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# Study of Vegetation and Flora of Chambal Region (M.P.)

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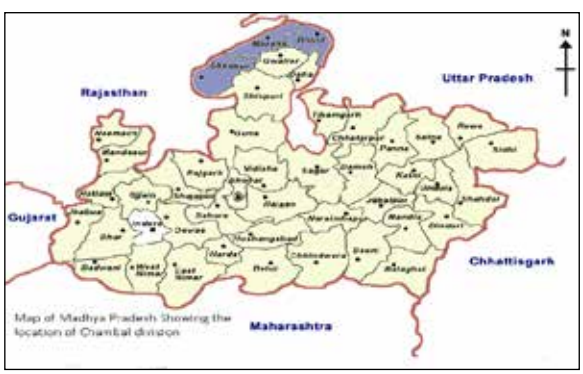
## ABSTRACT

*The Chambal division of Madhya Pradesh is geographically know for its ravines. The area lies with the semi-arid zone of north –western India at the border of M.P., Rajasthan and U.P. states and the vegetation consists of ravines thorn forest. Thorny bushes or small trees commonly fond in this area include Acacia nilotica, Acacia Senegal, Balanites aegyptica, Capparis sepiaria and Capparis decidua. The environmental complex from the view point of climate, soils and biotic factors has been found to be relatively unfavourable to the proper and luxuriant growth of the vegetation. The eco-climatic conditions and environmental set up is changing day by day due to various socio-economic activities. There are many species of this regions have been disappeared by biological activities.*

**INTRODUCTION:-**

Chambal region is the most important division of Madhya Pradesh which Comprises three districts are Morena, Bhind and Sheopur. The divisional head Quarter are located at Morena town. The division of Madhya Pradesh is geographically know for its "Ravines" (Beehad).



Map of Madhya Pradesh Showing the location of Chambal division

**STUDY AREA:-**

In the present ecological survey the area selected is the part of Chambal region (basin) is located between $22^0$ $27^1$ N and $27^0$ $20^1$ N latitudes and $73^0$ $20^1$ E and $79^0$ $15^1$ E longitudes at a height of 175 meters above mean sea level. On its south, east and west, the basin is bounded by the Vindhyan mountain ranges and on the north-west by the Aravallis. The Vindhyan scarps in the North West flank the left bank of the Chambal and subsequently is mainly drained by it. The River Chambal and its tributaries kali sindh and Pārbati have formed a triangular alluvial basin about 200-270 m above the narrow trough of the lower Chambal in Kota. The important rivers of this region are Chambal, Kuwari, Aasan, Seep, Baisali, Kunho, Parvati, Sanka, Sindh and Pahuj.

**METHODS:-**

During the preliminary survey from September 2009 to December 2012. The plants occurring in different areas of Chambal region have been collected and identified by Deptt. of forest and Deptt. Botany Govt. College, Morena, Bhind and Sheopur Dist. Nomenclature of species mostly follows flora of Pachmarhi (Mukherjee 1984). Flora of Jabalpur (Oomachan 1996), Flora of Madhya Pradesh (Mudgal 1997 and Verma 1993) and Ph.D Thesis (Pathak 2001).

**CLIMATE:-**

The climate of the Chambal basin which lies in the sub-tropical climate belt is generally moderate and the heat is never excessive. The annual rainfall has been quite irregular from 535 mm to 833 mm. occurs during the months of June to September. The mean maximum temperature are is about 450C while mean minimum is about 2.00C. During rainy season favourable for plant growth. It is interesting to note that the fluctuations of mean maximum temperature for different months and years are not considerable, while there are fluctuations between maximum and minimum temperatures during the period of January to June and October to December. From July to September, temperature do not differ to an appreciable degree.

**GEOLOGY AND SOILS:-**

According to Crowford (1969) the Chambal river valley is part of the Vindhyan system which consists of massive sand stone, slate and limestone, of perhaps pre- Cambrian age, resting on the surface of older rocks. Hillocks and plateaus represent the major land forms of the Chambal valley. The Chambal basin is characterized by an undulating flood plain, gullies and ravines. Chambal valley and indo-Gangetic alluvial tract are of Pleistocene to sub-recent age. Bad land topography is a Characteristic feature of the Chambal valley, where as kankar has extensively developed in the older in the alluvium. The soil of Bhind is very fertile and is well drained by the Chambal, kalisind, Kwari, Pahuj and Baisali rivers. Wheat and oilseeds are the main crops, building stone is quarried.

**BIOTIC FACTORS:-**

The biotic factors in the area is vary adverse due to excessive grazing of animals, deforestation, white-ants, plant and animal pests constitute the most important biotic factors and soil erosion problem affecting the growth of vegetation in different seasons. Deforestation increasing population pressure faulty irrigation projects and short term developmental Schemes seemed to have fuelled the formation of ravines resulting in loss of productive land.

**VEGETATIONAL ASPECT:-**

The area lies with in the semi- arid zone of north –western India at the border of Madhya Pradesh, Rajasthan and Uttar Pradesh states and the vegetation consists of ravine thorn forest (Champion and Seth1968). This sub type typically occurs Alkaline Babul savannah (5E/8b), a type of Northern Tropical Dry Deciduous Forest, also occurs. Evergreen riparian vegetation is completely absent, with only sparse ground cover along the severely eroded river banks and adjacent ravine lands. The forest can be categorized as follows.

- The semiarid tract.
- Thorny bushes or small trees
- Miscellaneous forest
- Mixed forest
- Grasslands

In addition to these almost pure plantations of Acacia nilotica, Prosopis juliflora may be seen. The semiarid tract in Madhya Pradesh is represented by Chambal catchment extending up to Narmada and Betla Rivers. Over 1000 flowering plants have been reported (Verma,1993) including Anogeissus latifolia, A.pendula, Tectona grandis , Lannea coromandelica, Diospyros melanoxylon, Sterculia urens, Mitragyna parviflora, Butea monosperma, Emblica officinalis, Boswellia serrata , Bridelia squamosa and Hardwickia binata. Species composition at shrub

and ground layer is similar to that of semiarid regions of Gujarat . A few climbers of this area include species of Rhynochosia, Atylosia , Cocculus , Cissampelos . Ipomoea Pergularia daemia, Pueraria tuberosa and Tinospora cordifolia.

Thorny bushes or small trees commonly found in this area include Capparis decidua ,Capparis sepiaria, Balanites aegyptiaca , Acacia Senegal, A.nilotica, A.leucophloea, Prosopis juliflora, Butea monosperma, Maytenus emarginata, Tamarix sp., Salvadora persica, S.oleoides, Crotalaria medicaginea, C.burhia, Clerodendron phlomidis Calotropis procera, Xanthium indicum, Zyphus xylopyra, Holoptelea integrifolia, Acacia arabica, Aegle marmelos, Zizyphus mauratiana, Acacia leucophloea and Leptdenia pyrotechnica associated with climbers such as Maerua oblongifolia, Pergularia daemia, Ceropegia bulbosa, herbs e.g. Argemone Mexicana Tephrosia purpurea, Cleome viscosa, Tribulus terrestris, Glinus lotoides, Sericostoma pauciflorum, Rivea sp., Ipomoea sp., Pedalium murex, Sesamum mulayanum, Lepidaagathis sp., Boerhavia difffusa, etc.

Mixed and miscellaneous forests, in addition to these also have Buchnania lanjens, cassia fistula, Hardwickia binata, Terminalia arjuna, Mangifera indica, Emblica offcinalis, Tamarindus indica, Anogeissus pendula, Bauhinia variegata, Feronia elephantum, Albizzia lebbek, Mimusops hexandra , Ficus glomerata, Delonix regia, Wrightia tinctoria, Dalbergia sissoo, Azedirachta indica, Ficus infectoria, Butea monosperma, Melia azedarach, Ficus benghalensis, Ficus religiosa also seen.

Under shrubs in these forests consists of Adhatoda vasica, Achyranthes aspera, Xanthium straumarium, Capparis horrida, Capparis aphylla, Zizyphus rotundifolia, Opuntia dillenii, Indigofera pulchella, Vitex negundo, Helictres isora, Argemone mexicana, Nyctanthes arbortristis, Balanites roxburghii etc. are frequent.

Amongst stragglers and climbers most common is Mucuna pruriens, Tinospora cordifolia, Abrus recatorius, Asparagus racemosa, Ventilago calyculata etc. are seen.

Among grasses are Saccharum spointaneum, Desmostachya bipinnata, Vetiveria zizaniodes, Dendracalamus strictus, Dichanthium annulatum, Saccharrum munja, Cyprus sp., Fimbristylis sp., Braehiaria sp. , Cenchurus, sp. etc.

Parasite and Epiphytes Cuscuta reflexa, Viscum nepalense. Dendrophthoe falcata and Vanda tessellata are also seen.

Hydrophytes are frequently come across are Nelumbo nucifera, Trapa natas, Cerotophyllum demersum, Hydrilla verticillate, Potomogaton pectinatus and Eichornia crassipes etc.

**RESULTS AND DISCUSSION:–**

A knowledge of plant communities and their relationship with environment, includes a basic study of ecosystem. the relationship between environment and vegetation in known to be complex. Definite information on the phytogeographical affinity of the flora of Chambal is also lacking. The present study was undertaken in view of the importance of these two fundamental aspects of scientific information to national progress.

The environmental complex from the view point of climate, soils, and biotic factors has been found to be relatively unfavourable to the proper and luxuriant growth of the vegetation water deficit due to low and irregular rainfall, high evaporation rates generally exceeding precipitation and adverse tempreture result in semi-arid climate.

In this study more emphasis is laid on altitudinal zones of the hills, the effect of exposure to solar radiations and other environmental variables. Plant communities affected by topography soil nature and available soil moisture in addition to the adverse factors of climate.

The soils in valleys are comparatively rich in organic content. water soluble salts. The soils are nearly neutral or alkaline and support better vegetation with tress. The soils of the tectonic plains have comparatively with low humus content and more adverse biotic factors results in to poor growth of vegetation.

Soil and gully erosion have caused major environmental diaster worldwide. Many urban and rural communities have been severely affected while the sustainbility of the total landscape has been threatened. National commission on agriculture estimated that India has 3.67 million hectares of ravine land constituting 1.12% of total geographical area. Rapid spread of ravines is a recent phenomenon more so in Chambal region. The Chambal division, which has an area of 16.14 lakh hectares around 20% of the division (around 3.107 lakh hect.) are ravines. The plant the thorny Acacia nilotica heightened the living in the area as the new thorn forest made.

The eco-climatic conditions and environmental set up is changing day by day due to various socio-economic activities. Thousands of hectares of fertile land along the banks of like Yamuna, Chambal, Mahi and their tributaries have been ruined by ravine formation in U.P., M.P., Rajasthan and Gujarat. The present condition of the forest is very poor and many species of this regions have been disappeared by biological activities. There are many species in many part is now endangered and very rare. The most striking and surprising part is none of the any organization are keen to protect this ecological systems, although good amount of many is following for the resteoration of natural recourses.

**CONCLUSION AND SUGGESTIONS:-**

Our study indicate that in present setup of the environmental conditions and socioeconomic structure, the rate of deforestation and soil erosion will be continued and a time will come there would not be any thorny forest in our country.

- Development of vegetation cover in deep ravine areas.
- Afforestation in the forest along the Chambal, Kwari, Sindh, Vaishali and Pahuj river.
- Control the soil erosion.
- Restoration of water quality.
- Demand of the region appriate fodder cultivation system is to developed .
- Conservation and improvement of natural and crop soil fertility.
- Stop sand excavation and stone mines activity.
- Conservation practices for biodiversity.
- Reclamation and rehabilitation of mining areas.
- Revegetation of mining wastelands.

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