

LOSS OF BIO DIVERSITY WITH REFERENCE TO IMPORTANT MEDICINAL PLANTS IN VINDHYA REGION AND THEIR THREAT ASSESSMENT

P.C. Dubey *, S.N. Mishra, Arjun Tiwari
Govt. Model Science college A.P.S. University Rewa

Abstract : Vindhyan region is very rich in plant biodiversity because of its variety of geology, land shapes like plateau, plane, valley and hill areas. There are variety of climate and altitudinal variations compiled with varied ecological habitants. There are rivers like Son, Narmada, Tons and hill ranges like Vindhyan, Maikal and Satpura lies in this area. Because of various known and unknown reasons biodiversity of the area has been declining rapidly, therefor an understanding of ecological changes and its effects on biodiversity is essential for proper policy making and resource management and biodiversity conservation. By improving the socio-economic status of the local people through various alternatives, by awaking the threat of natural resources and by closely regulating and monitoring of trade and over exploitation the forest can be protected and conserved from further degradation and exploitation.

Key words : *Biodiversity, threat assessment.*

INTRODUCTION

Biological diversity or Biodiversity is the variety and variability of flora & fauna in an ecosystem. We can say richness of species, genera & families at a place.

CBD convention of Biological diversity states that biological diversity means variability among living organism from all sources. This includes diversity within species, between species and of ecosystems.

D.L. Perinan & F. Adelson define variety & variability among living organisms and the ecological complexes in which they occur.

International council for Bird preservation 1992 defines "Biodiversity is the total variety of life on earth. It includes all genes, species and ecosystem and the ecological process of which that are part——".

Biodiversity is the totality of genes, species and ecosystems in a region. The

wealth of life on Earth today is the product of hundreds of millions of years of evolutionary history.

Human cultural diversity could also be considered part of biodiversity. Cultural diversity helps people to adapt to changing conditions. Cultural diversity is manifested by diversity in language, religious beliefs, land-management practices, art, music, social structure, crop selection, diet and any number of other attributes of human society.

Losses of Biodiversity and Their causes

Around 10 million species live on earth, according to the best estimates and tropical forests house between 50 and 90 percent of this total. Scientists estimate that at these rates roughly 5 to 10 percent of tropical forest species may face extinction within the next 30 years. Rates of tropical forest loss are accelerating, and some particularly species-

* Conservator of Forest (Research & Extension forest circle Rewa (M.P.)

rich forests are likely to be largely destroyed in our lifetime. Some scientists believe that about 60,000 of the world's 240,000 plant species, and perhaps even higher proportions of vertebrate and insect species, could lose their lease on life over the next three decades unless deforestation is slowed immediately.

Tropical forests are by no means the only sites with endangered biodiversity. The biodiversity of marine and freshwater systems faces serious loss and degradation. Perhaps hardest hit of all are freshwater ecosystems. Marine ecosystems too are suffering from the loss of unique populations of many species and are undergoing major ecological changes.

The vast majority of species has not yet even been described, and many may disappear before they are even known to science.

Some species whose populations are reduced by habitat loss below the level necessary for long-term survival may hang on for several decades without hope of recovery as their population dwindles-these are the "living dead."

Habitat loss not only precipitates species extinctions, it also represents a loss of biodiversity in its own right.

World wide, some 492 genetically distinct populations of tree species are endangered. Loss of genetic diversity could imperil agriculture.

Biodiversity threat status and assessment

The world's Biodiversity is being destroyed rapidly. It's important to quantify this by measuring trends in the status of biodiversity in order to gain a better understanding of the impact that human are having and to determine how successful we are at addressing biodiversity loss.

The 2004 update of the IUCN Red list

includes assessments for 38,047 species.

- 15,589 are Threatened
- 844 - Extinct or Extinct in wild
- 3,700 - NT (Near threatened)
- 3,580 - DD (Data deficient)
- 14,334 - LC (Least concern)

The 15,589 species threatened account's for just over 1% of the world's described species includes 12% of Birds species, 23% mammal species, 32% Amphibian species, 34% gymnosperm.

Till now only 2.5% of the world's described species have been evaluated by IUCN. The number of seed plant species is highly debated. There are estimates with number ranging 223,300 to 422,127 species.

Although almost 12,000 species of plants are now recorded on the IUCN Red list, this represents only 4% of the world's plant diversity. Major species evaluated are in the gymnosperms of 4% evaluated 3% of there are threatened.

Most threatened species are in family Araceae, Compositae, Dipterocarpaceae, Euphorbiaceae, Graminae, Leguminosae, Orchidaceae, Palmae, Rubiaceae. The loss of these plants will have major socio-economic implications in the future.

- During the process of extinction unique evolutionary history is lost at every stage, but the death of the last individual of a species represents the permanent and irreversible loss of one of life's unique evolutionary and functional forms.
- 784 documented extinctions have occurred since 1500 AD. Many historic extinctions have either not been detected or not yet been evaluated for the IUCN Red list.

- 1.9% of the world's estimated 5-10% species have been described. Recent extinctions may be even more prevalent among undescribed species due to the sheer number and the fact that the discovery and description of species tends to be based towards more broadly distributed and abundant taxa.
- Among 1.9 m described species through conservation assessment are in need.
- IUCN Red list focus on global extinctions. It's important to consider all the population or local extinctions as they carry unique genetic material and are often distinct in terms of morphology or behavior.
- Loss of functional biodiversity as the species no longer plays a functional role in the local ecosystem. Such species are described as functionally or ecologically extinct.
- Documentation of population extinctions will play an increasingly important role in monitoring both biodiversity trends and ecosystem function.
- Absence of evidence is not necessarily evidence of absence.
- Thoroughly survey will take years to prove that a species is truly extinct. So flagging these possibly extinct will help to provide extinct will help to provide a much better, clearer picture of the true extent of recent extinctions.
- Total extinction in 2000 - 766 species in 2004 - 784 species.

Present status of global plant Biodiversity

- IUCN - 4 may 2006 latest release evaluates 40168 species out of this

16118 are threatened. There are 7725 animals, 8390 plants, 3 are lichen and mushroom. 1541 plant critically endangered, 2258 are Endangered and 4591 are Vulnerable.

Dicots	Ex-	77	Monocots	Ex-	2
	Ew-	21		Ew-	2
	CR-	1277		CR-	144
	En-	1836		En-	266
	V-	3973		V-	366
Total:		9538			1150

Ex -Extinct, Ew -Extinct in wild ,Cr -Critically Endangered, En -Endangered, V -Vulnerable

- Medicinal plants as a group comprise approximately 8000 species and account for around 50% of all the higher flowering plant species of India.
- Total loss as documented after 1500 AD till now and before that accounts to 784,60 Extinct, respectively.
- Last 20 year recorded 27 extinction.

Status of Biodiversity in India - an overview - A Rich heritage

India, the second largest country in Asia and Seventh in the world has a total geographical area of about 329 m ha with coast line of over 7500 km. India has enormous Ecological diversity. India has a representation of 12 biogeographical provinces, five biomes and three bioregion domains resulting into an array of habitats, like forest, grasslands, wetlands, coastal, marine and desert ecosystems. India make one of the 17 megadiversity centers. Also acknowledged as one of the world's 12 vavilovian centre of origin and diversification of cultivated plants known as the "Hindustan center of origin of crop plants. (Vavilov 1951).

India is unique in all aspects of

biodiversity. It's estimated that over 75,00 species of fauna & 45000 species of flora are found in India out of 45000 plant species roughly 19395 species are of flowering plants, 5500 species of algae, 2021 species of Lichens, 14500 species of fungi, 2700 bryophytes and 1100 species of pteridophytes are found. Of the faunal species 50,000 species are insects 4000 molluses, 2000 fish, 140 amphibians, 420 reptiles, 1200 birds, 340 of mammals are found.

This immense diversity is because of variety of the climate and altitudinal variations compiled with varied ecological habitats. According to champion & sesh there are 16 major forest type & 221 minor types and of these tropical moist deciduous forest forms the major 37% and tropical dry deciduous forms 28.6%.

The flora of India shows a close affinity with the flora of Indo - Malayan and the Indo - Chinese region. The important diversities are as follows -

1. Ecosystem diversity -

1.1 Forest cover of the country in 19.27% (633.397 km²) of geographical area. There are 16 major forest types and 221 sub types. Out of these tropical dry deciduous forest occupy most of the area followed by tropical moist deciduous forest.

1.2 Grass lands :- It covers an area of about 12 m ha i.e. 3.9% of total area. There are 5 distinct types of grasslands

- (a) Sehima - Dicanthium type
- (b) Dicanthium - Cenchrus type
- (c) Phragmites - Saccharum type
- (d) Themeda Arundinella type
- (e) Temperate alpine type

1.3 Wet land :- These are terrestrial

areas between aquatic and terrestrial ecosystems. India has about 4.1 m ha. area of this type. These systems are highly productive and acts as a biological purifiers and natural filter's.

1.4 Coastal and marine ecosystems :-

[I] Mangrove - These are self tolerant ecosystems. This systems provide fodder, fuel, fish, hides, honey, wax etc., side by side it establishes shore lines and have rare and endangered species. Area under this category is about 6700 km² roughly about 7% of the country's area

[II] Coral reef :- These are shallow water tropical marine Ecosystems. Reef's are made of calcareous skeletons of stony coral polyps.

1.5 Desert Ecosystem :- These Ecosystems cover about 2% of the total landmass in India. The sandy Thar desert is well known example. Desert Ecosystems are a store house of genetic resources of a number of life support species e.g. Amaranthus, Portulaca, Acalypha, Celosia, Ocimum, Euphorbia and Boehavia species.

2. Species Diversity :-

Though the area of the country represents about 2.4% of the world's total landmass it contain over 45,000 plant species (Mudgal 85 Hajra 1997-98). Out of 0.4m species known in the world. Thus represents about 11% of world flora. About 33% of Indian flowering plants out of 16% of total Indian flora is endemic to the country.

2.1 Angiosperms :- It's about 19395 taxa (including intra specific categories). Their are 2,984 genera and 247 families (karthikeyan 2000) and have roughly 7% of described species in the world. Family poaceae is the largest in the India, represented by 263 genera and 1291 species followed by leguminosae,

orchidaceae, asteraceae, rubiaceae, cyperaceae, euphorbiaceae, acanthaceae, rosaceae, circaesteraceae, plagiopteraceae, tetraextraceae, trichopondaceae in India are represented by one species only. Half of the world's aquatic flowering plants occur in India which has about 107 species belonging to alismataceae & 7 other family.

* About 33 species (5725) are endemic (Nayar 1996). Acanthaceae and poaceae have highest number of endemic genera. Pterocanthus and Nilgerianthus have highest number of endemic species (20 each). There are three magacentre of endemism. E&W Himalaya 85 w. ghats. There are 26 microcenters of endemism. In M.P. micro endemic centre lies at panchamari-satpura ranges.

There are 130 species of primitive angiosperm called "cradle of flowering plants" (Takhtajan 1969). eg. Magnolia, Michelia, Annona. Lithes etc.

Thus immense diversity of flowering plants provides ecological security and economic benefits also. There are 2560 tree species is flowering plants which provides lot of things, which are needed for the well being and economic activity of the country.

3. Gymnosperm :-

In India there are 58 taxa under 15 genera and 8 families (sahini 1998). Family pinaceae is the largest one. E. Himalayan region have more species diversity. Genus *Juniperus* and *Ephedra* have maximum diversity in W. Himalaya 85 Pinus in E. Himalaya.

Species of cycas are distributed widely in E. 85 W. ghats. In N-E region majority of species of *Ephedra* are switchy green shrubs. *E. foliata* is a climber occurring in drier plants of Punjab & Rajasthan. *Gnetum* is found in

evergreen tropical rain forest of E. & W. ghats.

4. Pteridophytes :-

It gives a variety of habitet. They prefer shady and moist places but *Adiantum lunulatum*, *Psilotum nudum* grows on rocks covered with mosses and in rock crevices. *Woodsia elongata*, *Actinopteris radiata* occurs in dry places. 17% of the total this group of species are endemic to India.

5. Bryophytes :-

There are 2800 species found in India belong to this group. They are first colonizer of the terrestrial habitat. They inhabit narrow ecological niches with preferences for dam and shady conditions. Genus *Buxfaunia* (Moss) represented by single species *himalayensis* which is not autotroph.

6. Lichens :-

At present there are 2021 species and 248 genes are known to occur in India.

7. Fungi :-

There number is around 14500 species in 2300 genera. (Bilgrammi est. at 1991) 3500 species are endemic.

8. Algae :-

Roughly 6500 species in 666 genera are there. 1924 species are endemic. Freshwater algae chlorophyceae & cyanophyceae represent the major species. Next comes terrestrial species. *Spirogyra*, *Ditella*, *volvox* are main dominant species.

Status of India Biodiversity as per IUCN present status of India's plant Biodiversity is as given	Ex-	1
	CR-	42
	En -	92
	Vul -	188
	NT-	166
	LC -	1413
	DD -	142
Total:		2044

THREAT ASSESSMENT (BD ASSESSMENT) OF SOME IMPORTANT MEDICINAL PLANTS IN VINDHYAN REGION.

For closer look of Biodiversity of Vindhyan region Research and Extension center forest deptt. has taken to know the present status and to make aware, the local people and forest deptt. staff about the natural resources, there ethanobotanical knowledge and cause for threat and measures to conserve this initiatives in this direction so as to monitor the biodiversity. For this guidelines laid down by IUCN version 3.1 has been followed. Guidelines have not been followed in a very strict sence because it will require lot of money, labour and lot of time. Time is very important factor as it will takes year's to evaluate the status of plants and there may be so many reason to discontinue the process in between so as to give glimpses or reflection of the present status, we have decided to complete it in a short time i.e. within one year. We have adopted procedure which can curtail time gap. i.e. by direct intensive contact and line transect.

Survey of the biodiversity richest area of the concerned districts. Major thrust have been given on the contacts with local people who are directly concerned and have been in close proximity since last 20 to 30 year with the natural forest and second thrust point given on the survey to rich biodiversity areas and then pooled the data so obtained. There may be little mistakes in putting few of the species under different categories but it will not be changed except one step up and down in few species only. This list will provide rough base line for future study and correction can be made as soon as the mistake comes in the picture after wide circulation and deliberation of the list. Lot of other information has also been taken during this process which will help to understand the species concerned and to develop strategy to conserve them, to protect them. During the process number of local people have been consulted by the team, forest division working Plan have also been gone through. List have been circulated to important organisations and important institutions for there suggestions.