

# Geographical Distribution of Mineral Resources 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.

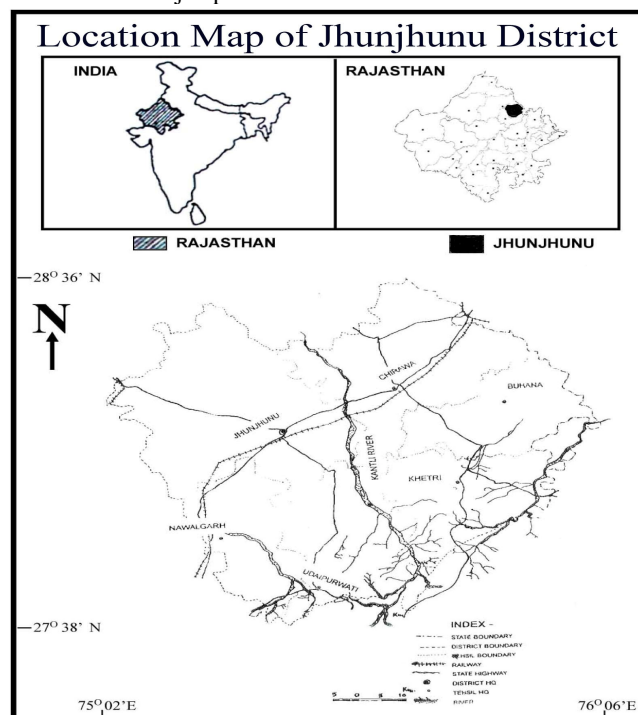
## 1.1. STUDY AREA :

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 peak 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 Shrimadhapur 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 Shrimadhapur 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 national 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 fodder to the animals supplying fuel for domestic purpose and checking soil erosion. Other species found are Babul, Shisham, Neem, Peepal, 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.

Locally the dust storm is popular by some names as : Andhi, Dhool Bhari Andhi, Andhar etc. It is also a popular proverb among native people of desert land that “the rain follows after dust storms.” In Rajasthan there are total 11 districts which fall under the western Rajasthan desert region which has arid and semi- arid climate types viz., Jaisalmer, Barmer, Bikaner, Ganganagar, Nagaur, Jodhpur, Jhunjhunu, Sikar, Jhunjhunu. Ajmer and Pali. Among these 11 districts area under study i.e. Jhunjhunu district, Rajasthan is fully or partly covered by desert conditions. The desert land of Jhunjhunu district has no river.

Some of the depression which originate in the bay of Bengal in the south-west monsoon season and move across the central parts of the county, reach the district during their last stages of activity and cause widespread rain before dissipating. An occasional post monsoon storm or depression also occurs in the district. Dust storms and thunder-storms occur in the hot season. Thunder-storms take place in the south-west monsoon season also. In the wake of western disturbances occasional fog occurs in the cold season.

Even during the monsoon period, the skies are only moderately clouded on many days and overcast or heavily clouded skies are seen only on a few days. For the rest of the year, skies are lightly clouded or clear except during the winter season, when

in association with passing western disturbances, cloudy skies appear for short spells of a day or two.

The district experiences very few thunder-storms. It has only about ten thundery days in the year, most of which occur in the period from May to September, But dust-storms are very frequent in this area, and it has eighteen days of dust-storms in the year. Maximum number of dust-storms occur in June but more or less continue up to September. The hailstorm, on an average of one in about three years, occurs generally in January, March and May and to a lesser extent in February. Fogs are reported mostly in the month of January.

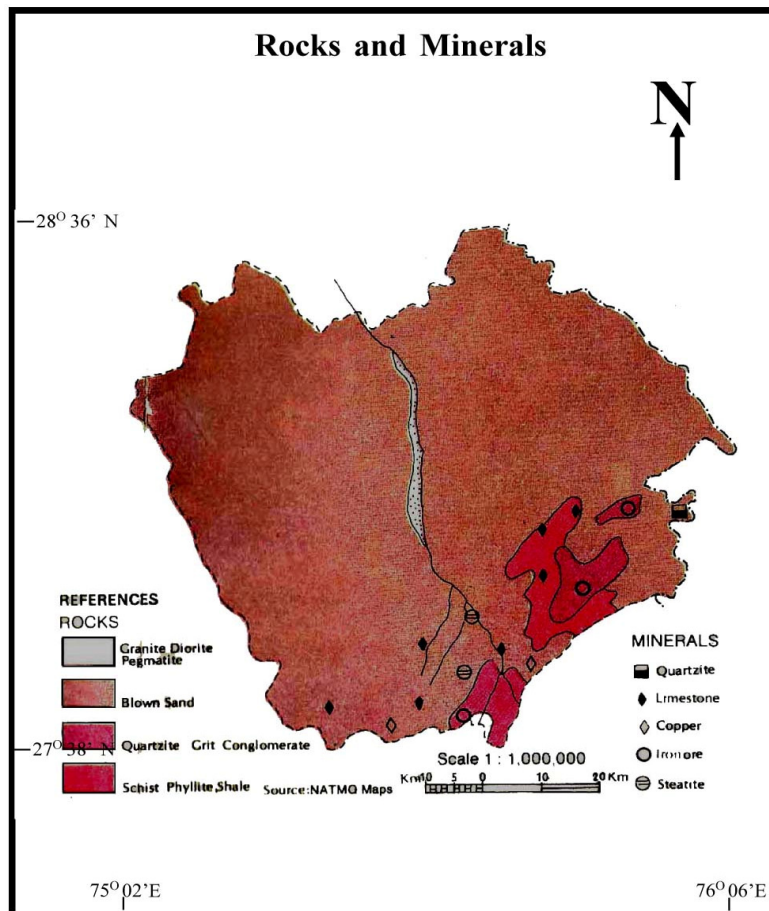
## **1.2 INTRODUCTION :**

The district is rich in mineral resource. The lime stone belt is situated at Nawalgarh block and Khetri block. The Arawali hilly is situated in the district Granite mineral protection at Jhunjhunu & Makher hill. The Cheja stone in the whole district. And Arawali hilly is also in the district. The soil of Buhana block is very good for mine bricks and other minerals also mines also actual Udaipurwati. South eastern part of the district Jhunjhunu in general is enriched with deposit of minerals resources. The famous Khetri copper complex is located where deposits of copper are extending in surrounding areas. For the exploration excavation development of mineral “Govt. of Rajasthan” has stated its mining office in Sikar which is having jurisdiction over both the district Sikar and Jhunjhunu. As per data available of mining office in Sikar district have been issued out this 405 lease have been issued for main mineral, 317 lease have been issued for main mineral that is located in Chand Mari Koliha Gothea, During the year 2010 Govt. Has Collected amounting to tune of 16886.32, 1076.65 lac Rs. As Royalty.

In Jhunjhunu district mineral based cement unit viz Triveni at Nawalgarh is in production. Raw material for this cement unit is mainly available in the village i.e. Kherod Deogon, Bajnagar, Parasrampura of Nawalgarh tehsil. In near future its expected that 0.75 units of lime stone based will be established. After lime stone granite is also available in Keharpura, Makhar of Chirawa tehsil and also available in Bamanwas and Begarao of Udaipurwati tehsil. In Jhunjhunu district 30 to 35 units are granite based units.

A Part from lime stone granite Cheja stone is also available in Modapahar, Kanaha pahar, Chobari Mandi, Derwal Jhunjhunu Tehsil Jhunjhunu Akiawali Pahari, Dohargal of Nawalgarh Tehsil and also available in Deoroad, Pilani pahari of Chirawa Tehsil, Modi Chumida Tehsil Khetri. Marble Stone is also available in papurana, Jodhan ki Dhani, of Khetri Tehsil and Chhapoli of Udaipurwati Tehsil. In future marble units will also come up in the district.

Other principal mineral are Fluorite iron or dolomite and lime stone. The calcite Soapstone, beryta, quartz, silica sands, pyrophysisters and fire clays are available. It is important to note here that the production of good quality of marble and granite has been started in districts which have great scope. Besides the cobalt silver and traces of gold are associated with the copper are the concentration of these mineral is in Khetri Udaipurwati Tehsil.



Physiographically the district is a mass of rolling sand dunes, hillocks and low lying mounds in its western part. The south eastern part, has off shoots of Aravalli range of hills, which extend from south of Udaipur wati tehsil and continue up to Khetri & Singhana following an almost NE-SW trend. The average elevation is 300-450 mt. above MSL with highest peak near Lohagarh at 1051 mts. above MSL. Shifting sands, active dunes and soil eroded are hallmark of western and central part of the district. The inland drainage is related to Kanllu river system. There are four major streams in the district namely Dohau, Chandrawati, Udaipur-Lohagarh ki Nadi & Sukh Nadi. The ground water table, varies from 5 to 45 mts.

Geologically the district is covered by wind blown sand except for a linear outcrop of Aravalli mountain system trending NNE-SSW. These are exposed from south of Udaipurwati in SSW to Singhana in NNE for a strike length of about 70kms. and the width is about 20kms. in north and about 5 kms. in south. Apart from these, small isolated outcrops of the rocks of Delhi Supergroup and Malani Igneous suite are found around Bhurri, Jhunjhunu, Baggar, Makhar Nand, Risora, Rizhani etc. The general geological succession of the district is as follows :

Recent - Alluvium, Aeolian sand  
 Post-Delhi - Pegmatite- Erinpura Granite,  
 Intrusives - Epidiorite, dolerite, albitite, granite (Malani Igneous Suite) amphibolite.

Ajabgarh Group -Phyllites, phyllites interbedded with quartzites, biotite schist, calcgneisses etc.

Alwar Gr Group - Quartzite, schist, flaggy quartzite, grit, arkose, felspathic quartzite etc.

Group - Pre-Aravalli Basement - (unexposed)

The Alwar group of rocks are extensively exposed in the South - Eastern part of the district around Udaipurwati. These are also exposed in the NorthEastern part of the district around Khetri but here they are thin and narrow. Around Udaipurwati, the Alwars are exposed in the central part of the basin with the Ajabgarhs being exposed along the basin margins. The Alwars are represented by grit, arkose, felspathic quartzite, conglomerate, pebbly quartzite (with iron ore), flaggy quartzite, massive quartzite with minor schist and phyllites. These have been intruded by post Delhi intrusives such as amphibolite granite, pegmatite, quartz veins etc.

The Ajabgarhs are continuously exposed from South of Udaipurwati to Gudha Ponkh and reappear from Babai to Singhana. Between Gudha Ponkh to Babai, isolated outcrops of the Ajabgarhs are exposed.

The Ajabgarhs are represented by limestone, dolomite, impure crystalline siliceous limestone, calcgneisses, schists, phyllites, carbon phyllites, interbedded quartzites and phyllites, quartzites, orthoquartzites, tremolite marble etc. intruded by post Delhi intrusives viz. Amphibolite, granite, albitites, pegmatites, epidiorite, quartz veins etc.

The post-Delhi intrusives of acidic as well as basic type are exposed throughout the Delhi group of rocks exposed in the district. These have been themselves subjected to further metamorphism.

The basic intrusives include epidiorite, diorite amphibolite etc. which are fine grained massive and melanocratic. A large body of these intrusives is located around Babai while small outcrops are found near Udaipurwati, Bagora Papurna etc. The granite, albite and pegmatite intrusives are extensively exposed in the area. The albitites are profusely intruding the Ajabgarhs in the area and appear to play an important role in the copper mineralisation in Khetri area. The granites are emplaced along the core portions of Alwas as well as Ajabgarhs. Extensive outcrops of the same are seen around

Bagora, Udaipurwati, Manaksas, Bagoli, Mandaora, Gudha-Gaurji and Hukumpura Bamlawas. These granites belong to the Erinpura group of granites while the granites belonging to the Malani Igneous Suite are exposed around Jhunjhunu, Kalipahari, Bakra, Makhar, Nand, Rasora, Rizhani etc. The pegmatite bodies have discordant relationship with the granites, suggesting a later emplacement of the former.

### 1.3 MINERAL PRODUCTION :

The production of various minerals explored in Jhunjhunu district during the year 2009-10 given in Table-1.1.

**TABLE 1.1 DISTRIBUTION OF MINERAL PRODUCTION(2010)**

S.NO.	MINERAL LEASE	REVENUE	ROYALTY PRODUCTION 2009-10(M.T)
1.	Lime Stone	3 5.50	9378
2.	Marble	5 4.50	1819
3.	Granite	20 30.45	17.76
4.	Cheja Stone	317 403.00	3561709
5.	Min.Bricks	60 71.00	-
<b>Total</b>		<b>405 514.45</b>	<b>3574682</b>

### 1.4 MINERAL RESOURCES :

Jhunjhunu is fairly endowed with various minerals whose industrial use has immensely contributed to the economy of the district. Of these, the most important is the copper belt of Khetri from which mining has been carried out since time immemorial. The different minerals found in the district can be enlisted as under:-

#### 1.4.1 COPPER-GOLD-SILVER :

Out of the three copper producing belts of India, the Khetri copper belt has a special importance due to the ancient workings and its configuration. The Khetri Copper belt extends for a strike length of 80 kms. from Raghunathgarh in South to Singhana in North. The off-shoots and parallel mineralised zones have been identified around Deoru, Banswas, Dhola Mala etc.

#### 1.4.2 KHETRI COPPER BELT :

The main ore producing centres in this belt are Madankudan, Kolihan and Chandmari which consist. of about 120 M.T. proved reserves containing 0.88% to 1.4% Cu. Another 46.60 M.T. probable reserves with average 0.91% Cu. have been further assessed from these areas. The copper

concentrate produced at the Khetri Copper Smelter also contains 1-2 gm. of Gold and 8-10 gm. silver per tonne; which is being extracted as a by-product. The mining and further exploration activities are being carried out by M/ s. Hindustan Copper Limited.

Apart from these, smaller deposits, within this belt have been explored by various agencies viz. state Department of Mines & Geology, G.S.I., M.E.C.L., A.M.S.E. etc.

Due to their efforts the following prospects have been further proved :

Akwali - 1.65M.T. proved reserves, 1.5% Cu.

Satkui - 3.88 M.T. proved reserves, average grade of 1.19% Cu, 200-300 ppm. Co, 50-150 ppm Ni, 0.5 to 1.5 ppm Au and 2-8 ppm Ag.

Karmari - 5.2 M.T. reserves with 0.51% Cu.

Banwas - 1.37 M.T. reserves with 2.33% Cu.

Apart from these mineralized zones have been located near Dhanota, Kakrana, Naveri, Gorla etc. in which further exploration activity is being carried out.

**TABLE 1.2 STATISTICAL INFORMATION**

S.No.	Minerals	No. of Leases		Production (thous. tonnes)		Sale value (thous. Rs.)		Revenue (thous. Rs.)	
		2000	2008	2000	2008	2000	2008	2000	2008
<b>Major Mineral</b>									
1.	Quartz	5	5	1.80	0.772	79.4	96.50	-	107.78
2.	Soapstone	5	5	1.90	0.384	25.5	53.70	108.81	46.56
3.	Fireclay	5	3	7.50	0.858	51.7	77.20	48.04	24.55
4.	Calcite	5	3	0.01	0.164	1.50	45.10	177.13*	-
5.	Silica sand	-	-	0.02	-	1.6	-	-	47.62
6.	Copper Ore	4	4	1804.3	1471.04	586404	463365	2502.29	45558.4
7.	Lime Stone	1	1	32.4	8.62	1121.4	1034.4	2506.51	167.55
8.	Iron Ore	5	5	1.2	0.269	100.32	33.6	79.66*	94.53
9.	Dolomite	2	2	-	-	-	-	-	12.79
10.	Pyrophyllite	2	2	-	-	-	-	91.62	-
11.	Red Ochres	-	1	-	1.358	-	149.30	-	33.16
12.	Gold (Kg.)	-	-	-	269.113	-	-	-	2394.98
<b>Minor Mineral</b>									
1.	Lime stone	9	11	72.7	60.41	980.9	6645.30	2472.89	4134.36



	(Burning)								
2.	Granite	33	29	4.8	5.42	362.9	1010.50	-	831.90
3.	Brick Earth	2	-	1.5	-	3.8	-	14.89*	457.34
4.	Marble	12	27	4.8	1.67	346.4	268.0	-	999.18
5.	Kanker /Bajari	-	-	499.9	-	1249.9	-	2641.85*	2314.32
6.	Masonry Stone	54	89	394.3	53.88	995.8	5388.8	1832.63*	3958.79
7.	Quartzite	-	1	-	-	-	-	-	-
8.	Patti/ Katala	-	1	-	-	-	-	-	-
9.	Fullers Earth	-	-	-	-	-	-	-	63.15

#### 1.4.2 IRON :

Iron ore in the form of a mixture of haematite and magnetite occurs near Jaonda where about 0.25 M.T. of reserves with 65% to 70% Fe have been estimated. Micaceous haematite has also been found in this area. Another 0.38 M.T. reserves with 55% - 65% Fe have been reported from Soir Zamalpur area. Minor occurrences have been also reported between Rajpur and Jaintapura and Kali Pahari area.

#### 1.4.3 COBALT :

G.S.I. has reported presence of Cobalt associated with pyrrhotite in Akwali - Babai section of Khetri Copper belt. The ore is a mixture of Cobaltite and Danite with about 2.83% Co content.

#### 1.4.4 LIMESTONE :

Limestone is reported from Khiror-Basawa-Parasrampur area, teh. Nawalgarh, It occurs beneath a thick soil cover and only intermittent exposures are found. This limestone band extends for about 10 km. strike length and a small part of it is leased out. In the surrounding areas, prospecting by the state department of Mines and Geology has established a strike length of 1900 meters with 164 M.T. reserves, taking 60 mts. thickness of the band. The limestone is grey to dark grey, medium grained, crystalline and contains 44% to 53% CaO with 0% to 13% SiO<sub>2</sub> and upto 3% MgO. Small occurrences of limestone are also reported in the form of small bands and pockets around Paprna, Meena Ki Dhani etc.

#### 1.4.5 FLUORITE :

A small occurrence of fluorite is located near village Chhapoli, Teh. Udaipurwati. This prospect was worked by R.S.M.D.C. previously, though no mining activity is being carried out now.

#### 1.4.6 QUARTZ – FELDSPAR :

Minor occurrences of quartz-feldspar have been reported from localities in teh.Khetri and teh. Udaipurwati. .

#### 1.4.7 CLAYS-RED OCHRE :

A few leases for clays and red ochre are existing in the district near Gudha, Ponkh, Girawadi, Udaipurwati, Mehrana etc.

#### 1.4.8 SOAPSTONE – PYROPHYLLITE :

Soapstone-pyrophyllite occurrences have been reported from Khoh, Guda, Mehrana etc. of teh. Udaipurwati and Khetri.

#### 1.4.9 CALCITE :

Calcite is being mined in minor quantities around villages Dada, Bansiyal, Badalwas etc. of teh. Khetri.

#### 1.4.10 GRANITE :

Granites belonging to the Erinpura as well as Malani Igneous suite are exposed intermittently in the district. The prominent exposures are of Nand, Rizhani, Maragsar, Makhar, Rasoda & Jhunjhunu of teh. Jhunjhunu and Hukumpura Bamlawas, teh. Udaipurwati. Granite leases are in operation in these areas from which blocks of sizes upto 3 x 1.5 x 1.5 mts. are being excavated. The granite of the district is light to dark grey pink

and red. The red granite of Makhar is also being exported. A total of 31 plots are existing in the district.

#### 1.4.11 MARBLE :

Marble occurrences are reported from Papurna, Meena Ki Dhani, Bhagwatwala ki Dhani etc. of teh. Khetri. The marble is grey, medium to coarse grained, hard and compact. The block size is upto 2.5 x 1 x 1 Tilt. in these areas. A total of 27 plots are presently existing in the district.

#### 1.5 MINERAL BASED INDUSTRIES :

The district consists of 1 large scale unit, 7 medium scale units and 1374 small scale units at present. The large scale unit is that copper smelting of Hindustan Copper Ltd., Khetri, which has a capacity of 31000 TPA. Out of the 7 medium scale units, 5 are cement plants, viz.

1. Thar Cement Ltd., Sitapur- Jhajhar- Teh. Nawalgarh.
2. Chinar Cements, Basawa, Teh. Nawalgarh.
3. Moti Cements, Jhunjhunu.
4. Shakambhari Cements, Sonasar, Hamiri Road, Jhunjhunu.
5. Gupta Cements, Chirawa.

The 1374 small scale units consist of 71 granite cutting - polishing units (31 Chirawa and 40 in Jhunjhunu ) and about 5-6 stone crushers, apart from other Agro Industries, Steel, Cattle feed, pipes etc.

There is scope for setting up of granite cutting polishing units, stone crushers and cement plants based on Basawa limestone deposits.

Mineral administration work in the district is looked after by mining engineer Sikar. Which is under Suptdg. mining engineer Jaipur region. The geological work is carried out by office of Superintending geologist Jaipur.

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