

Government of Jammu and Kashmir



District Survey Report of Ganderbal

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Introduction

The Government of India, Ministry of Environment, Forests and Climate change has made certain amendments in, Environmental Impact Assessment (EIA) Notification No.S.O.1533 (E) dated 14.09.2006 issued by the erstwhile Ministry of Environment and Forest. , vide notification no. S.O.141 (E) dated 15.01.2016 and notification no. S.O. 190 (E) dated 20.01.2016. These amendments led to the constitution of the District Level Environment Impact Assessment Authority (DEIAA) at district level for grant of environmental clearances for category B2 projects (B2 category projects pertaining to mining of minor minerals of lease area less than or equal to 5 hectares) for mining of minor minerals, for all the districts in the country.

DEIAA comprises of following members:

1. District Magistrate or District Collector of the district - Chairperson.
2. Senior most Divisional Forest Officer in the district - Member.
3. An expert member to be nominated by the Divisional Commissioner or Chief Conservator of the Forest - Member.
4. Sub-Divisional Magistrate or Sub-Divisional Officer of the district head quarter - Member Secretary.

The DEIAA shall base its decisions on the recommendations of District Level Expert Appraisal Committee (DEAC). It comprises of following members:

1. Senior most Executive Engineer, Irrigation Department - Chairperson
2. Senior most Sub-Divisional Officer (Forest) - Member.
3. A representative of Remote Sensing Department or Geology Department or State Ground Water Department to be nominated by the District Magistrate or District Collector - Member.
4. Occupational health expert or Medical Officer to be nominated by the District Magistrate or District Collector - Member.
5. Engineer from Zila Parishad - Member.
6. A representative of State Pollution Control Board or Committee - Member.
7. An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest - Member.
8. An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest - Member.
9. An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest - Member.
10. Senior most Assistant Engineer, Public Works Department - Member
11. Assistant Director or Deputy Director or District Mines Officer or Geologist in the district in that order – Member Secretary.

District Survey Report (DSR) is required to identify the areas of aggradations or depositions where mining can be allowed and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area. The District Survey Report (DSR) shall form the basis for application for environmental clearance, preparation of reports and appraisal of projects. The Report shall be updated once every five years.

Brief History of the District

The word Ganderbal could be coincided with two words “Gander” which means warriors and “Bal” which means bank of water body where people accustomed to wash, bath and, take their cattles for drinking water. Another saying is that Ganderbal is named after Ganderee or Tulree or Bees and “Bal” means abode or house that is why Beehama, the main market of Ganderbal is named after translation of Ganderbal into (House of Bees by English). In earlier times, Ganderbal had been the base camp for traders and their caravans who travel back and forth Central Asia, Yarkhand and South-Asia especially Northern India. The caravans of horses/ponies used to base their camp and stay at Ganderbal. The present Guzarbal was the place of octroi of goods coming through the way from Ladakh. Later on Ganderbal became a recognized health resort by English people for its amazing picturesque surroundings. Historically, it is also said that a small village settlement was located on the left bank of the river Sindh, at the western extremity of the valley. The villagers of the village settlement used water transport as main means of communication. Royal people of English Rule and Maharaja Rule who used to come to Dewan Bagh and Chinar Bagh (present Town Hall and Physical College) had been the sage of Darbar of Maharaja from here he used to visit Khirbawani, a place of Hindu Pilgrimage, early in the morning with his wazers. Ganderbal settlement recorded widespread expansion after the opening up of Srinagar–Leh National Highway that passes through it and was further boosted by the development of Sonamarg as a tourist spot.

The district abounds in the places of the historical, religious and archaeological significance, the important among which are Qamar Sahib Shrine, Khir Bhawani Temple, Sonamarg, Naranag, Manasbal lake and some fresh water lake like Gangabal, Nanda sar lake, Gada sar lake, Vishan sar lake and Kishan sar lake. The presence of famous health resorts, Sonamarg and Mansbal lake and Sindh river adds to its beauty. In addition, location of Kheer Bawani, Hindu Religious Place in its vicinity and opening of Baltal route for Amarnath Yatries has further added to its significance

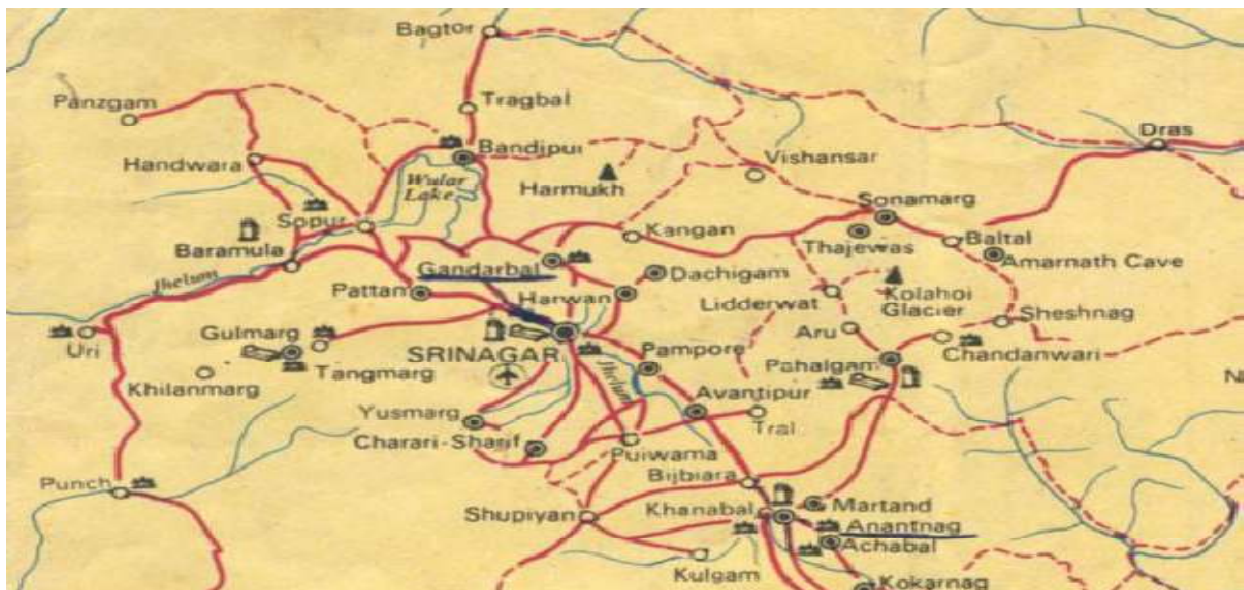
The district Ganderbal is among the eight newly created districts that came into existence in 2007 by deletion of areas of Ganderbal and Kangan from erstwhile Srinagar district. It has a great exposure in adventure tourism. The nature has been generous in gifting the district with places of unparalleled beauty. It is obvious to call it as the district of lakes, as it possesses the most number of lakes in the whole state. Farming in Ganderbal is the main occupation as more than 80% of the working population is engaged with it, thus has made district Ganderbal as one of the important district of Jammu and Kashmir. The main income of the district comes from agriculture for which land has been put to use about 5758 Hectares. However, the district Ganderbal is on the path of the industrialization. Despite topographical limitations, Industrial Sector has been declared as main vehicle for accelerating economic activity besides providing employment to the unemployed youth.

Location and Accessibility

Ganderbal town is located on the both banks of River Sindh at an elevation of 1590 meters above mean sea level between $N 34^{\circ}12'53.45''$ North latitude and $E 74^{\circ}46'06.47''$ East longitude. District Ganderbal is situated north of the Srinagar City at a distance of 22 kms along Srinagar – Leh National Highway. The nearest Airport is at Srinagar, which is at a distance of about 30 kms from District Head Quarter.



Location of Ganderbal Town



Linkages and Connectivity of Ganderbal Town

Geographical Set up

The Ganderbal district is flanked by district Baramulla in the west, district Srinagar in the south, newly created district Bandipora in the North West, Arohoma forest in the north and district Kargil in the east. The Ganderbal district enjoys a unique geographical position and it represents the last station depicting all the scenic features of the Kashmir valley.

Climate and Rainfall

The Ganderbal District experiences chilling cold during winters while, as the spring and the summer are very pleasant. The temperature ranges from $-10^{\circ} C$ to $30^{\circ} C$. The main precipitation of the area is in the form of snow during the winter and rains during spring and summer. The average annual precipitation (rain and snow) in Ganderbal varies from 500 mm to 550mm. The strong northwesterly winds are more predominant with average wind velocity of 12 – 30 kms per hour. The presence of Zaskar Mountains in the west and north and north east produce substantial impact on the climate, wind direction, speed and precipitation.

Rainfall Statistics of District Ganderbal 1980-2016

Month	Rainfall (in mm)
January	68.1
February	93.3
March	124.7
April	100.8
May	71.4
June	47.6
July	87.5
August	82.7
September	40.9
October	31.6
November	25.3
December	45.9

Fauna and Flora

The fauna of the Ganderbal District include bears, monkeys and snakes. Chakor and partridges are also quite often during summer. The Ganderbal district is densely forested, vegetation is generally supported on slopes comprising mainly conifers and other plants. The forests are composed dominantly of conifers with the flora mainly consisting of *Pinus longifolia* (Chir), *Cedrus deodara* (deodar) *Abies* (Fir), *Juglans regia* (Walnut), Poplar, Chinar and willow.

Hydroelectricity

The Sind River, a major tributary to the Jhelum River flows through this district. The water of the river is mainly used for irrigation, and generation of hydroelectricity. There are three hydroelectric power stations,

1. Lower Sindh Hydroelectric Power Project Ganderbal,
2. Upper Sindh Hydroelectric Power Project 1st Kangan and
3. Upper Sindh Hydroelectric Power Project 2nd Sumbal, generating electricity on the Sindh River.

Physiography of the District

Ganderbal District as a whole can be sub-divided into three physiographic units, plains, foothills and upper-hills. Ganderbal town is predominantly located in the plain area, which extends from Shalbug in south and Manigam in north. The foot-hills include the uplands which bound the town in east and north-east adding aesthetic beauty to the township. District Ganderbal has conspicuously different physiographic, tectonic and stratigraphic setup as the district is situated mostly amidst the young, active and fragile mountains of the Himalayas. The District is a hilly terrain, as such mining of mineral in Himalayan terrain, is constrained not only because of geo-technical complexity of the deposit but also due to the environmental challenges they pose. The E-W trending mountain ranges giving rise to a rugged topography with steep escapements. The Ganderbal district is bounded on the west with recent alluvial fill deposits of Sindh river and famous Manasbal Lake while as, on the East and North East are surrounded by lofty snow fed Himalayan mountains which form dendritic and trellis type of drainage pattern suggestive of homogeneous lithology which is structurally controlled. The Karewas lie unconformably cover the older Mesozoic rocks. The valleys are usually 'U' shaped. The main drainage in the area is the Sindh River flowing E.S.E.-W.N.W direction. A number of minor *nalas* and streams, flowing in north-south and south-north directions, feed the Sindh River. Most of these streams originate from different glaciers in the higher reaches, and as such, these are of perennial character.

General Profile of the District

District Ganderbal has 2 Assembly Constituencies Kangan and Ganderbal, and one sub-division Kangan.

The District Ganderbal has 6 Tehsils

Serial .No	Name of CD Block
1	Lar
2	Kangan
3	Wakura
4	Gaderbal
5	Tulmulla
6	Gund

The district has 115 inhabited and 2 un-inhabited villages. It has nine CD Blocks namely

Serial .No	Name of CD Block
1	Lar
2	Kangan
3	Wakura
4	Gaderbal
5	Tulmulla
6	Gund
7	Shearpathri
8	Manigam
9	Phaag

Demography

Demography is the study of Human population dynamics. Demography plays an important role in the field of analysis and prediction of Human settlement systems. The analysis of Demographic patterns and factors can give an excellent understanding of the present nature of social, economical and industrial development of the settlement under consideration and pave way for reliable predictions of future population of settlements for allocation over the spatial and urban fabric.

There are six tehsils in the district, the total population of the district is 297446 persons spread over 113 villages as per 2011 census. Ganderbal Planning Area had a population of 46,885, which constitute 59.3% of urban population including 6-outgrowths and 40.7 % of rural population. The Ganderbal Planning Area includes Ganderbal Municipal Committee Area and 12 villages in its proximity.

Population Total Persons 297446

✓ Males	158720
✓ Females	138726
<u>Urban Persons</u>	<u>47039</u>
✓ Males	25005
✓ Females	22034
<u>Rural Persons</u>	<u>250407</u>
✓ Males	133715
✓ Females	116692

Source: Census 2011

Overview of the Mining Activity in the District

Overall mining activity in Ganderbal District is running in full swing in term of minor mineral (building and road material). Minerals found in Ganderbal district are mainly Limestone and basalt. The Late Triassic limestone seems to be of high grade and may probably yield some bands suitable for the manufacture of Portland Cement.

Building materials like aggregate, sand, nallah boulder nallah bajri, crushed bajari, clay, RL. Stone M. Stone, nallah much and c/dust are also found in enough quantity. The local residents used to lift sand from the Jhelum riverbeds to meet out their bonafide requirement.

Process of Sediment Deposition in the Rivers of the District

Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water and/or by the force of gravity acting on the particles. Sediment is transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow.

If the upwards velocity approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load.

If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move, it will move along the bed as bed load by rolling, sliding, and saltating (jumping up into the flow, being transported a short distance then settling again).

If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load. As there are generally a range of different particle sizes in the flow, it is common for material of different sizes to move through all areas of the flow for given stream conditions.

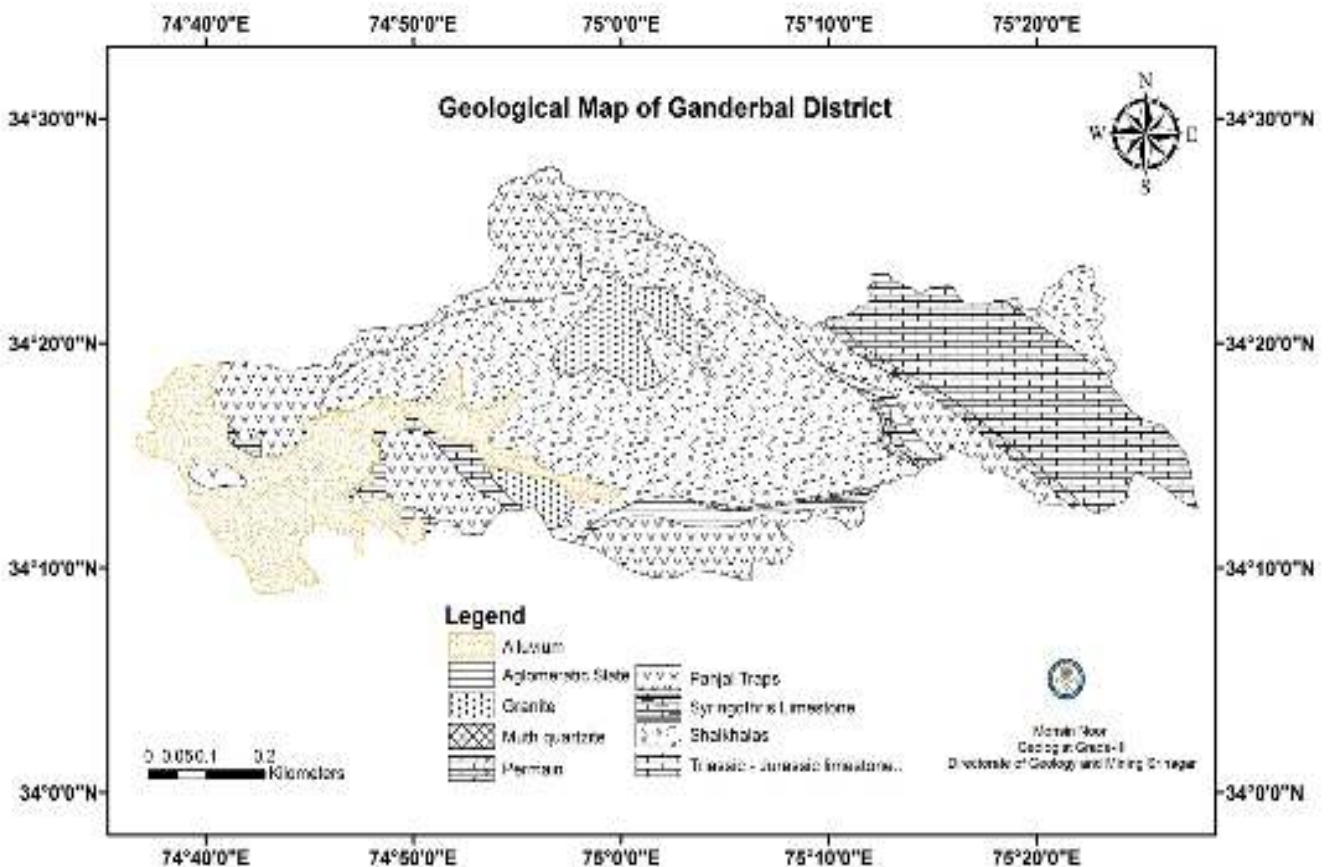
The rivers are the most important source of Sand. It acts as source of transportation and deposition of sand and Bajri etc. The major rivers of the district are Sindh and Jhelum. Sindh River divides the district into two parts as it flows through the centre part. It is the lifeline for the Ganderbal district. Farmers take crop, irrigated through Sindh and Jhelum River. The Sind River carries lots of boulders, bajri, nallah muck and Sand as it flows like a serpent through the Himalayan terrain and finally drains its load to Anchar Lake, where from it again flows towards north-west direction and finally confluence with Jhelum at Narayan Bagh. It is shallow in depth but sometimes it creates havoc/flooding during torrential rains.

Geology and Mineral Wealth of the District

The oldest formation covering a large part of the Ganderbal District is that of the *Shalkhalas*. The formation comprises slates, shales and phyllites with interbedded quartzite and limestone. The slates are argillaceous to arenaceous and dull pale or drab, at places showing various shades of bluish grey or pale green colours. The slates gradually change into phyllites. The *Muth Quartzite* comprises milky white thick to thin bedded quartz arenite and is well exposed along the left bank of river Sind toward Sonamarg. The *Carboniferous lithology* developed to the lesser extent in the Sind Valley. These rocks have been classified into *Syringothyris Limestone* and *Fenestella Shale Formations*. It consists of limestone, sandstone and shale. In Gund-Gagangir Sector of Sind valley the *Agglomeratic Slate* have a wider distribution around Basmal in the eastern part of the Sind valley. The *Panjal Trap* is a hard, massive, fine to medium grained and dark olive green in colour. The mineral constituents consist of feldspar, olivine and pyroxene. The Panjal trap consists of a series of altered lava flows, andesitic to basaltic in composition that show felsitic texture. The *Permian* rocks comprises of complex lithology and has been reported from upper Sind valley. The *Triassic limestone* most widely distributed formation in District Ganderbal is the dull bluish grey limestone of Late Trias age, which conformably overlies the Middle Trias with a fairly sharp contact. The formations have eye catching exposures on either side of the Sindh river from Sonamarg to Baltal. The limestone is massive and generally grey to blush grey in colour but shades of pink and dirty white are also seen at few places. Cubes of iron pyrites, disseminated

in the limestone, are also present rarely. The Late Triassic formation have been thrown in to a number of tight folds. It has attained its large width, on account of the repetition of beds by these folds. Kangan Granite (*Tethyan Granitoid*) exposed as two main bosses. The first one is just to the north and northeast of Wangat and the other on both sides of Sindh River near Kangan. The larger of these two bodies exposed near Wangat occupies an area of 75 sq km. It is intrusive into Lower Cambrian Kangan Formation and is dated to be 500 ± 10 Ma.

The *Alluvium* mainly comprises terrigenous clay, silt, gravel and boulder in order of predominance is unconsolidated in nature.

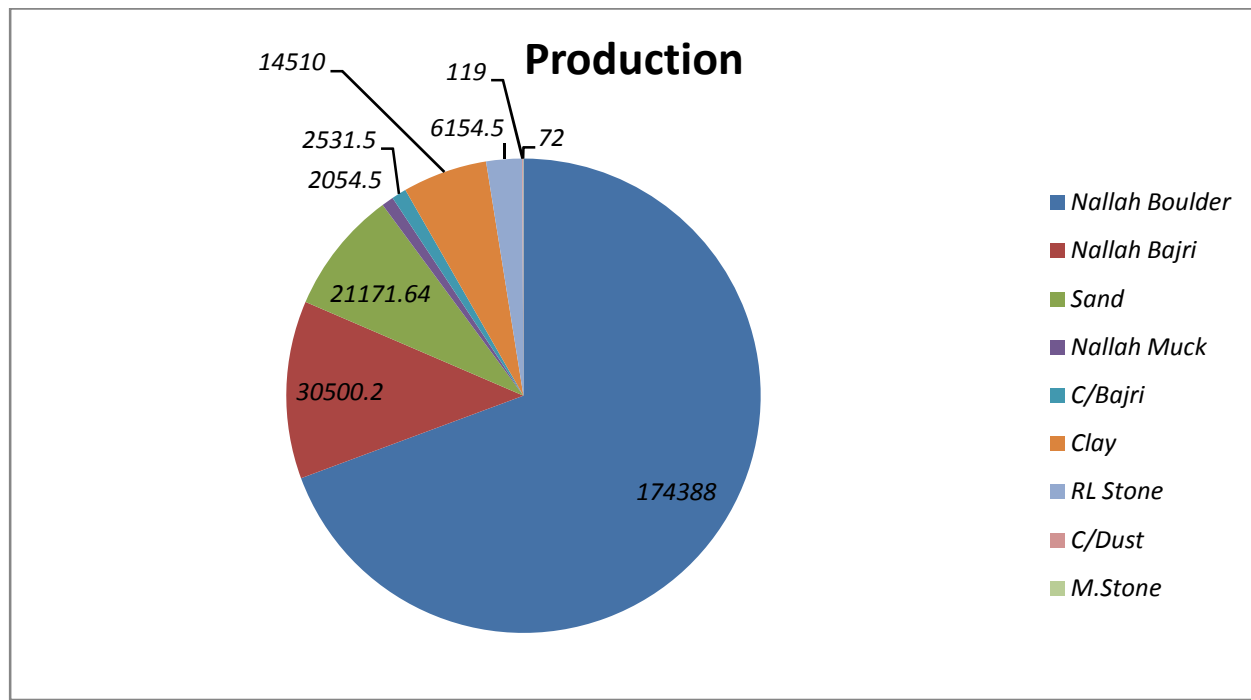


Details of Royalty or Revenue received in last three years

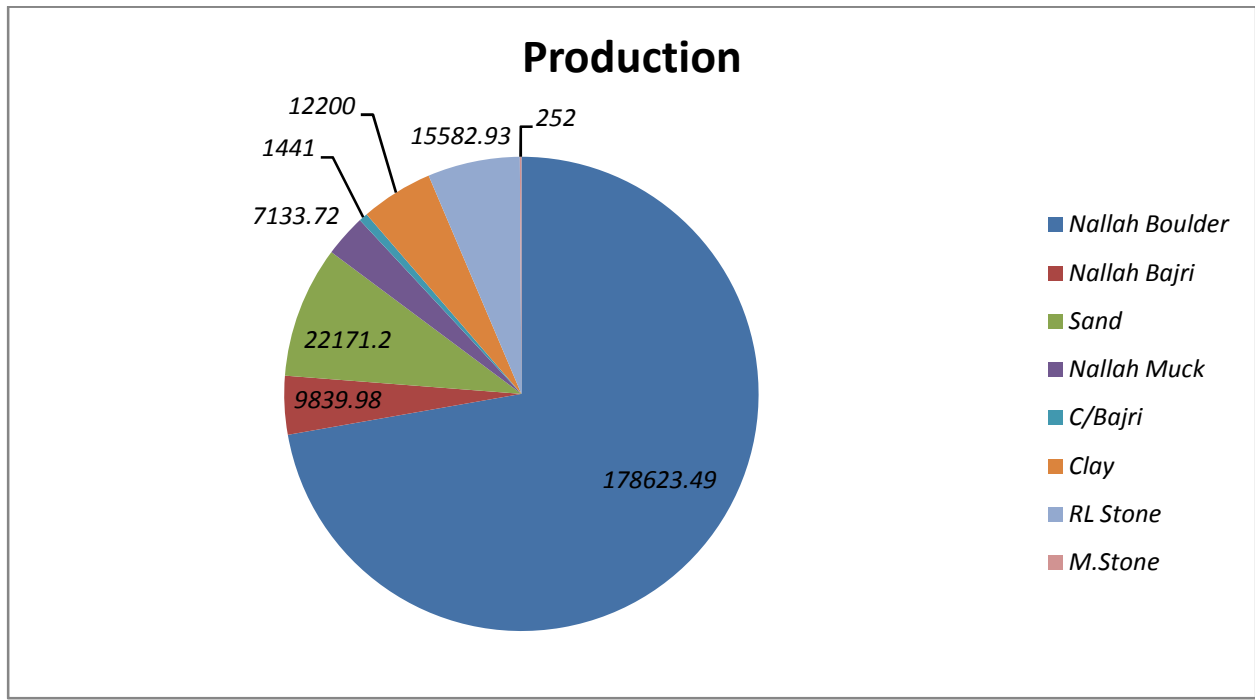
<u>Financial Year</u>	<u>Royalty</u>
2014-15	38, 12,115/=
2015-16	37, 04,176/=
2016-17	50, 82,923/=

Detail of Production of Sand or Bajari or Minor Mineral in last three years

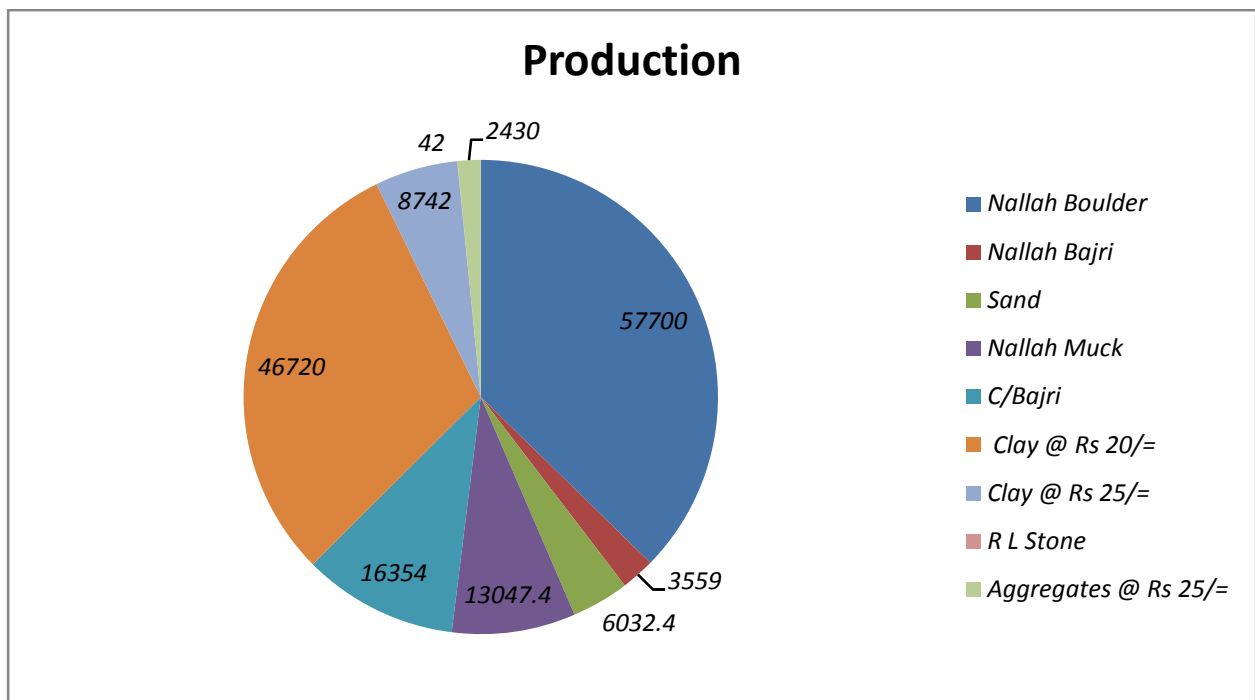
Financial Year 2014-15



Financial Year 2015-16



Financial Year 2016-17

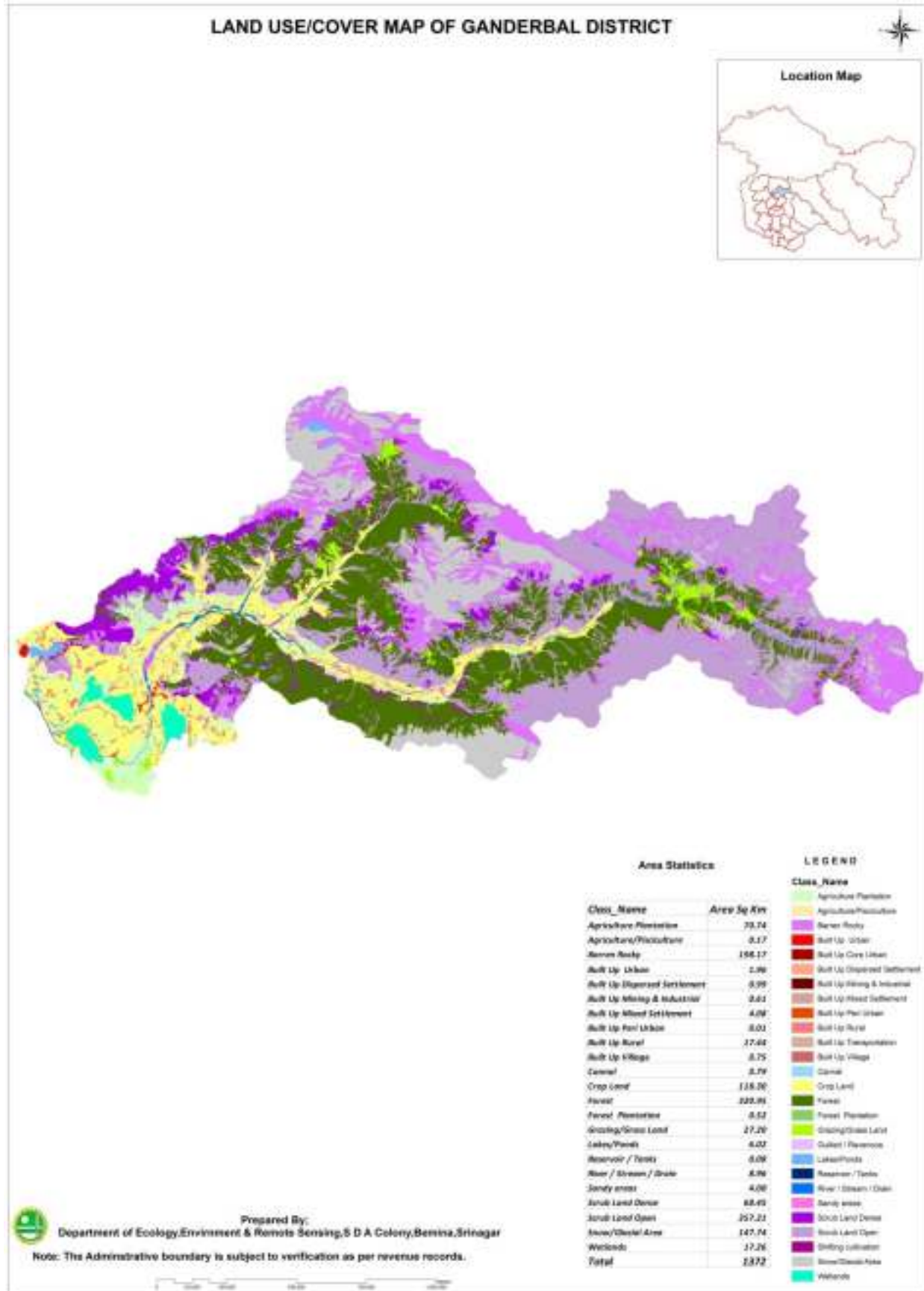


Mineral Potential of District Ganderbal

Portion of the River or Stream recommended for Mineral Concession	Length of the area recommended for Mineral Concession (in meter)	Average width of the area recommended for Mineral Concession (in meter)	Area recommended for Mineral Concession (in Square Meter)	Mineable Mineral potential (in metric tonne) 60% of total mineral potential
From Ganderbal D C Office upstream Sindh Nallah To Soraf Raw	16790	84	1410360	4671112
From Gozhama Hydroulic Point upstream Jhelum River to Kharbagh	1200	35	42000	139104

River-wise Mineral Potential of Ganderbal District

River Sindh Boulder /Bajri	River Jhelum Sand	Total mineable mineral potential (in metric tonne)
7785187	231840	8017027



Physical Survey

On August 08, 2017 physical survey was conducted in district Ganderbal, regarding Minor Mineral Blocks (Sand/Bajri and Nallah Muck) at Sindh Valley. The committee was headed by Addl. Deputy Commissioner, Ganderbal and the members of District Level Environment Impact Assessment Authority (DEIAA) who have been nominated for grant of environmental clearances for category B2 projects (B2 category projects pertaining to mining of minor minerals of lease area less than or equal to 5 hectares) for mining of minor minerals, for all the districts in the country. The author lead the committee to the Minor Mineral spots and 13 blocks were identified on ground.



Addl. Deputy Commissioner Ganderbal and DGM Team at Sind Valley Upstream Hayan Bridge



On spot inspection by Addl. Deputy Commissioner, Ganderbal, and DEIAA members at Sind valley

List of the Minor Mineral Blocks of Ganderbal District

BLOCK NO	NAME OF THE BLOCK	MINERAL	NALLAH	AREA (Ha)
1.	PLAN SHOWING MINOR MINERAL BLOCK, DUDERHAMA BRIDGE TO WAHIDPORA MALAPORA	NALLAH MUCK/ BOULDERS /BAJRI/SAND	SINDH	10
2.	PLAN SHOWING MINOR MINERAL BLOCK, MALAPORA TO BARDALA UPSTREAM	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	10
3.	PLAN SHOWING MINOR MINERAL BLOCK, ARCH TO BARDALA	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	9.93
4.	PLAN SHOWING MINOR MINERAL BLOCK, UNDERCONSTRUCTION BRIDGE TO ARCH	NALLAH MUCK/ BOULDERS/ BAJRI	SINDH	10
5.	PLAN SHOWING MINOR MINERAL BLOCK, UNDERCONSTRUCTION BRIDGE CHAPPER GUND TO WAYUL	NALLAH MUCK/ BOULDERS/ BAJRI	SINDH	10
6.	PLAN SHOWING MINOR MINERAL BLOCK - (A), AT WAYUL	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	10
7.	PLAN SHOWING MINOR MINERAL BLOCK, WAYUL BRIDGE TO WAYUL	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	9.81
8.	PLAN SHOWING MINOR MINERAL BLOCK, WUSSAN BRIDGE TO CHINNAR UPSTREAM BRAHAMSAR NAR	NALLAH MUCK/ BOULDERS/ BAJRI	SINDH	5
9.	PLAN SHOWING MINOR MINERAL BLOCK, WUSSAN BRIDGE TO PALANG	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	9.70
10.	PLAN SHOWING MINOR MINERAL BLOCK, KIJ PARAH TO BARWALAH	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	5.40
11.	PLAN SHOWING MINOR MINERAL BLOCK, HAYAN BRIDGE TO KANGAN	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	9
12.	PLAN SHOWING MINOR MINERAL BLOCK, MAMAR BRIDGE TO DARADUDER	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	9.30
13.	PLAN SHOWING MINOR MINERAL BLOCK, AKHAL-HAYAN BRIDGE TO SURFRAW	NALLAH MUCK/ BOULDERS/BAJRI	SINDH	10
14.	PLAN SHOWING MINOR MINERAL BLOCK U/S JHELMUM RIVER GOZHAMA HYDROULIC POINT TO KHARBAGH	SAND	JEHLUM	6.29

74°40'0"E

74°50'0"E

75°0'0"E

75°10'0"E

75°20'0"E

Geological Map of Ganderbal District



34°30'0"N

34°30'0"N

34°20'0"N

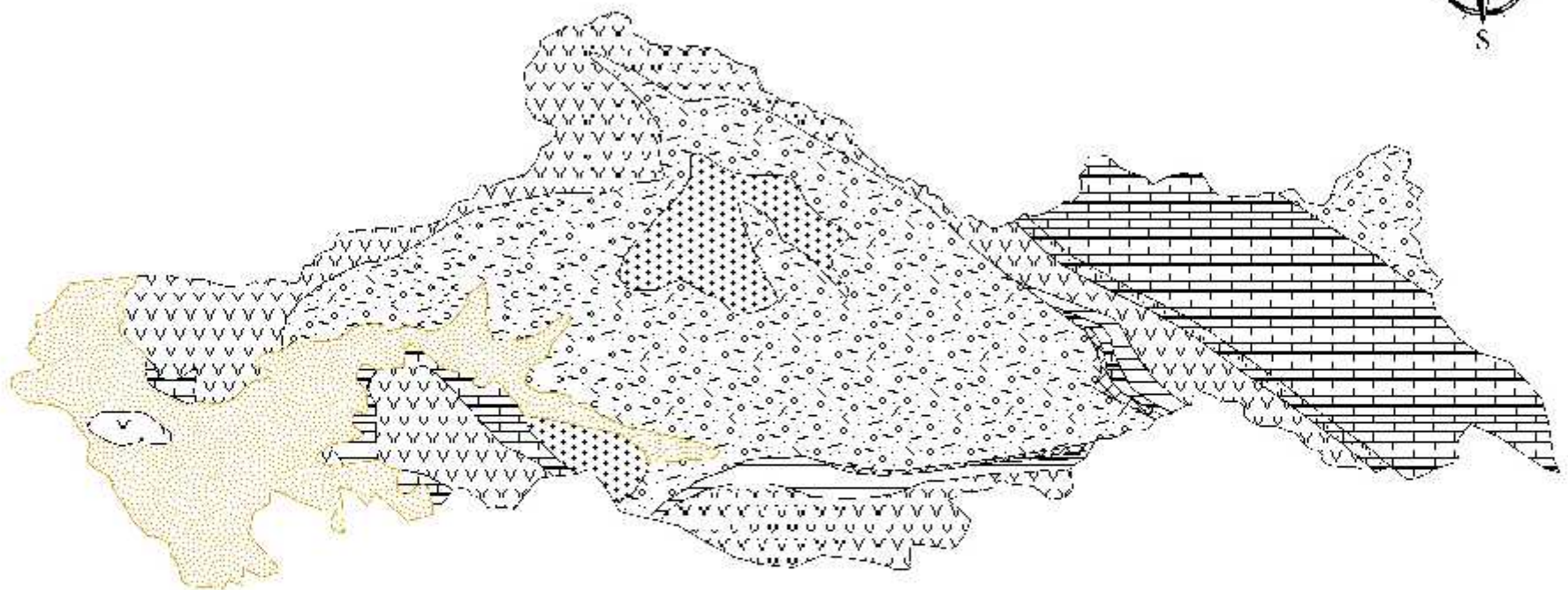
34°20'0"N

34°10'0"N

34°10'0"N

34°0'0"N

34°0'0"N



Legend

- | | | | |
|--|-------------------|--|---------------------------------|
| | Alluvium | | Panjal Traps |
| | Aglomeratic Slate | | Syringothris Limestone |
| | Granite | | Shalkhalas |
| | Muth quartzite | | Triassic - Jurassic limestone.. |
| | Permian | | |

0 0.05 0.1 0.2 Kilometers



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74°40'0"E

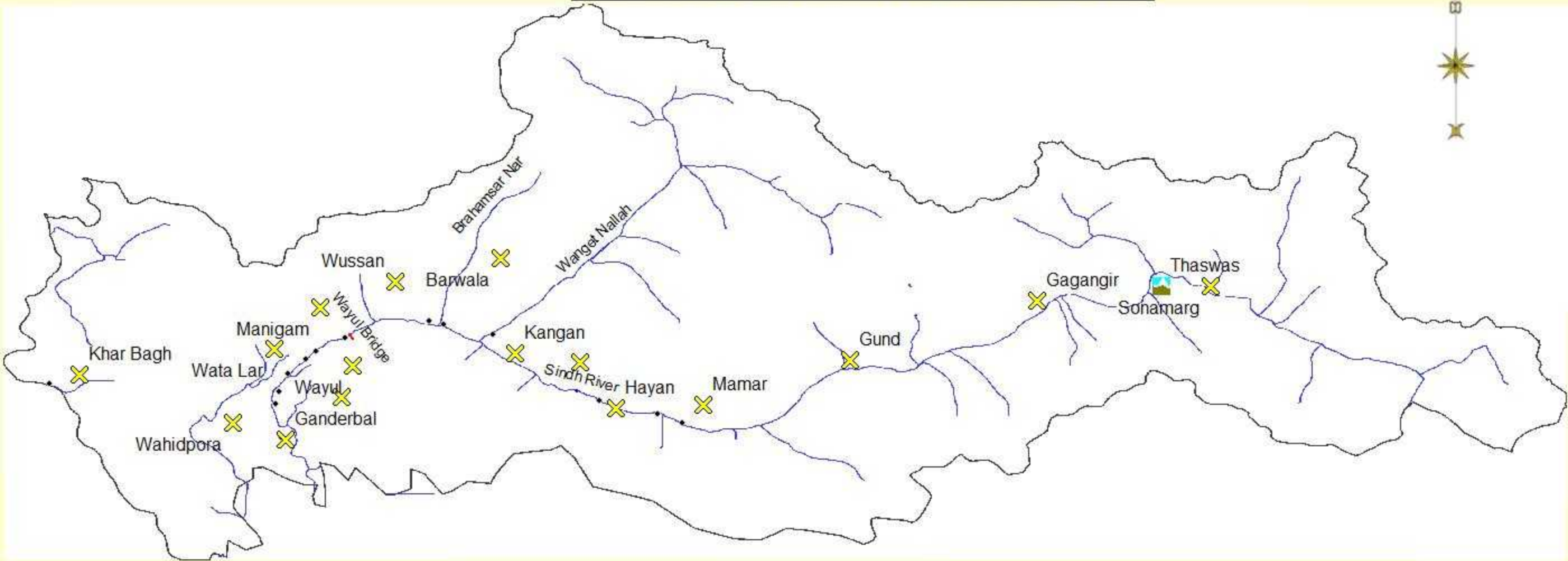
74°50'0"E

75°0'0"E

75°10'0"E

75°20'0"E

Location Map of Minor Mineral Blocks Ganderbal District



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- Brahamsar Nar.
- Bridge
- Sindh River.
- Wanget Nallah.
- Minor Mineral Block
- Thaswas Mountain
- X Village

Mohsin Noor Geologist Grade-III

