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Geography of Shekhawati Region, Rajasthan

Dr. Mukesh Kumar Sharma 'Bhatt'

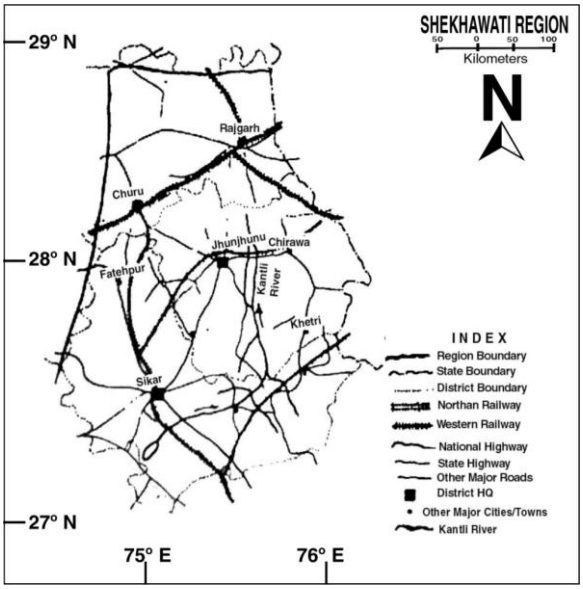
Principal, Maharani Girls PG College, Rampura, Alsisar, Jhunjhunu, Rajasthan.

Abstract: ***The area under study covers fully or partly three districts, namely Churu, Jhujhunun and Sikar. Churu district's out of 7, only 3 tehsils fall under Shekhawati region (Churu, Rajgarh and Taranagar) whereas Jhunjhunu district as a whole with its six tehsils (Buhana, Chirawa, Khetri, Jhunjhunu, Nawalgarh and Udaipurwati) in which Buhana tehsil emerged out as a new tehsil on the map of Jhunjhunu district (2001), it was no more existence in the year of 1991 and Sikar district also covered fully with it's six tehsils (Data Ramgarh, Fatehpur, Laxmangarh, Neem ka Thana, Sikar and Shri Madhopur).***

1.1. INTRODUCTION :

Figure-1.1 shows the area under study i.e. Shekhawati region which is located in the north-eastern part of Rajasthan state and the region has geographical extension from 26°26' to 29°20' N latitude and 74° 44' to 76°34' E longitude on the map of Rajasthan. The region has 23 Panchayat Samitis in all. Thus, the region under study has 15 tehsils in total with it's total 15343 sq. km. geographical area which makes 5.6% of the state's total. At the part of district-wise contribution by area point of view in Shekhawati region it is observed that part and portion of Churu district contributes 29%, Jhunjhunu district contributes 31% and Sikar by 40%, respectively.

FIGURE- 1.1 LOCATION MAP OF SHEKHAWATI REGION



Among these tehsils area point of view, the tehsil of Churu is largest one and Buhana smallest, respectively. District-wise area point of view Sikar stands at first position which is followed by Jhunjhunu and lowest contribution is made by Churu i.e. 1683 sq. km. only.

At the part of population, Shekhawati region contributes 8.7 percent of the state's total in which sex-ratio is 948 females per thousand males in Total Population whereas it is very low i.e. 887 in Child Population for the area under study. The region obtains high Literacy rate which is about 10% more than that of the state's average. Among tehsils, Buhana ranks at first position while as Neem ka Thana contributes lowest in this aspect. The region obtains high density (244) i.e. 50 percent more than that of state's average which is 165 persons per sq. area 2001. The region has also Slum population but it is very low or to say negligible i.e. 2.5% only of the urban area's total.

The whole region has distribution of two types of soils; Sandy soil and Red Loamy soil. The former soil type has obvious distribution in Churu district, the areas of sand dunes topography; the later soil group is mostly distributed over the districts of Jhunjhunu and Sikar (classification based on dominancy, availability and agricultural productivity). The

distribution of soil type and it's physical as well as chemical nature is a significant aspect from vegetation as well as plant species distribution point of view.

On the basis of another type of soil type classification according Prof. Thorpe and Smith based on the origin of the soil, the observations revealed in this direction that Remosols type of soil has distribution in the areas of sand dunes topography; all three tehsils of Churu districts have, Red sandy soil which is more alkaline in nature. Hilly topography soil and Riverine soil have their distribution according the distribution of habitat of study area.

Here, the author is illustrating the geographical perspective of the area under study in brief with it's significant components from the specific interest of the subject of study point of view. Any way, overall the present chapter's matter is divided into three parts from descriptive account point of view- viz; physiographical characteristics, land use pattern, and demographic aspect.

1.2. PHYSIOGRAPHICAL CHARACTERISTICS

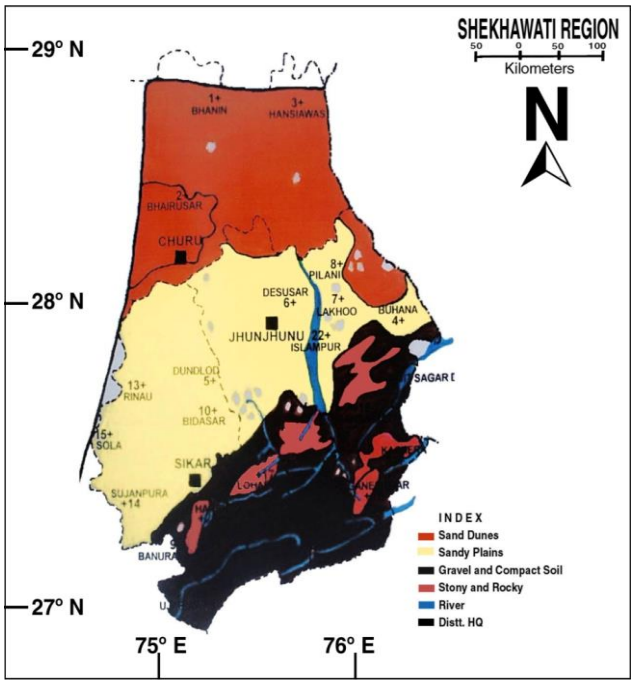
The state of Rajsthan has been divided by Prof. V.C. Mishra (1967) into seven Geographical Regions[1] in which Semi-Arid Region is one of them and our study area i.e. Shekhawati region is situated in the northern part of this region, respectively. After that Prof. R.L.Singh in 1971 divided the state of Rajasthan into four Geographical Regions[2] in which the area under study i.e. Shekhawati region falls under the region of Rajasthan Bangar Pradesh by covering partly or fully three 'sub-division' i.e. B-1 the NE Churu Region which includes nearly 20% portion of Churu district's total, B-2 the Western Sikar-Jhunjhunu plains covers about 70 percent of both districts, and C-1 the Sambhar-Didwana Region which contributes about 10% of the area under study.

It is very interesting and surprising to mention here that author's observations regarding the area, tehsils and districts coverage under the regional boundary of Shekhawati region that recently some researchers have done their Ph.D. thesis at the name of Shekhawati Region but they excluded the part of Churu district, which makes nearly 30% area of Shekhawati region's total.

Geological formations of the area under study may be divided into two distinct parts- the first part makes about 85 percent which is covered by Blown Sand, it is recent formations about one Lac years Ago whereas the second part makes about 15% area which falls under Delhi System formation about 45 Lac. years ago. Which the origin of upper Cambrian period. Delhi system of Aravallis is situated in south-west to north- east in direction.

Figure-1.2 shows the distribution of major physiographical formations in Shekhawati Region of Rajasthan which includes Sand Dunes, Sandy Plains with loose soil, Gravel and compact soil formations, Stony and Rocky (Hilly patches) topography, and Riverine as well as Aquatic formations, respectively.

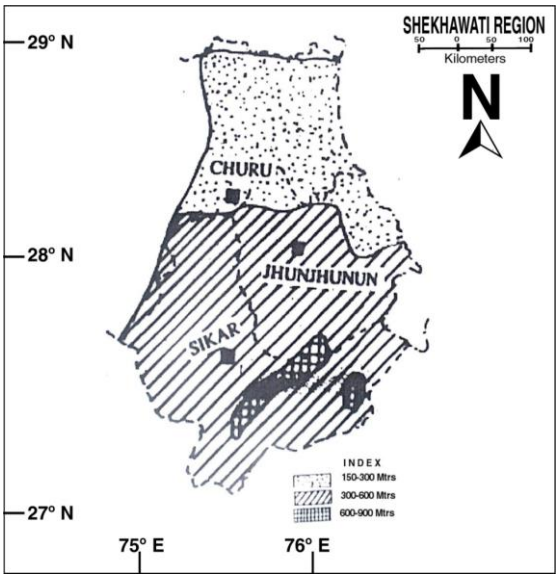
FIGURE- 1.2 DISTRIBUTION OF MAJOR PHYSIOGRAPHICAL FORMATIONS IN SHEKHAWATI REGION



The surface terrain, topographical fluctuation of the area under study is not thoroughly even but the relief decreases as one proceed from south to north in direction. It has three distinct areas of different elevations: (A). High altitudinal areas-

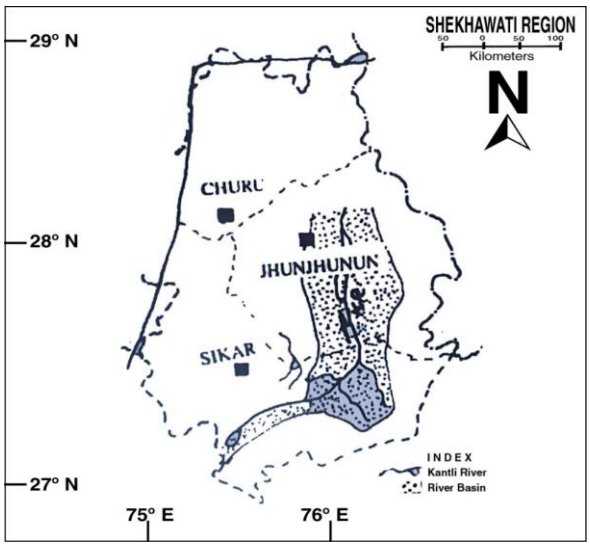
between 600 to 900 m. which lye in the southern part Shekhawati region, it covers two mountain ranges-first of Lohargarl range (in south-western site), and- second of Baghor range (in south eastern site of Jhunjhunu district), in Jhunjhunu district, about one-tenth portion of the study area falls in this part, (B). Medium altitudinal areas lye in between 300 to 600 m. and covers maximum area of the region, it covers most of the areas under sandy plains topography, about 60% of the region is covered under this height range whereas the (C). Low altitudinal areas lye in between 151 to 300 m. by height and mostly it covers the areas of sand dunes topography which is situated in northern part of the region under study. **Figure-1.3** illustrates the topographical fluctuation of the area under study from it's topographical fluctuation point of view.

FIGURE-1.3 TOPOGRAPHICAL FLUCTUATION IN SHEKHAWATI REGION



The region under study has four rivers viz; Lohargarl Ki Nadi, Chandrawati, Dohan and Kantli river (**Figure-1.4),** all these rivers have Internal Drainage system, and Kantli river basin is largest among them but covers only 1.4% area of the state's total under "Internal Drainage System." Most of these rivers have their location in southern part of study area. Hence, over all the Kantli Drainage system is significant in this aspect and it covers 4,677.80 sq. km. area.

FIGURE-1.4 DRAINAGE SYSTEM IN SHEKHAWATI



1.3. LAND USE ASPECT

Shekhawati region covers different kind of land use patterns which depend upon several factors and covers varied aspect of consideration. It has been observed by the earlier workers and researchers that it mainly depends upon the availability of soil and water resources in the particular area and the human endeavours to harness them. The region under study consists three districts - namely- Churu, Jhunjhunu and Sikar. These district have their own peculiarities as well as characteristics of

type of soil and water combination, hence overall land use for the region as a whole quite distinct in availability of differences.

The District-wise contribution in Land Use Pattern of Shekhawati Region. Due to non-availability of recent data of present years the author has taken the base of available data of 1994. The region understudy broadly consists six major patterns of land use type viz; Forest, Land Not Available for Cultivation, Other uncultivated land, Cultivable Waste, Follow Land and the land under Net area sown. The major patterns are also further divided into their sub-types of land use pattern but each pattern in details is not applicable from the them under study point of view.

The land use pattern under Net Area Sown ranks at first place which is followed by areas Fallow Land. The minimum contribution in this aspect is obtained by Cultivate waste i.e. only 2.8%. The land under Forest Area contributes 6.8% at the name of Forest cover. Land not available for cultivation and other uncultivated like "Pasture and Grazing" land also contribute at their parts accordingly. The author will not go in details for the descriptive account of each and every type of land use, for the reason the nature and characteristics of habitat type of Shekhawati Region is more significant here from phytogeographic pattern of distribution point of view rather than the land use type, respectively.

1.4. VEGETATION TYPE AND FOREST COVER

This much be know very well that not for only a phytogeographer from study point of view but the green cover wealth in the form of vegetation or forest have a vital role in the daily life living aspects for even a layman i.e. for human kind welfare point of view. From the commencement of daily life activities and at last end of the life - the plants have their applied values in numberless human activities i.e. way of existence of life style. Thus, the green coverage has it's own unique endeavour on this planet and to describe here in the following forth coming paragraphs we can divide in to three parts wise-type of vegetation, distribution of forest types and the forest cover for the area under study i.e. Shekhawati region, Rajasthan.

1. VEGETATION TYPES

The area under study has mainly five types of dominant vegetation which are as mentioned below -

A. Prosopis - Capparis - Zizyphus

Such type of vegetation namely - *Prosopis cineraria*, *Capparis decidua* and *Zizyphus numularia* has it's dominant distribution mostly in the middle part of Shekhawati region. Eastern part of Shekhawati region and Rajgarh tehsil of Churu district.

B. Prosopis - Acacia

Prosopis cineraria and *Acacia nilotica* are the dominant tree species which have their mostly distribution in north - western part of Shekhawati region by covering north-western part of - Sikar district and tehsil of Churu as well as Taranagar of Churu district.

C. Salvadora - Prosopis - Capparis

This type of vegetation also covers a large area of southern part and portion of Shekhawati region which is shown by empty places or areas. The particular type of vegetation has two tree species *Salvadora oleoides* and *Prosopis cineraria* and combination with a shrub species i.e. *Capparis decidua.*

D. Anogeissus - Euphorbia - Rhus

Actually, this type of vegetation is covered by hilly habitat of Shekhawati region. One can find it's dense distribution in southern part of Jhunjhunu district and northern part of Sikar district.

The vegetation type covers one dominant tree species i.e. *Anogeissus pendula*, with combination of two shrub species which are family - *Euphorbia caducifolia* and *Rhus mysorensis*.

E. Prosopis - Tecomella

The particular vegetation type has two dominant tree species namely - *Prosopis cineraria* and *Tecomella undulata*. As shown in earlier figure it is quite obvious that the particular type of vegetation has it's dense distribution at two areas - one is located in south - eastern part of Shekhawati region and another mid-southern part, respectively.

2. FOREST TYPES

The kind of forest types is naturally based on the climatic characteristics i.e. the type of climate for the area under study. Two types of forest coverage for the area under study which are as mentioned below -

A. Tropical Dry Deciduous Forest

As it's name denotes that the forest type is tropical according latitudinal belt but Dry due to desertic conditions and deciduous by nature due to the impact of seasonal changes in which 'leaf fall' take placed in a particular season of the year. Such kind of forest has it's dominant distribution in middle as well as western part of Sikar district.

B. Tropical Thorn Forest

It is again tropical due to latitudinal extension but the plant species are mostly thorny and spiny 'by nature hence in other words the forest type is also termed as "Thorny Forest". Such type of forest cover has it's vast coverage and mostly distributed in southern to towards eastern part of Shekhawati Region, Rajasthan. Thus, two types of forest-one by deciduous nature and another by thorny in nature, have their spatial pattern of distribution in the study area.

1.5. ECO-CLIMATIC CONDITIONS

As we know environment is a very complex sense coverage word, many Scientists, Climatologists and Environmentalists defined and tried their best to express its meaning, for example - Odum in 1971 defined that, " Environment is the surrounding complex of the nature in which each and every life form presents in its physical frame work". Thus environment has been divided three important parts - physical, climatic and biological. The components of physical factors in other words to say the topographical or physiographical features of the area under study which has already been described in the earlier chapter - second of the Research Project matter. The present chapter deals about the interpretation of the part of climatic conditions, among climatic conditions - rainfall, temperature and the relative - humidity are the significant as well as dominant components which play their important role in the distribution of life forms on this planet, with specific reference to plant species as well as existing vegetation.

By visualising the studies done by some plant geographers (phyto-geographers) and other authentic workers, Lawrence in 1951 put a frame work of the "principles of plant geography" on the basis of the work of Good (1931) and Mason (1936), he put fourth four groups of principles of plant geography in which Group - A, it deals about the "principles concerning the environment," this set or the group of principles includes total six principles in which the principle first, second sixth here are mentioned as : 1. Climatic control is primary, 2. Climate has varied in the past, 3. The environment is Holocentric. Thus, one can visualize very well the importance of the aspect of part of climatic conditions from phyto-geographic distribution point of view.

Climate is of three types - 1. Eco-climate 2. Bio-climate and 3. General climate. The Eco-climate means, the sum of total of meteorological factors with in a habitat, 2. Bio-climate is the climate in relation to the life forms particularly the plant life because most of the animals live in a special micro climatic conditions and are subject to migration, 3. General climate - It includes the climatic elements in broad sense like the distribution of rainfall, temperatures, etc. The particular chapter deals about the general climatic characteristics for the area under study i.e. Shekhawati Region, Rajasthan. Although the Indian sub continent has over all 'tropical monsoon' type of climate but the area under study has three distinct seasons in a year viz; the summer (March to June), the rainy season (July to September) and winter season (October-November to February).

1.5.1 CLIMATE TYPE

As far as the type of climate of the region under study is concerned, the observations revealed that according Koppens Climatic Classification, the region falls under 'Arid Type of Climate' (BWhw) - the upper part of Shekhawati region which includes three-fourth portion of Churu district) and 'Semi - arid type of Climate' (BShw) - it covers completely both of the districts i.e. Jhunjhunu and Sikar**.** According Thornthwait's Climatic classification point of view, the region under study is distinctly divided into two parts - Upper i.e. DBW Climatic region of Arid climate and Lower i.e. DAW climatic region which obtains Semi-arid Climate.

Commencement of monsoon period i.e. onwards period is very important for the reason that sudden increasement in rainfall as well as moisture percentage in the atmosphere as well as on the surface - numberless plant species specially 'ephemerals' sprout out as green cover. In other words to say arrival and growth of new - ephemerals take placed. This all take placed with the first rainfall of the rainy season i.e. from the month of either last week of June or first week of July.

The distribution of Monsoon Rainfall (June to September) which obviously illustrates that as if one proceeds towards northern part of arid-region for the area under study, the amount of rainfall (in cm) decreases. High rainfall (40 to 50 cm) obtains by the lower hilly terrain portion of Shekhawati region.

1.5.2. IMPORTANT CLIMATIC COMPONENTS

The forthcoming paragraphs of the head line covers the important climatic components which plays a vital role in the growth and development of plant life in Shekhawati Region viz; the rainfall, temperature, relative humidity and winds.

1. RAINFALL

The distribution of average annual rainfall in lower portion of the region under study obtains more rainfall (above 40 cm) rather than the upper part of low (below 30 cm.), respectively.

2. TEMPERATURE

At the part of distribution of Temperatures either in Summer season or in Winter season, the region under study has two distinct parts. In Summer season upper part receives more

average monthly temperatures i.e. above 40 ^{o}C**,** similarly the again in contrast, the upper portion of the region under study obtains low temperatures in Winter season i.e. below 6 ^{o}C**.**

3. RELATIVE HUMIDITY

Except during the brief south-west monsoon period when the relative humidities are above 60 percent, the air is generally dry. Even during the rainy period, the air is dries in between the rains. The summer is the driest period of the year when the relative humidities, particularly in the afternoons are below 30 per cent.

4. WINDS

Winds is also a prominent factor in nature which directly or in directly become basis or media of gaseous exchange, temperature exchange or to say winds becomes media for accelerating the rate of evapotranspiration in plants, it is the media of exchange the moisture conditions from once habitat to another, winds plays an active role in the phenomena of opening and closing of leaves stomata, it is the factor of wind which plays very vital role in dispersed of plants via their pareschutes like seeds formation, etc.

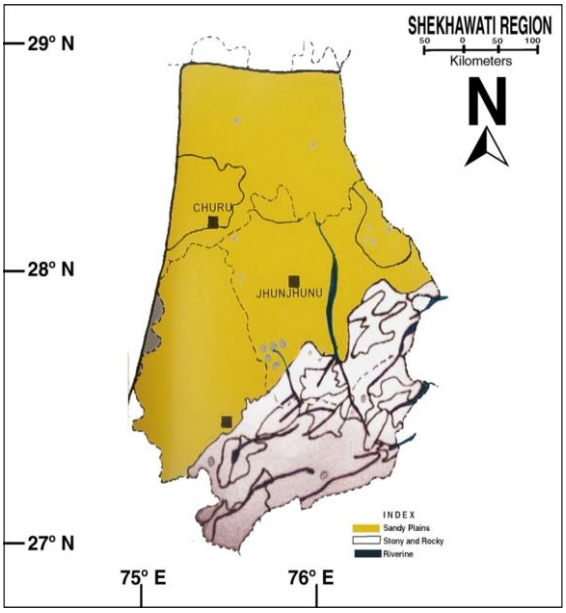
As we know the area under study lies under the system of monsoon winds which blown six months from sea to land surface (summer to rainy season) and remaining six months blows in opposite direction i.e. from land to the sea surface (in winter season) cold winds known as sheet lehar, thary, heel, dawa in winter where as hot winds known as Loo blow in summer season of the area under study.

During summer months wind velocity in creases to much extent and frequency of occurrence of dust storms take place and this phenomena in nature reaches or achieve the climax during the course of rainy season when the area experiences the prevailing of cylones or thunder storms of high wind velocity and results the damage of several trees uprooted and loss of flora and fauna of the area under study. In brief although air is a matter or a natural agent to experience it in directly manner but wind is that phase of air which we experience in a direct manner in the various activities of life system.

1.6. MAJOR HABITAT TYPES

The area under study has Three Major Habitat Types viz; I - Sandy Plains and Sand Dunes Habitat, II - Stony and Rocky Habitat, and III - Riverine and Aquatic Habitat. Sandy plains and sand dunes habitat rank at first place by covering about 60% of the total geographical area under study. The habitat of stony and rocky formations ranks at second place by covering about 32.5% of the total geographical area under study whereas only 7.5% is covered by riverine and aquatic habitat, respectively. **Figure-1.5** obviously shows the distribution of major habitat types of Shekhawati Region, Rajasthan.

FIGURE-1.5 MAJOR HABITAT TYPES IN SHEKHAWATI REGION



On the basis of the geographical spread of the area under study, the author has selected 23 Survey Spots to conduct the field study in which 16 survey spots fall under the habitat of sand dunes and sandy plains topography, 4 survey spots fall under habitat of stony and rocky formation whereas only 3 survey spot is covered by riverine and aquatic formations as shown in **Figure-1.6.**

FIGURE-1.6 SURVEY SPOTS/FIELD STATIONS IN SHEKHAWATI REGION

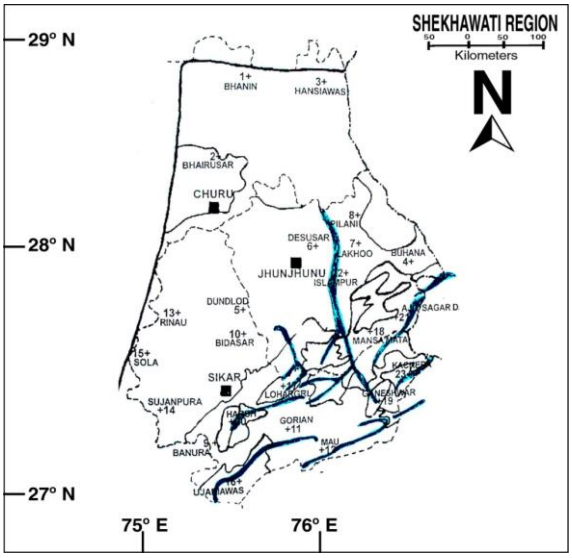


Table-1.1 deals about the district-wise names of the survey spots /field stations in Shekhawati Region, Rajasthan. By thus, it includes 3 survey spots under Churu district, 9 survey spots covered by Jhunjhunu district and 11 survey spots fall under Sikar, respectively.

TABLE 1.1 : DISTRICT-WISE NAME OF THE SURVEY SPOTS/FIELD STATIONS IN SHEKHAWATI REGION

S.No.	Name of the Survey Spot	Type of Habitat	Tehsil
1	Bhanin	Sand Dunes Habitat	Taranagar
2	Bhairusar	Sand Dunes Habitat	Churu
3	Hansiawas	Sand Dunes Habitat	Rajgarh
4	Ajit Sagar Dam	Riverine and Aquatic Habitat	Khetri
5	Buhana	Sandy Plains Habitat	Buhana
6	Dundlod	Sandy Plains Habitat	Nawalgarh
7	Desusar	Sandy Plains Habitat	Jhunjhunu
8	Islampur	Riverine and Aquatic Habitat	Jhunjhunu
9	Lakhoo	Sandy Plains Habitat	Chirawa
10	Lohargall	Rocky and Stony Habitat	Udaipurwati
11	Mansamata	Rocky and Stony Habitat	Khetri
12	Pilani	Sandy Plains Habitat	Chirawa
13	Banura	Sandy Plains Habitat	Data Ramgarh
14	Biddsar	Sandy Plains Habitat	Lachmangarh
15	Ganeshwar	Rocky and Stony Habitat	Nim Ka Thana
16	Gorian	Sandy Plains Habitat	Sri Madhopur
17	Kachrera	Riverine and Aquatic Habitat	Nim Ka Thana
18	Harsh	Rocky and Stony Habitat	Sikar
19	Mau	Sandy Plains Habitat	Shri Madhopur
20	Rinau	Sandy Plains Habitat	Fatehpur
21	Sujanpura	Sandy Plains Habitat	Sikar
22	Sola	Sandy Plains Habitat	Lachmangarh
23	Ujariyawas	Sandy Plains Habitat	Data Ramgarh

Habitat word is a broad in sense by covering two or more than two physiographical formations under them. The distribution of vegetation as well as individual plant species is controlled mainly by dominant the edaphic factor which naturally coincides with the particular type of physiographic formation.

REFERENCES

[1] Anonymous (1991) Nature and Extent of Biodiversity in Arid and Semi arid Region of India.-CAZRI Jodhpur.

[2] Bhandari M.M. (1990) Flora of the Indian Desert (Revised) MPS Report Jodhpur.

[3] Cain, S.A. and Castro, G.M.de O.(1959) Manual of vegetation Analysis. Arper and Row, U.S.A.

[4] Charan, A. K. (1992) Plant Geography, Rawat Publication, Jaipur

[5] Koppen, W.P. (1900) Versuch einer Klassification for Klimate, uorzugsweise nachihren beziehurgen zur planzenwett. Geogr. Z. 6:593-611..

[6] Sharma, M.K. (2007) Medical Plant Geography, Rachana Publications, Jaipur.

[7] World Resource Institute, (1992) World Resources. Oxford University Press, New York.