belong to one of the conservation categories but are not sufficiently well known to be assigned to a specific category.

# CONSERVATION OF BIODIVERSITY:

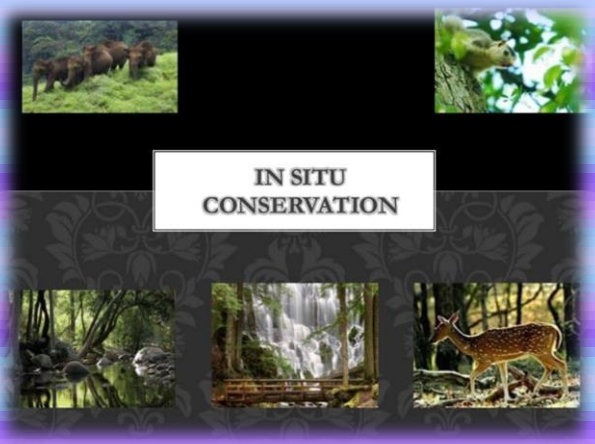
We must make every effort to preserve, conserve and manage biodiversity. Protected areas, from large wilderness reserves to small sites for particular species and reserves for controlled uses, will all be part of this process. Protected areas are legally established sites managed for conservation of biodiversity. Worldwide about 8,163 protected areas cover over 750 million hectares of marine and terrestrial ecosystems, amounting to 1.5 percent of Earth's surface.

India is the second most populous country, and therefore any plan attempting at conservation must consider socio-economic development as the mounting human pressure threatens the biotic resources of the country. Furthermore, ours is predominantly an agriculture country, and hence, policy makers should realize that conservation and sustainable utilization of biodiversity is the key to all developmental planning projects.

# METHODS OF CONSERVATION:

## In-situ conservation:-

*In situ* conservation means the conservation of ecosystem and natural habitat and maintenance and recovery of viable population of species in the natural surrounding where they have developed their distinctive characteristics. The main objective is to recognize a particular biodiversity rich area and to preserve it so that the biodiversity can continue to flourish and evolve. This involves establishment of protected areas, national parks, sanctuaries, biosphere reserves, reserve forests etc. over past few decades there has been an increase in the number of such areas. *In situ* conservation of biodiversity is advantageous in that it is a cheap and convenient method that requires people's our supportive role. It maintains all organisms at different trophic levels from producers to top consumers such as carnivores. In natural environment, organisms not only live and multiply but also evolve and continue to maintain their ability to resist various environmental tresses such as drought storm, snow, temperature fluctuations, excessive rains, flood, fires, pathogens etc. The only disadvantage of *in situ* conservation is that it requires larger areas and minimizes the space for inhibiting human population which is increasing tremendously. The following areas may be set aside for *in situ* conservation:


## ➢ National Parks:

National Park is an area of land set aside to conserve the scenery (or environment) and natural objects and the wildlife therein. All kinds of destruction, exploitation and removal of wildlife and damage to the habitat of any animal are strictly prohibited inside a National park. Grazing of domestic animals is also prohibited. However, the Chief Wildlife Warden may, after prior approval of the state government, permit destruction, exploitation and removal of wildlife from the NP if necessary for the improvement and better management of wildlife therein.

## ➢ Wildlife Sanctuaries:

Similar to the National park, a wildlife sanctuary is dedicated to protect wildlife, but it considers the conservation of species only and also the boundary of it is not limited by state legislation. As per provision of the Wildlife (Protection) Act of 1972 no person shall destroy, exploit or remove any wildlife from a sanctuary, or destroy or damage the habitat of any wild animal or deprive any wild animal from its habitat, except the permission granted by Chief Wildlife Warden, after prior approval of the state government. The permanent residents of the area are bound to perform certain duties such as helping in controlling fire damage, to report about dead animals and render all kinds of help in resisting the offenders.


## ➢ Conservation Reserves:

Conservation Reserves can be declared by the State Governments in any area owned by the Government, particularly the areas adjacent to National Parks and Sanctuaries and those areas which link one Protected Area with another. Such declaration should be made after having consultations with the local communities. Conservation Reserves are declared for the purpose of protecting landscapes, seascapes, flora and fauna and their habitat. The rights of people living inside a Conservation Reserve are not affected.

## CONSERVATION AND COMMUNITY RESERVES

**Conservation and community reserves**

- These are ecological value and can act as migration corridors, or buffer zone.
- Conservation reserves are designated government owned land from where communities may earn a subsistence, while community reserves are on mixed government/private lands.
- Community reserves are the only privately held land accorded protection by the government of India.

## ➢ WETLANDS:

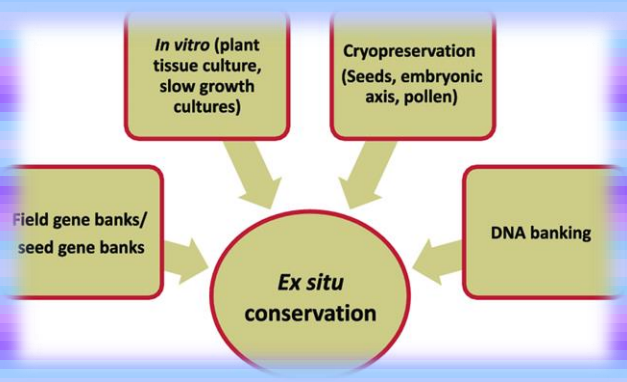
National Wetland Committee was constituted in 1989. The committee in the same year identified 16 wetlands, which need conservation measures. . This includes 25 wetlands in the country which needs protection. Recently in September 2012, Nalsarovar in Gujrat added into this list as 26$^{th}$ Ramsar site.

## ➢ MANGROVES AND CORAL REEFS:

The National Environmental Policy, 2006 recognizes that mangroves and coral reefs are important coastal environmental resources. They provide habits for marine species, protection from extreme weather events, and a resource base sustainable tourism. West Bengal has maximum of mangrove cover in the country followed by Gujarat and Andman & Nicobar Island. MoEF has established a National Mangrove Genetic Resources Centre in Orissa.

# Ex-situ conservation:-

Ex situ conservation means the conservation of biological diversity components outside their natural habitat. It involves cultivation of rare plants/rearing of threatened animals outside of their natural habitats and also holding of plants and animal species in botanical and zoological gardens, and in arboretums or store them in the form of seeds in seed bank (gene banks) or some other suitable forms by means of tissue cultures techniques. There are a number of tissue cultures techniques. There are a number of plant and animal species, which have become more or less extinct in the wild, but they are being conserved in gardens or zoos, e.g. cheetah (Acinonyx jubatus).

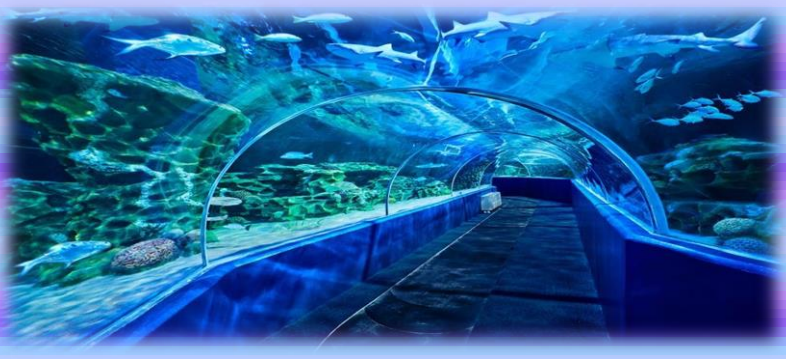



## ➢ ZOOLOGICAL PARKS :

There are roughly 5,00,000 mammals, birds, reptiles and amphibians in captivity in zoos throughout the world. Zoos contribute in many ways to the conservation of biodiversity. Zoo populations are now the only representatives of several species including the California conder (Gymnogypus californianus) and possibly the Black-footed ferret (Mustela nigripes) and at least 18 species have been reintroduced into the wild after captive propagation.


## ➢ AQUARIA:

The role of aquaria in the captive propagation of threatened freshwater species is significant. Accordingly, the captive Breeding Specialist Group of the World Conservation Union (IUCN) is mounting a major effort to develop captive breeding programmes for endangered fish species, starting from the lake Victoria, the desert fishes of North America, and Appalachian stream fishes. The programme shall also include the restoration of natural habitats, provides protection against loss of wild restoration of natural habitats, provides protection against loss of wild species and help educate the public on threats to fishes.

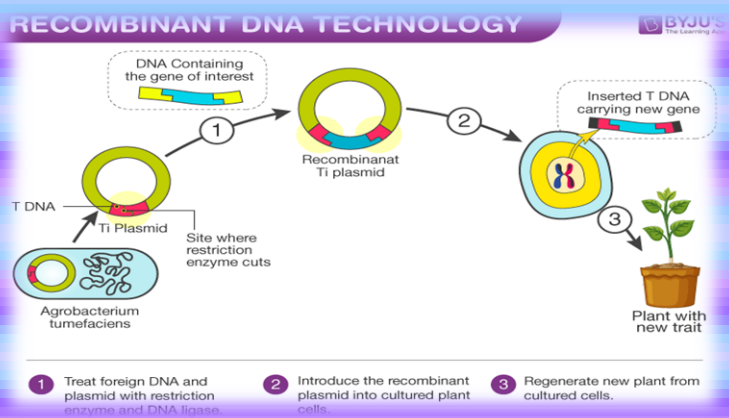


# ➢ BOTANICAL GARDENS:

There are more than 2000 botanical gardens in over 150 countries; together they maintain 6 million accessions in their living collections and 142 million herbaria specimens. The contribution of botanical gardens to the conservation of species extends beyond the preservation of species threatened in wild. Botanical gardens supply plants for research and horticulture, thereby reducing pressure on wild population. Also, they are important education resources.

# ➢ RECOMBINANT DNA TECHNOLOGY:

The recombinant DNA technology allows us to clone any DNA in Escherichia coli, and soon it will hopefully be possible to extend such cloning to yeast and other organisms. Cloned DNA, therefore, appears to be an attractive candidate for genetic conservation. In addition to cloned genes, the entire genomic DNA of plant population can be preserved. Recombinant DNA technology has still another novel advantage in that it can make use of genes of plant material that has lost viability. From DNA libraries of such material, a relevant gene or gene combination can be retrieved and put to use.



# CONCLUSION

It is imperative that the phenomenon of biodiversity is very vast, complex and interdependent and there is no single over-arching effect of diversity on either productivity or stability. The realized effects will depend heavily on environmental context and the time scale over which the effects are studied. However, it has become obvious that biodiversity is indeed important for both managed and natural ecosystems, though the relative contributions of diversity and composition remain unclear. It is therefore necessary for legislators to understand the basic science in order to maintain diversity at its current levels. If current human growth and resource management patterns do not change, it is likely that we will lose many important species, and the ecosystems of the world may never recover. In present paper the various conservation strategies by government, voluntary organizations, public participation as well as the individual efforts have been discussed, that how they commutatively plays a major role for the conservation of the biodiversity.Human is only one more of natural creatures and should not be alien to the other life-forms. We have no moral right to destroy nature and other beings that dwell on earth. We should treat all animals and plants with compassion. Every individual can make a small and yet significant effort in the race to save our planet and conserve biodiversity.

# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to our respected professor, Mrs. Champa Chakraborty as well as our respected Principal Sir, Dr. Indranil Kar, who gave me the golden opportunity to do this wonderful project entitled ‘Biodiversity and its Conservation’. It helped me in doing a lot of research and enhance my knowledge and skills. Secondly, I would like to thank my parents and friends for providing me with constant support and guidance.

I am really thankful to all of them.

# BIBLIOGRAPHY:

For doing this project, I have collected data from the following websites listed below :

- **www.nationalgeographic.org**
- **www.wikipedia.org**
- **www.britannica.com**

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