World Journal of Pharmaceutical research

Volume 2, Issue 5, 1817-1825. Review Article ISSN 2277 – 7105

BIODIVRESITY CONSERVATION AND CHALLENGES TO IT

Veena Joshi*

*Associate Professor.Department of Chemistry,H.N.B .Garhwal University, S.R.T.Campus ,Badshahi Thaul, 249199,Tehri Garhwal. India

Article Received on
16 June 2013,

Revised on 24 July 2013,
Accepted on 30 August 2013

***Correspondence for Author:**

Dr Veena Joshi,
Associate Professor.
Department of Chemistry,
H.N.B .Garhwal University,
S.R.T.Campus ,Badshahi
Thaul, 249199,Tehri Garhwal.
India
joshiveena16@gmail.com

ABSTRACT

Biodiversity conservation is mainly concerned with the conservation of fauna and flora with genetic diversity. Due to habitat destruction, climate change and many other factors we are loosing our natural wealth in a speedy way and some of the species are facing the challenges of extinction. This article is focusing on some of the factors responsible for degradation of biodiversity.

Key Words: Biodiversity, climate, species.

INTRODUCTION

India is a country with colourful cultural and natural heritage. It is sixth on a list of 12 mega biodiversity countries in the world, Western Ghats and North East India are the two biodiversity hot-spots in India on a list of 13 biodiversity hot-spots of the world. India is a country having about 10% of the world's biodiversity wealth, distributed into 16 agro climatic zones. Out of 17,000 species of higher plants reported to occur in India, 7500 are known to have medicinal value. Ayurveda the oldest medicinal system of India has reported approximately 2000 plant species with medicinal potential. The *Charak Samhita*, an age old written document on herbal therapy reports on the production of 340 herbal drugs for curing various diseases. The officially documented plant species with medicinal potential are near about 3000. India is the largest producer of medicinal herbs and is called the botanical garden of the world.

India possesses a distinct identity due to its varied and diverse ecosystem. The type of Indian flora ranges from evergreen tropical rain forests to the dry desert forests. The variety of living

beings is the essential element which makes the world a beautiful and exciting place to live. Mainly three types of biodiversity are essential to preserve an ecological system.

- **Genetic diversity:** It is a measure of the variety of the versions of the same genes within individual species
- **Species diversity:** It describes the number of different kinds of organisms within individual ecosystem.
- **Biological diversity**: It means the richness of a biological community. There is a variety of life on earth with genetic diversity within the species, diversity of habitat, ecosystem and biomes, and climatic change.
- According to the Red list of Threatened species in India 18 species of Indian fauna are critically endangered ,54 endangered and 143 are vulnerable ,In case of flora 44 plant species are critically endangered ,113 endangered and 87 vulnerable . the major cause of extinction of species are, loss and degrasation habitat .
- Climate change is also one major cause for the biodiversity destruction and the speed of it is likely to accelerate in the next 50 years and with this the habitat destruction will continue to accelerate, and by the end of the century climatic change will be the main cause for biodiversity destruction.
- Anthropogenic and green house gases have a great impact on the species, in the polar region number of polar bears are declining because the sea ice, they depend on for hunting seals, is melting with a rapid rate of 9% per decade . In Southern pole many penguin species are at great risk because water is under going unusual warming that disrupts the fish and invertebrate species the penguin live on. The continuous rise in the land temperature with increasing human population is encouraging the spread of diseases, like malaria, dengue, bird flu and swine flu. Some of these are pathogens for both human and wild life.
- The higher estimate of the total number of species on earth are based on recent work in tropical rain forests, which hold more living species than all other habitats, Costa Rica less than half the size of New York State is estimated to contain at least 5% of all living species, Western Ghats in India are also the hot spot of biodiversity.
- An experiment was carried out in UK to show that what are the impact of increasing species on biodiversity, researchers added various plants, insects and worms to replicate in specified plots in enclosed chambers and they found that more species they added to a

plot the more biomass that plot produced and thus greater was the productivity of that plot, so in a nut shell species are important for growth of the universe.

BENEFITS OF BIODIVERSITY

- We are benefited by other organisms in many ways. Many wild plant species could make important contribution to human food supply a tropical ecologist Norman Myres estimates that near about 80,000 edible wild plant species are utilized by humans. Villagers of Indonesia are thought to use some 4,000 native plant and animal species as food, medicine and for other uses.

SOURCE FOR MEDICINE

- Earths genetic bank also serves as medicine. For many years the native people of Madagascar used an obscure plant, the rosy peri-winkle, in their folk medicine. Two anticancer alkaloids are extracted from this plant. The drug derived from this plant is very helpful in curing childhood leukemia which was a fatal disease in children before these drugs were introduced.
- An extract from the bark of the pacific yew is a potent drug for the treatment of ovarian, breast and small cell cancers. Taxol is the most prescribed antitumor drug extracted from the bark of pacific yew. According to a report of WHO, 80% of the world's people depend on Eastern medicine which are derived from natural products. In United States 25% of all the pharmaceuticals are derived from the native plants.

MODERN DRUGS FROM TRADITIONAL MEDICINAL PLANTS

Drug	**Medical use**	**Source**
Aspirin	Reduces pain and inflammation	*Filipendula ulmaria*
Codeine	Eases pain, suppresses coughing	*Papaver sominiferum*
Ipecac	Induces vomiting	*Psychotria ipecacuanba*
Pilocarpine	Reduces pressure in eye	*Pilocarpus jaborandi*
Pseudoephedrine	Reduces nasal congestion	*Ephedra sinica*
Quinine	Combats malaria	*Cinchona pubescens*
Reserpine	Lowers blood pressure	*Rauwolfia serpentina*
Scopolamine	Eases motion sickness	*Datura stramonium*

Theophylline	Opens bronchial passage	*Camellia sinensis*
Tubocurarine	Relaxes muscles during surgery	*Chondrodendron tomentosum*
Vinblastine	Combats Hodgkin's disease	*Cantharanthus roseus*
Penicillin	Antibiotic	Fungus
Cytarabine	Leukemia cure	Sponge
Tetracycline	Antibiotic	Bacterium
Morphine	Analgrsic	*Papaver sominiferum*

So these are some of the potent drugs derived from plants mainly, used by traditional healers. Plants like *Pterocarpus marsupium* are going to be extinct due to over exploitation, because from it anti diabetes drug is extracted.

- **RECREATIONAL,ASTHETIC AND SCIENTIFIC VALUE:**

The species in natural ecosystem provides the foundation for many recreational and aesthetic interests. Millions of people enjoy hunting, fishing, camping, hiking and wild life watching. These activities provide physical, psychological and emotional restoration to human beings. Recreational and aesthetic values constitute an important support for maintaining wild species because some percentage of these recreational dollars is spent on the conservation of vulnerable and endangered species.

Ecotourism is the largest foreign exchange generating enterprise in many developing nations; according to a report Americans spend 104 billion dollars every year on Wild life related recreation.

- **BIOLOGICAL WEALTH**

The Millennium Ecosystem Assessment (MA) states that about 2 million species of plants, animals and microbes have been examined classified so far and many more species have not yet been catalogued.

The naturally occurring living species are collectively called biota, and these are responsible for the structure and existence of all ecosystems. The biota and ecosystems collectively represents the biological wealth, so all the living beings present on earth are the part of our biological wealth.

THREATS TO BIODIVERSITY

Elimination of a species is a normal process of the natural world. Species die and they are replaced by their own decendants, in undisturbed ecosystem one species is lost every decade but due to increased human population in past century the rate of extinction have increased many folds. We are losing 10000 species or sub species every year .If this trend continue we may destroy million of kind of plants, animals and microbes in the next few decades.

An Environmental philosopher Holmes Rolston III says, '**Destroying species is like tearing a page out of an unread book'.**

HABITAT DESTRUCTION

The greatest reason for the decline of biodiversity is the physical alteration of habitat through the process of conversion, fragmentation and simplification. Almost 36% of the known extinction is due to habitat destruction because natural species are adapted to specific habitat.

The most important extinction threat for many terrestrial species is habitat loss. Clear cutting of forests and conversion of grasslands to crop fields is the most important example of habitat destruction. Forest cover is becoming thinner and with this the species like the northern spotted owl, which depends on the structure and resources of old growth forest, vanish as their habitat disappears.

Natural areas are converted to farms, housing societies, shopping malls, industrial area, when a forest is cleared; it is not only trees that are destroyed but also the plants and animals that share the destroyed ecosystem. Some times we destroy habitat for the resource extraction, such as mining, dam-building and indiscriminate fishing methods. Vital stream habitats are flooded by building of big dams and it eliminates food sources and breeding spaces for aquatic species. Bottom trawling is one of the brutal methods for fishing, as it crushes the bottom fauna and flora to lifeless rubble

FRAGMENTATION

Fragmentation is the serious cause besides habitat destruction for the extinction of species. Breaking up of habitat reduces biodiversity because many species like bears, wild cats, elephants require larger territories for their survival.

Fragmentation divides their population into small isolated groups, making them much more vulnerable because a very small population may not have enough breeding adults to be viable under normal conditions. Species vanish as their habitat disappears.

Removing species of plants and animals faster than they can grow or reproduce is one of the major causes for the extinction of species.

GROWING HUMAN POPULATION

Growing human population is one of the major threats to biodiversity because with more people we need to harvest more timber, plough more land for agriculture, dig up more fossil fuels and minerals, build more houses and use more water. All these demands have a serious impact on wild species and indirectly biodiversity is also affected.

INVASIVE OR EXOTIC SPECIES

A major threat to native species in many places is from accidentally or deliberately introduced species. An invasive species can eliminate a native species by predation or competition for food and space. Exotic species are major agents in driving native species to extinction and are responsible for about 39% of all extinction.

A few important examples of invasive species are:

- Eurasian milfoil (*Myriophyllum spicatum*) is an exotic species native to Europe, Asia and Africa. It grows rapidly and tends to form a dense layer on water surface, which displaces native vegetation and inhibits water flow.
- . Water hyacinth (*Eichhornia crossipes*) is an aquatic plant species with thick glossy leaves and bulbous stalk. It bears a tall spike of flowers of pink colour. It is a native plant of South America; its growth rate is so high that it can double in only 12 days, thus covering many lakes and ponds. It disturbs the ecosystem by blocking direct sunlight and oxygen to reach to the water body.
- Asian tiger mosquito (*Aedes albopictus*) are one of the exotic species usually aggressive and deadly to birds and occasionally to people and livestock.
- Introduced or exotic species drive out many native species by competing with them for water, food and shelter. *Parthenium* and *Eupatorium* are the most **common** exotic species in India eliminating native species by competing for food and space.

STRATEGIES FOR PROTECTION OF BIODIVERSITY

Serious efforts are being made to preserve biodiversity around the world, especially in the tropics where much of the world's biodiversity exists

EXPANSION OF THE PROTECTED AREA

Maintenance of viable population of fauna and flora is a crucial factor in biodiversity conservation and it requires the conservation of important eco- systems and habitats. At present there are 88 national parks and 490 sanctuaries in our country, the area covered under protected area network is only 3.3% which needs to be enhanced.

According to a recent report by Rodgers and Panwar the number of parks and sanctuaries should be increased by 160 National Parks and 698 sanctuaries covering 5.69% of the countries geographical total. This coverage will provide a better distribution of protected area with less gaps in the protection of biographic zones,biomes and species.

CORRIDOR CONCEPT

Biodiversity corridors are areas of habitat that provide functional linkage between protected areas ;(a)to conserve habitat for species movement and for the maintenance of viable population (.b). for the conservation and restoration of ecosystem .(c) . to enhance the welfare of local communities through sustainable use of natural resources.

To improve connectivity and to overcome the negative impact of fragmentation corridor concept is the only remady . Habitat corridors have shown to be valuable for the conservation of various groups of wild life. Corridors have become a significant factor in conservation management,to reduce the isolation of spatially separated population and to increase the area of habitat .

MAPPING OF FOREST TYPES,PROTECTED AREAS AND NATURAL FORESTS

Before planning for corridors it is important to generate maps of protected areas of the country showing their contiguity with the existing reserve and protected forests. This will provide a way for determining possible corridors, habitat contiguity and buffer zones to facilitate conservation of biodiversity

CAPTIVE BREEDING AND SPECIES INTRODUCTION

Captive breeding is necessary for maintaining viable and healthy genetic stock. Captive breeding can provide animals for possible reintroduction to the wild at later stage for supplementing current population with new stock . States like Uttarakhand and Uttar Pradesh have forest preservation plots .These are important means for conservation of important flora and fauna and for assessing ecological changes over a time period in such areas .

VARIOUS ORGANISATIONS AND LAWS FOR THE PROTECTION OF BIODIVERSITY AT NATIONAL AND INTERNATIONAL LEVEL

- **Establishment of the U.S Endangered Species Act (ESA), 1973 represented** a powerful new approach to wildlife protection. According to this act, **Endangered Species** are those considered in imminent danger of extinction, while **Threatened Species** are those that are likely to become endangered. Bald eagles, gray wolves, brown (or grizzly) bears and sea otters with a number of native orchids and other rare plants are considered to be locally threatened. **Vulnerable Species** are naturally rare or have been locally depleted by human activities to a level that puts them to risk.

- **IUCN (International Union for the Conservation of Nature)** is the organisation which maintains a "Red List of Threatened Species". The list is frequently updated and there are currently 16,119 species of plants and animals on it.

- **CITES (Convention on International Trade in Endangered Species** of Wild Fauna and Flora**)** is an international agreement established to focus on trade in wildlife and wildlife parts. It was established in the early 1970's, signed by 169 nation-states. The best known act of CITES was to ban the international trade in ivory to check the rapid decline of African elephants.

- **The Convention on Biological Diversity (CBD)** was drafted and became one of the pillars of the 1992 Earth Summit in Rio de Janeiro. The Biodiversity Treaty was ratified in December 1993 and is now in force. The Biodiversity Treaty addresses three complementary objectives: 1). the conservation of biodiversity 2).sustainable use of biodiversity services, 3). the equitable sharing of the use of genetic resources found in a country.

REFERENCES

1. Aditya K .Joshi,,P.K Joshi , 2011,*Current* Science,100.
2. A. G. Jones ,. et al..A review of conservation threats on Gough island : A case study for terrestrial conservation in the Southern Oceans , (2003 *)BiologicalConservation* 113(1); 75-87.
3. M. F.Taylor,. et al. The effectiveness of the Endangered Species Act: A quantitative analysis. (2005)*BioScience* 55 (4):360- 367.

4. P.D. Sharma ;Ecology and Environment . 2009. Rastogi Publications, Meerut.
5. S. Paracer,. and V. Ahmadjian.. *Symbiosis: An Introduction to Biological Associations.* (2000)Second S edition ,Oxford University Press .
6. Reich, Peter B., et al. 2001. Plant diversity enhances ecosystem responses to elevated CO_2 and nitrogen deposition. *Nature* 410:809-10.
7. Richard T. Wright, Environmental science towards a sustainable future, 2008,Tenth edition ,259-269 , PHI Learning private limited New Delhi.
8. WilliamP.Cunningham ,Mary Ann Cunningham. Principles of Environmental Science Inquiry and Applications ;107-123 , 2007 McGraw- Hill, Indian Edition.