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Classification of Multi-purpose Floras in Jhunjhunu Region, Rajasthan

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Abstract: ***The district is irregular hexagon in shape in the northeastern part of the State lies between 2702" east longitudes. It is surrounded by Churu district on the northwestern side Hissar and Mahendragarh district of Haryana State in the northeastern part and by Sikar district in the west, south and south eastern part-2. For the propose of administration the district is divided into five administrative subdivision viz, Chirawa, Udaipurwati, Jhunjhunu, Khetri and Nawalgarh Six Tehsil viz Jhunjhunu, Chirawa, Khetri, Nawalgarh, Buhana, Udaipurwati and eight Panchyat Samities viz Jhunjhunu, Chirawa, Khetri, Nawalgarh, Buhana, Udaipurwati, Alsisar and Surajgarh.***

1.1. STUDY AREA :

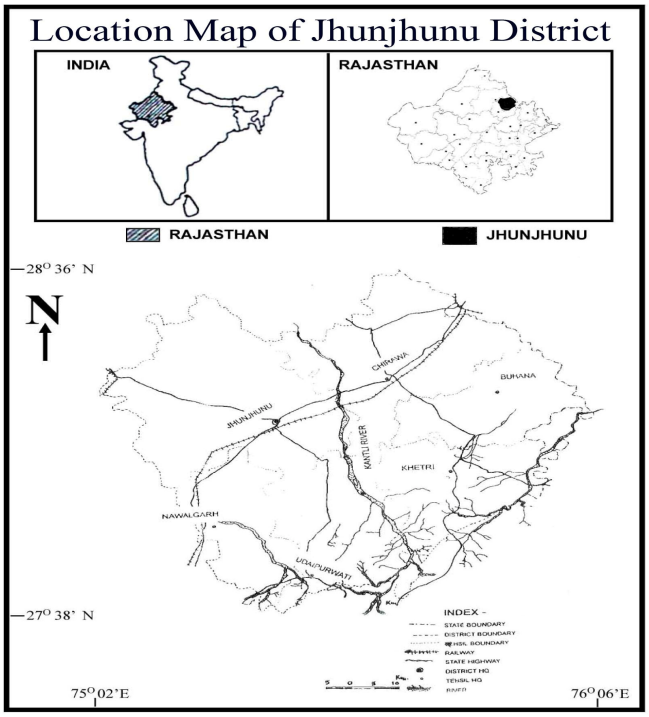
The total geographical area of the district is 2928 square Kms. This stands at 1.73 percent of the total area of the state from the points of area, Jhunjhunu district stand at 22nd place among the existing 33 districts of the state most of the part of the district is coerce by blow sand and dunes which for part of the great that desert sand shifting and active dunes are main hazards to cultivation. Soil erosion is the Result of constant deforestation and mining activity which have resulted in baring the slopes.

The hilly area in south eastern part of district is characterized by hills of Aravalli range, running in north easterly direction. The highest peak, 1051 m high is in the south of Lohagar village bordering Sikar district. Hills are almost barren of vegetation except a few bushes of acacia and cactus.

The undulating area with small isolated hills having steep slope lies in the south western part of district. The major portion of hills is found in Khetri and Udaipurwati tehsils. The general elevation above mean sea level rests between 300 and 450m Quaternary level forms are represented by sand and colluvial deposits of talus and scree at piedment slopes.

The desertic plain generally lying at an altitude of about 300m amsl occupies the northern part of the district and is covered with sand dunes. The general slope of the area is from south to north. Sand dunes are drifting in nature.

District Jhunjhunu is situated in Arid Rajasthan plain known as Rajasthan. It comprises of Rolling hills, some of the arrival ranges in the southeastern side running in the south eastern Direction and range of the Aravali Hills in extreme southeastern of Udaipurwati existing towards Singhana and Khetri in the east, viz Nawalgarh-Khetri upland its general elevation above means sea level is between 300 to 450 meters.



The highest peek is in the south of Lohagarh village and its height is 1051 meters, this is no perennial river in the district katti and Dohan are only seasonal rivers. River katti originated from Khadela hill sides of Shrimadhopur Tehsil. Sikar and enters near south west of Udaipurwati tehsil running towards north –west direction and ultimately disappears in the sandy tracks of the Churu District. This river, however, divides the district almost into two parts. Similarly Dohan River also originates from Shrimadhopur hills and flows to north –eastern direction passing through some eastern part and ultimately disappears in sandy tracks of Mahendragarh district of Haryana Besides, there. Major streams of Udaipur Lohagarh ki nadi chandrawati and sukh nadi. There is no lake in the district however small tanks are in existence in some areas. There are only four tanks used for irrigation purposes. There is also a bound of "Ajit Sagar" about 11Km. from Khetri on Nizampur road.

The district of Jhunjhunu is poor in forest resources as the total area under forest including hills is reported to be 39613 hectares which is 6.65 % of total geographical area of the districts. The forest coverage is below the state average of about 9 % under forest. If compared to the 13 % of forest area at national average. The district comes out to be roughly half of the matomn average.The major species available in forest is 'Jant" tree or Khetri (prosaic specigera) it is found in abundance and is utilized' for various purpose as providing folder to the animals supplying fuel for domestic purpose and checking sole erosion. Other species found are Babul, Shisham, Neem, Pepal, Hingotia, Karli, Akara, Mango trees, Ber tree etc. Among the wild animals, Baghera, soor, Languor, Lakkar Bhaga, Bhedia, Lomari, Gidar, etc. are generally found snakes other poisonous and non-poisonous are also found in the district.

1.2 INTRODUCTION :

From a long time it has been felt by the society of environmental conservation welfare people in the world that natural flora should be protect, preserve, and reserve at any cost to save the future of the next generation, not an individual but at global level. It has been resolved and decided after several meeting on environmental conservation at global level, portfolio and policies were formulated for implementation of the management of green coverage specially the forest resources that each and every country or a geographical region should have at least 33 percent or more than that of total area under forest cover in other wards to say "One - third land use of any country or region should be under the title of forest land use".

In this way the similar efforts have been carried out by each country, state and district to enhance the land under green coverage, in this direction. Afforestation and plantation programmes has implemented by the public as well as private sector. Peoples participation has been realised out several times for the implementation of the forest policies for the enhancement of the green coverage in that particular area. It is quite obvious in the eyes of environmentlists that sustainable development of a particular area is possible with the enhancement of green coverage, hence the Forest Department in public sector and NGOs in private sector are making their efforts from some decades in this direction. Specially afforestation programmes have been carried out time to time by the Department of Forest, Aravalli project and Social Forestry.

In scientific perception, "a Forest is that area which is closed with a boundary, dense flora and more percentage of trees."

"Natural flora is consider to be the best expression of the totality of the climate" - Koppen

All kind of efforts either from public or from Private sector - the ultimate target is to enhance the land under forest as well as flora coverage. Further in this context their two kinds of forest areas sector and private forest areas i.e. from private sector. State forest is further classified in to three - Reserve forest, Protected forest, and unclassed forest where as private forest is also further classified into two categories area of closed under Indian Forest Act. In this way total forest area of the district includes both kind of forest i.e. State Forest and Private Forest

As early as 1807, Humboldt had recognised the tendency for certain flora physiognomies (and hence flora structures) to be concentrated in specific environments. However, the explanation of such correlation remained obscure until the exposition of natural selection and evolution by Darwin in 1859. Darwin's work set in motion for a period of widespread attempts to find adaptive value in all features of organisms. In botany, this led to 'explanations' of the adaptive value of various flora life forms (Schimper 1903; Warming 1909).

While the observations of these early workers on environment and life form correlations were undoubtedly accurate, the exclusively adaptive explanations offered must be modified in light of more widespread field data and developments in the fields of evolutionary theory and genetics. Observations from widely separated parts of the globe, possessing floras of very different evolutionary history and gene pools, indicate the very different life forms that can evolve in response to similar environmental opportunities.

1.3 FOREST AND FLORA :

The district forest resources are poor and the total area under forest including hills is reported to be 396830 hectares. This is just 6.69 percent of the total geographical area of the national average. Forest area which is 13 percent the district comes out to be roughly half of the national average. The major species available in the forest area is 'Jant' tree or Khejri (Prospis specigera). It is found in abundance and is utilised for various purposes such as providing fodder to the faunas when its leaves are dried up, supplying fuel for domestic purposes and checking soil-erosion. Other species found are Babul (Acacia nilotiea), Shisham (Dalbergia sisso), Neem (Azadirachta indica), Pipal (Ficus religiosa), Jal (Salvadora oleoides) and Bargad (Ficus bengalensis) etc. Mango trees (Mangifera indica) are also found in hilly areas of Udaipurwati and Khetri tehsils. Beri tree (Zizyphus mauritiana) is also available which provides 'Pala' as a fodder to the faunas. There is a forest nursery at Jhjunjhunu.

Grasses of a few types also grow in the region. Among the shrubs, Phog (Calligonum polygonoides) is the most predominant. Among the wild faunas, Baghera (Panthera pardus), Soor (Susserofa crestatus), Langur (Presbytis entellus), Lakkar-Bagha (Hyaena hyaena), Bhedia (Canis lupus), Gidar (Canis aureus), Lomri (Vulpes bengalensis) etc., are generally found. Snakes, both poisonous and non-poisonous are found in the region.

Major forest products of the district are honey wax, grass and bones. Since the conditions are conducive for intensive growth of forest species in the district therefore it is obvious that the forest sector in the district has not attained a commercial viability so for. It is worth mentioning here that recently attention has been given to this district for propagation has been ried out in this district.

1.4 MULTIPURPOSE FLORAS :

According to The Penguin Dictionary of Botany the subject Plant Geography or Phytogeography has been defined as, "The study of the geographical distribution of floras and their inter-relationship with one another with the environment. Many aspects overlap with the science of ecology but plant geography places more emphasis on the influence of the environment." This much we know that study of floras in service of mankind has been remained a part of human civilisation. The information on the economic floras with their economic aspects have been passed from one generation to next generation without any published records. It is in this light, a new branch of botany has emerged, termed as Ethnobotany and the Scientists of the world are keen to examine the practical uses of all floras reported or unreported. In this direction an appropriate analyses of the subject has already been made and presented in the earlier chapter. The present chapter deals the details of analytic aspect of the dominant multipurpose floras species of the district, It also includes the descriptive notes for the phytogeographic distribution of each dominant Multipurpose Flora Species in the world as well as in general and India in general and the area under study particular. These notes have been adopted from the records published in the flora's written by some author for the Desert region; although the author of this book has not included Jhunjhunu district but it covers an appropriate literature from taxonomy point of view for meaningful guidance.

After collecting the information thoroughly from all over of the study sites in Jhunjhunu district in different area's of habitats for the collection of information about the uses as well as application of the flora species which are being used by the native inhabitants from centuries their earlier times. As already prescribed the details of Useful floras of the area in existing flora which revealed that more than 50 percent floras of the existing flora are useful which have their applied sense, further in this context similarly, the observations revealed that these useful flora of existing flora can obviously be divided under five main broad categories which are known as "Applied Categories". Thus, Applied Categorisation of the Useful flora species has been done according to the nature of their utilisation for the welfare of human beings as well as domestic faunas, namely- A Fuel, B- Medicinal C-Fodder, D-Edible and E-Commercial. Among useful floras of Jhunjhunu district, maximum percentage is covered by Edible purpose (28%)) flora species where as minimum by the flora species which are being used for Fuel purpose (41%). Among floral groups, Herbaceous floras group ranks at first by covering 39.6% of useful flora species where as the climbers group ranks at last i.e. 4.7% only, respectively.

It is quiet obviously to mention here that among the useful floras, all species are not considered as multipurpose floras, it is here by necessary to mentioned that the useful flora species which cover three or more than three Applied Categories (Fuel, Medicinal, Fodder, Edible and Commercial) are termed as Multipurpose floras for Multipurpose Flora Species .

TABLE : 1.1. CLASSIFICATION OF MULTI PURPOSE FLORAS

S.No.	Name of the Flora Species	Local Name	Flora Group (Family)	Xerophytic Category	Leaf Class	Applied Categorization
A	**Trees :**					
1	*Acacia nilotica*	Desi Babul, Kikar	Trees (Mimosaceae)	ST	LP	FU, FO, CO
2	*A. senegal*	Kumat, Khairi	Trees (Mimosaceae)	ST	LP	FU, ED, CO
3	*Adhatoda vasica*	Ardoo, Ardu	Trees (Acanthaceae)	RS	MAP	FO, FU, CO
4	*Anogeissus pendula*	Dhaokada, Dhok	Trees (Combretaceae)	TC	NP	FU, FO, CO
5	*Azdirachta indica*	Neem, Neemdo	Trees (Meliaceae)	TC	MIP	FU, MD, ED, CO
6	*Boswellia serrata*	Salaran, Salar	Trees (Burseraceae)	TC	MIP	FU, MD, CO
7	*Butea monosperma*	Palas, Tendu	Trees (Fapaceae)	TC	MAP	FU, CO, MD
8	*Balanites aegyptica*	Hingota, Hintotia	Trees (Simaroubaceae)	ST	MIP	FU, MD, CO
9	*Cordia gharaf*	Gundi	Trees (Ehretiaceae)	TC	MIP	FU, FO, ED, MD
10	*Ficus bengalensis*	Bargad, Bad	Trees (Moraceae)	TC	MAP	FU, MD, ED, CO

11	*F. religiosa*	Pipal	Trees (Moraceae)	RS	MAP	FU, MD, ED, CO
12	*Mangifera indica*	Aam	Trees (Anacardiaceae)	RS	MAP	FO, ED, MD, CO
13	*Prosopis cineraria*	Khejra, Jhanti	Trees (Mimosaceae))	ST	LP	FU, ED, CO
14	*Salvadora oleoides*	Pilu, Jal	Trees (Salvadoraceae)	RS	MIP	FU, FO, ED, CO
15	*Tamarindus indica*	Imli	Trees (Caesalpiniaceae)	RS	LP	FU, FO, MD, ED, CO
16	*Tamarix dioica*	Farash, Jhau	Trees (Tamaricaceae)	LL	LL	FU, FO, CO
17	*Tecomella undulata*		Trees (Bignoniaceae)	ST	NP	FU, FO, MD, ED, CO
18	*Zizyphus nummularia*	Bordi, Beri	Trees (Rhamnaceae)	LL	LL	FU,FO, CO
B.	**Shrubs :**					
19	*Calligonum polygonoides*	Phog Phogdo	Shrub (Polygonaceae)	LB	MAP	FO, MD, CO
20	*Calotropis procera*	Aak, Aakdo	Shrub (Asclepiadaceae)	ST	LL	FU, ED, MD, FO, CO
21	*Capparis decidua*	Ker, Teent	Shrub (Capparidaceae)	LB	LL	FU, MD, ED
22	*Euphorbia caducifolia*	Dandathor	Shrub (Euphorbiaceae)	TC	NP	FO, MD, CO
23	*Indigofera oblongifolia*	Golia, Jhil	Shrub (Fabaceae)	LL	LL	FU, MD, ED
24	*Leptadaenia pyrotechnica*	Khip, Khimpdo	Shrub (Asclepiadaceae)	ST	NP	FU, MD, CO
25	*Lycium barbarum*	Morate, Murali	Shrub (Solanaceae)	TC	MIP	FO, MD, CO
26	*Withania somnifera*	Aasgandh,	Shrub (Solanaceae)	ST	NP	MD, ED, CO
C.	**Undershrubs :**					
27	*Achyranthes aspera*	Andhi Jhara	Undershrub (Amaranthaceae)	ST	MIP	FU, FO, MD, CO
28	*Barleria prinoitis*	Bajardanti	Undershrub (Acanthaceae)	TC	NP	MD, ED, CO
29	*Ocimum americanum*	Bantulsi, Bapchi	Undershrub (Lamiaceae)	ST	NP	ED, CO, FO
30	*Rhus mysorensis*	Danser, Dansari	Undershrub (Anacardiaceae)	TC	MIP	MD, ED, CO
D.	**Herbs :**					
31	*Citrullus colocynthis*	Tumbo, Tush,	Herb (Cucurbitaceae)	RS	MIP	MD, ED, CO
32	*Cleome viscosa*	Bhangaro, Hultnal	Herb (Capparaceae)	TC	NP	FO, ED, MD, CO
33	*Indigofera. oblongifolia*	Neela Baker	Herb (Fabaceae)	TC	MIP	FO, MD, CO
34	*Portulaca oleracea*	Luni Khaira	Herb	RS	NP	FO, ED, MD

			(Portulacaceae)			
35	*Solanum nigrum*	Makai	Herb (Solanaceae)	ST	LP	FO, ED, MD, CO
36	*T. portulacastrum*	Safed-Santo	Herb (Aizoaceae)	RS	MIP	FO, ED, MD
E.	**Grasses :**					
37	*Desmostachya bipinata*	Dhab	Grasses (Poaceae)	TC	NP	FO, MD, CO
38	*Saccharum begangalense*	Munja Ghass,	Grasses (Poaceae)	TC	MAP	FU, FO CO
F.	**Climber :**					
39	*Momordica balsamina*	Ban- karelo	Climber (Cucurbitaceae)	TC	MIP	ED, MD,CO

Source: Field Surveys and Literatures

Table : 1.1. deals about the analytic aspect of the multipurpose flora species of Jhunjhunu district, Rajasthan. The present chapter carry the study of phytogeographic account of these multipurpose flora species which include five points phytogeographic distribution at global i.e. at Macro-level, and regional distribution i.e. at Meso-level, Floral Groups, flora's Family, Xrophytic Categorisation, Leaf-class and Applied Categorisation.

There are thirty nine floras for the area under study as mentioned in the table that out of thirty nine floras 11.4% belong to group of trees 22.8% floras fall in the group of shrubs, 11.4 belongs to under shrubs, 17% as herbs and 5.8% floras are grasses and only 2.8% floras fall under the group of climbers. Thus, the group of trees ranks at first place among multipurpose floras of Jhunjhunu district from floral group point of view. Desert floras have five main categories of Xerophytic Categorization viz; Spiny and Thorny, Trichomes covering leaves, Lactus bearing flora species and remaining under Rest of the species.

Thirty nine multipurpose flora species belong to different flora families in which 9 multipurpose flora species belong to three families i.e. Fabaceae, Mimosaceae and Solanaceae, and by thus cover 23.3% of the total multipurpose flora species. Remaining 30 multipurpose flora species belong to 24 different families according to their flora taxonomic classification point of view.

The table also shows that 25.6% of the multipurpose floras fall in the group of Spiny and Thorny 38.4% floras fall in the group of Trichomes covering category, Leafless category has 7.6% floras, Xerophytic Category, Lactus bearing floras category covers 5.1% wheras floras under Rest of the species category covers 23 percent of multipurpose floras of the area under study.

Leaf classes categorization point of view, it is revealed that among multipurpose floras 7.6% are Leafless, 12.7% belong to Leptophylls whereas Nonophyllsare 25.6%, Microphylls category covers 30.8% floras amont multipurpose floras whereas Macrophylls category has 23.3%, respectively. For example, among multipurpose flora species from applied categorisation point of view one can find that two floras (*Prosopis cineraria* and *Zizyphus nummuleria*) are used as "wholesome flora," in fact hardly any part and portion is left without of any use in applied sense where as remaining multipurpose floras have naturally cover their three or more than three applied categories of applied categorisation aspect.

The commercial applied category involves the local benefits or interests of economic value of any part and portion of the flora, commercial sale either at local level demand or any industrial level requirements, e.g. gum collection and its economic benefits etc.

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