MINING PLAN

SON KHAD

MINOR MINERAL CONTRACT

FOR STONE , SAND & BAJRI

SITUATED IN KHASRA No.02/2, 1.5452 HECTARES,
MAUZA SARSHKAN,TEHSIL DHARAM{UR,
DISTRICT MANDI

LETTER OF INTENT GRANTED IN FAVOUR
OF
Shri SURESH KUMAR
VILLAGE BHAROURI & POST DHARMPUR
TAHSIL DHARAMPUR & DISTRICT MANDI,
HIMACHAL PRADESH

2020

Subhash Sharma

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Declaration
Certificate of RQP

Seal of Geological wing. Industries Deptt. Govt. of M.P.
APPROVED

खनिकोष शाखा,
उद्योग विभाग शिमला
Geological wing
Deptt. of Industries
Shimla
APPROVED
With Condition
शर्तों के साथ अनुमोदित
Vide Letter No. Indus-B2h(Khani-4)Leydu-614/2018-2428
Dated
दिनांक 14/7/2020

State Geologist,
Himachal Pradesh

MINING PLAN OF MINOR MINERAL CONTRACT FOR SAND, STONE & BAJRI SITUATED IN KHASRA No. 02/2, MEASURING 1.5452 HECTARES, MAUZA & MOHAL SARSHKAN, SUB-TAHSIL DHARAMPUR AND DISTRICT MANDI, LETTER OF INTENT GRANTED IN FAVOUR OF SHRI SURESH KUMAR, VILLAGE BHAROURI, P.O. & TEHSIL DHARAMPUR, DISTRICT MANDI, HIMACHAL PRADESH

INTRODUCTION

Shri Suresh Kumar, S/o Sh. Chaman Lal, resident of Village Bharouri, P.O and, Tehsil Dharampur, and District Mandi, Himachal Pradesh, have been issued a "Letter of Intent' for grant of mining contract for mining sand, stone and bajri for a period of fifteen years vide letter No. Udyog-Bhu(Khani-4) Laghu-614/2018-2425 dated 05-06-2018.

In accordance with condition 2 of 'Letter of Intent and Rule 35 of the 'Himachal Pradesh Minor Minerals (Concession) and Mineral (Prevention of Illegal Mining, Transportation, and Storage) Rules 2015' the lessee has to submit 'Mining Plan' for five years of the area applied or auctioned for mining contract. Therefore, bidder requested for the preparation of Mining Plan of the area after the issuance of 'Letter of Intent'. Accordingly, this 'Mining Plan' is prepared in accordance with the 'FORM 'M' annexed with the said Rules.

The auctioned block is a part of a Son Khad bed, Part VI in Mauza Sarshkan, Tehsil Dharampur of district Mandi. It lies at about 1.6 km from Dharampur and approx. 66 Km. from Mandi, the headquarter town of the district.

General

1.1 Name and address of the applicant

1.1. A. Name of the applicant --

Shri Suresh Kumar son of Shri Chaman Lal.

1.1. B. Address of the applicant –

Village : Bharouri,
Post office : Dharmpur,
Sub-Tahsil : Dharampur,
District : Mandi.

1.2 Status of the applicant

Shri Suresh Kumar is highest bidder in open auction of the mining quarry, held by State Government.

1.3 Minerals which the Applicant intends to mine

The applicants intend to mine Stone, Sand and Bajri. The stones, sand and bajri will be sold in open market to construction industry/infrastructure industry depending upon the market demand.

1.4 Period for which the mining contract is granted

Fifteen years.

1.5 Name and address of the RQP preparing the Mining Plan:

Subhash Sharma
207, Basant Vihar, Kasumpti,
Shimla 171009: Mobile 9816029594.
HP/RQP/01/1/2004

1.6. Name and address of the prospecting agency

The detailed prospecting of the area was carried out by the R Q P for preparation of this report. The secondary base data is collected from various sources such as Geological reports of the Geological Survey of India and various departments of Union and State Government.

2. *LOCATION AND APPROACH OF THE AREA.*

2.1 Topo-sheet No. H 43E13

Surveyed by Survey of India
Surveyed in 1989-90
Updated in 2005
Published in 2010
Scale 1:50000

Table 1: Showing latitude and longitude of bounding the area.

Latitude	Longitude
31° 48′ 17.5″ N	76° 46′ 03.7″ E
31° 48′ 25.5″ N	76° 45′ 59.8″ E

Figure 1 Location & Coordinates of Contract Area.

2.2 Location Details of the Area.

2.2a Revenue Details of the Area.

Table 2 : Details of Revenue Record

Khasra Number	Area Hectares	Status	Owner of Land	Kism	Mauza
02/2	1.5452	State Government	State Government	Gair Mumkin Darya	Sarshkan
Total - 1.5452 Hectares)					

2.3 Address Details

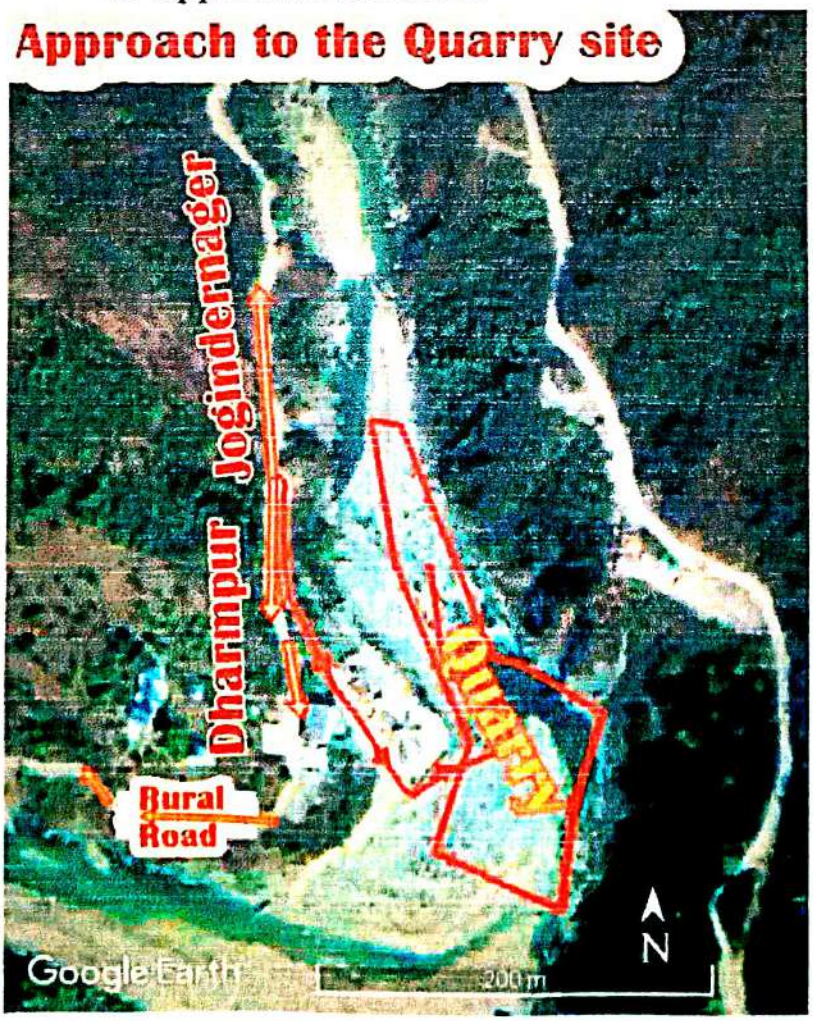
Village: -	Sarshkan
Patwar circle:	Dharampur
Post Office: -	Kalswai
Tahsil: -	**Dharampur**
District: -	Mandi
Sub-Divisional Office (Civil): -	Dharmpur
Divisional Office (Forest): -	Jogindernager
Range Office (Forest): -	Sarkaghat
Assistant Engineer (IPH): -	Dharampur
Assistant Engineer (PWD): -	Dharampur
State :	Himachal Pradesh

2.4 Distance from Important Places to Quarry site.

Distances from the Quarry site

S. No.	From	To	Distance (in K.mt.)
1	Quarry	Roadside Rural road	0.10
2		Dharmpur	1.6
3		Mandi (District Offices)	66
4	Roadside	Shimla (State Hq)	163
5		Bunter (Airport)	125
6		Jogindernager Metre gauge Rly Stn.	54
7		Sarkaghat	54
8		Sujanpur Tira	50

2.5 Approach to the Area.



The auctioned site is part of Son Khad a tributary of Beas river and can be approached from Dharampur by rural road and by a Katcha Track of about 100 metres leading to mine.

Figure 2: Approach to Quarry site

3. Physiographical Aspect of the Area

3. 1 General

The area in general is a part of the Lesser Himalaya. The Lesser Himalayas, located in northwestern India in the states of Himachal Pradesh and Uttar Pradesh, in north-central India in the state of Sikkim, and in northeastern India in the state of Arunachal Pradesh, range from 1,500 to 5,000 meters in height.

The general relief of the Mandi District is as given below in the figure: -3: -

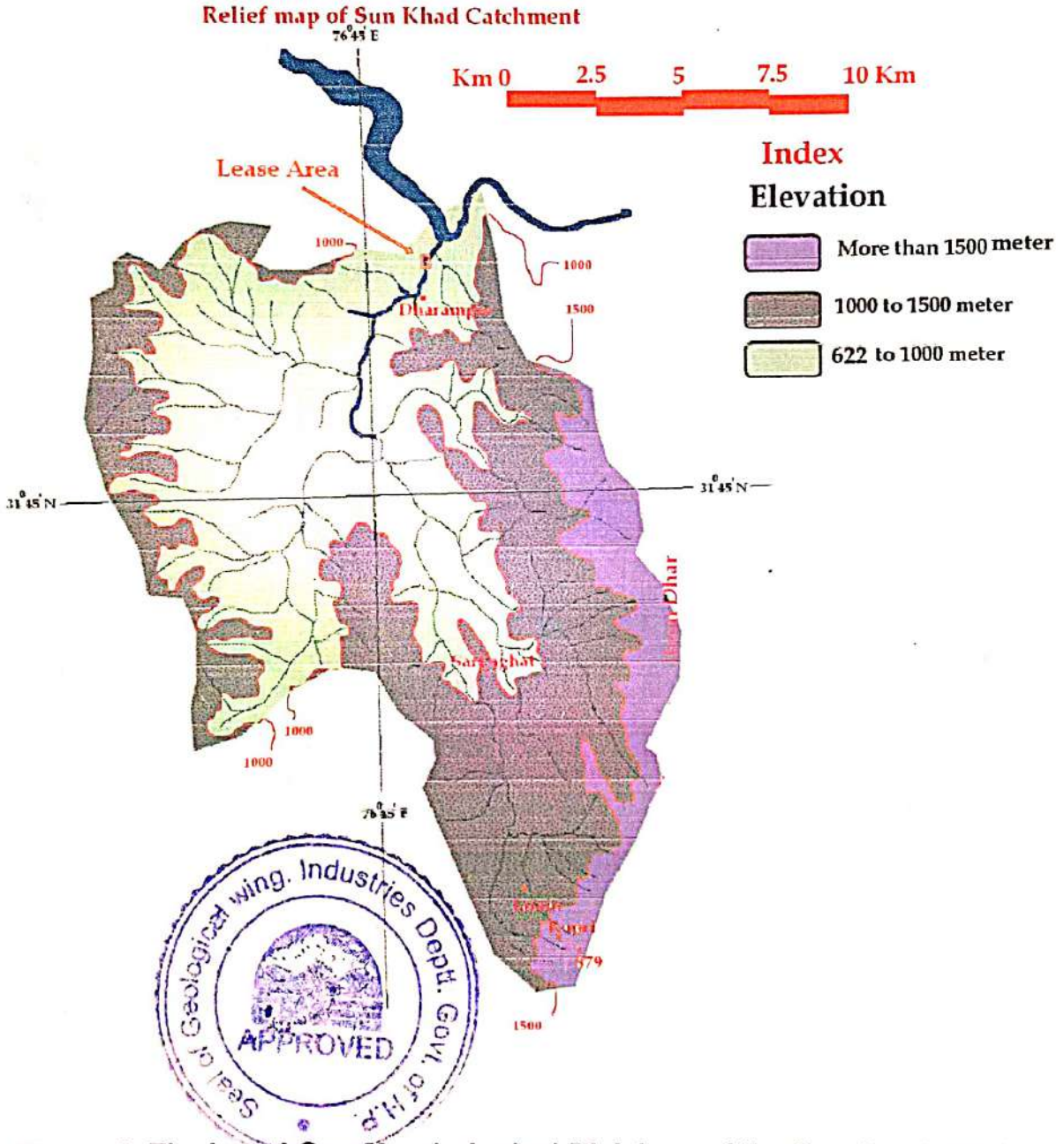


Figure 3: The broad Geo-Morphological Divisions of the Son Catchment.

The Satellite photograph was taken from the Google is given below (Figure: -4) to depict the general physiography of the area showing that the major ridges/water divides are generally running N-S and all spurs are running parallel to the NE-SW line.

3.2 Altitude of the area

- The highest contour of auctioned out area in Beas River is 628 Meters above MSL,
- The lowest contour of the auctioned-out area in Beas River is 623 Meters above MSL,

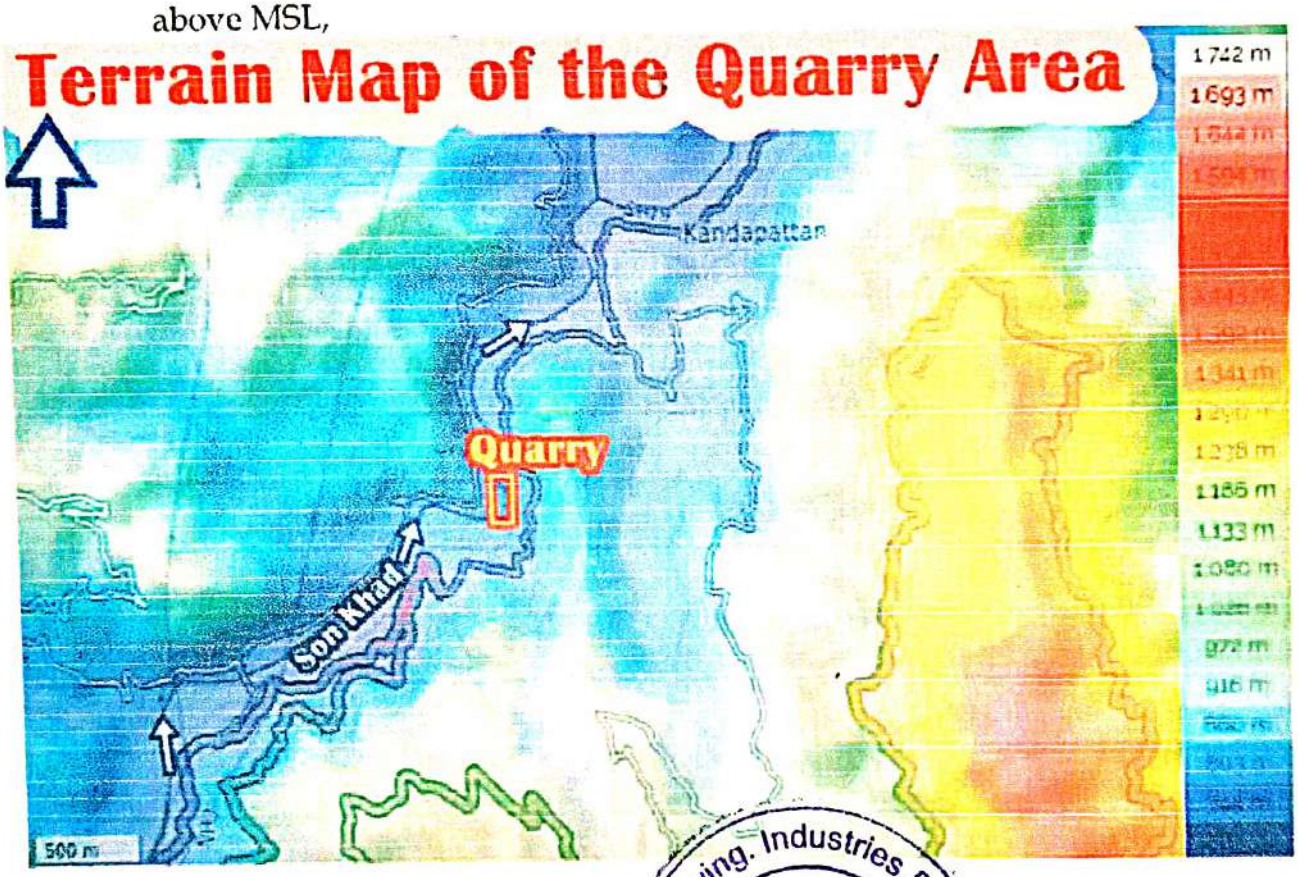


Figure 4: Terrain Map of the Area.

3.3 Climate of Area

The climate of district is hot in summer as it is situated in valley at lower altitude while surrounding mountains top experience pleasant weather and cold in winters. Monsoon brings plenty of rain from July to September. October to November is pleasant weather, during this time Lake is completely full. Hottest months are May and June when temperature usually hover around 37-38 degree Celsius and sometimes for few days jumping to above 40 degrees Celsius, the nights are comparatively cooler, and month wise temperature is given in figure 7.

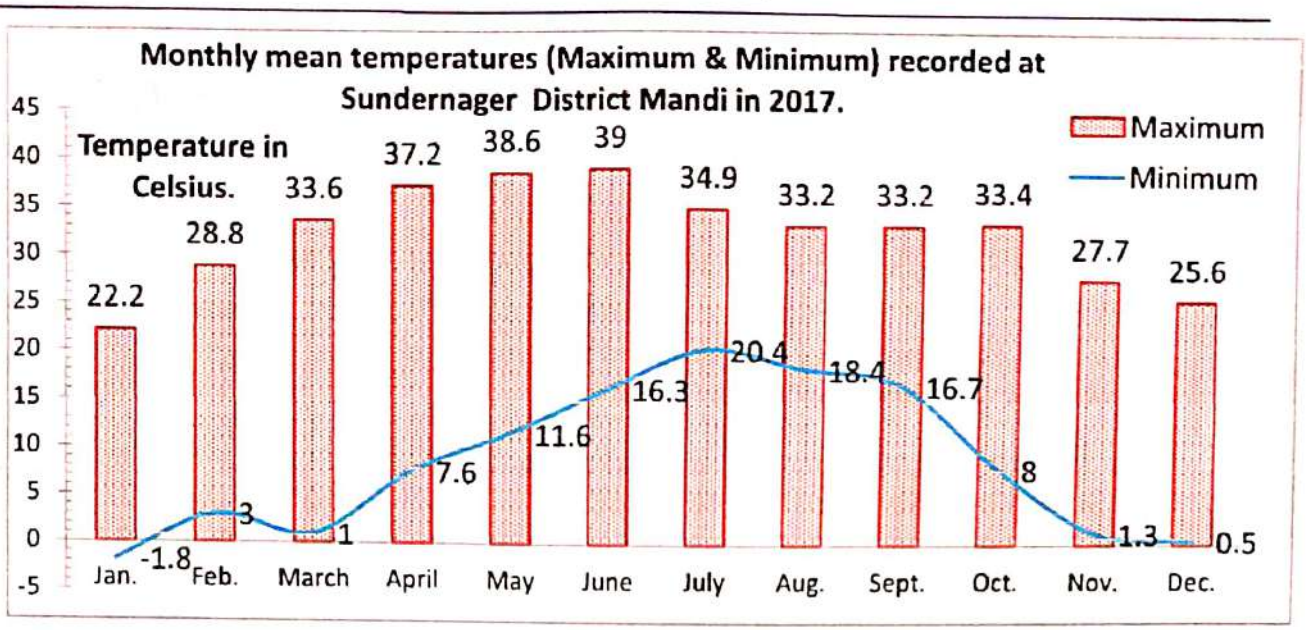
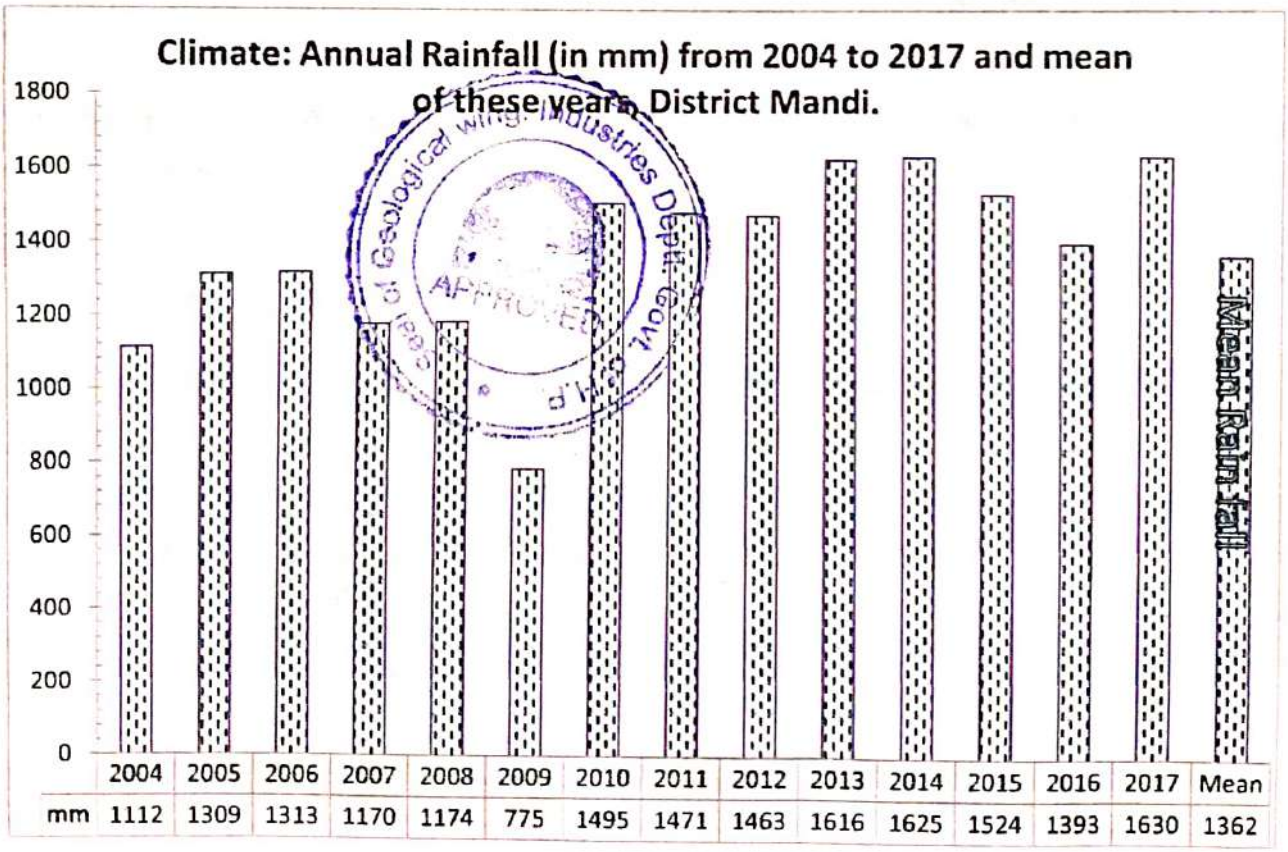


Figure 5: Mean monthly maximum and minimum temperature recorded at IMD station at Sundernager.

3.4 Rainfall



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean
mm	1112	1309	1313	1170	1174	775	1495	1471	1463	1616	1625	1524	1393	1630	1362

Figure 6: Rainfall of the District.

3.5 Any other important feature

The mining contract area falls in riverbed of Son Khad tributary of Beas River and accessibility to the quarry site is through a kutcha road.

PART I

1. DESCRIPTION OF RIVER/STREAM BED IN WHICH THE CONTRACT IS SITUATED

4.1 General

The contract area is situated in the Son Khad, a primary tributary of Beas River. Son Khad originates at a height of 1879 meter above mean sea level, from Sinkandr Dhar (origin lies in the Survey of India, topo-sheet NoH43E14. The general flow is S to N.

The attitude at confluence with Beas River is 622 Metres above MSL (lies in the Survey of India, toposheet No H43E113). The total length is about 27 Km. (The total catchment of the Son Khad lies on survey of India Topo-sheet Nos H43E9, H43E10, H43E13 & H43E14.

The general analysis of the drainage system of Son Khad is given below in table 5 (as per 1:125000 scale)

Table 3 **Showing drainage analysis of the Son Khad Catchment**

Sr .No	Drainage	No of Stream	Total Length Km	Average Length Km	Bifurcation ratio
1	Ist Order	65	156	2.4	0.92
2	2nd order	16	33.6	2.1	0.94
3	3rd order	5	31.6	6.3	0.83
4	4th order	1	9.4	9.4	0.50
	Total stream	87	230		

There is no uniformity/ equational order of average length in each order suggesting that river has not attained proper age and valley is in process of expansion i.e erosion in upper reach will be unavoidable. Bifurcation ratio also suggest that it has not attained maturity particularly 1st, and 2nd order hence regular erosion in the upper reaches. The low bifurcation ratio of the 3rd order stream is indicative that the valley is in the stage of further expansion. The average length of 2nd order is less than 1st order is indicative of structural control of the valley.

Basic Geometry of the catchment is as: -

Area of the Catchment = 187.4 Sq. Km
Perimeter of the Catchment = 54 Km
Length of the river 27 Km
Length of Valley 22 Km
Width of the catchment at maximum 15.2 km
From various analysis of the drainage the Son Khad can be divided into two parts

- From origin to the 800 meter above mean sea level
  The zone of active erosion—Young stage

- From 800-meter contour to confluence with Beas River
  The zone of erosion during very high flood otherwise deposition – Maturity stage.

The contract area is situated in the zone of Maturity

The catchment of the Son Khad is given below in the figure 7

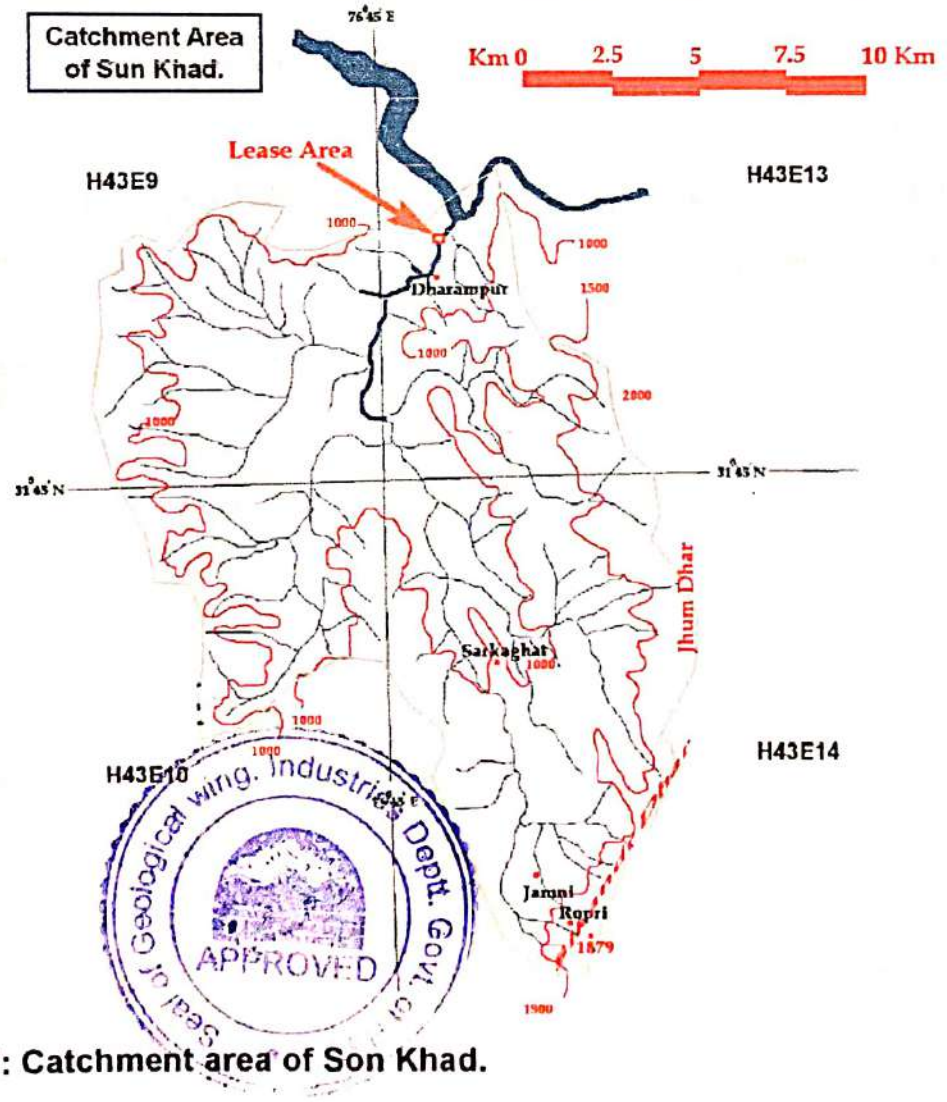


Figure 7: Catchment area of Son Khad.

1.2 Name of River/ Stream in which the contract is situated

Son Khad – Primary tributary of Beas River.

1.3 Drainage System

Beas River

1.4 Type of Drainage

Dendritic (Figure 7)

1.5 Origin of River/Stream

Son Khad originate at a height of 1879 meter above mean sea level, from Sinkandr Dhar (origin lies in the Survey of India, toposheet No H43E14). The general flow is S to N.

The attitude at confluence with Beas River is 622 Metres above MSL (lies in the Survey of India, toposheet No 53 A/13).

1.6 Attitude at Origin

1879 metres above MSL

1.7 Width of River at the place of Mining

80 to 120 Metres

1.8 The annual deposition at the place of mining

5 to 8 Cm, at different location, in the quarry area as evident from the photo 1

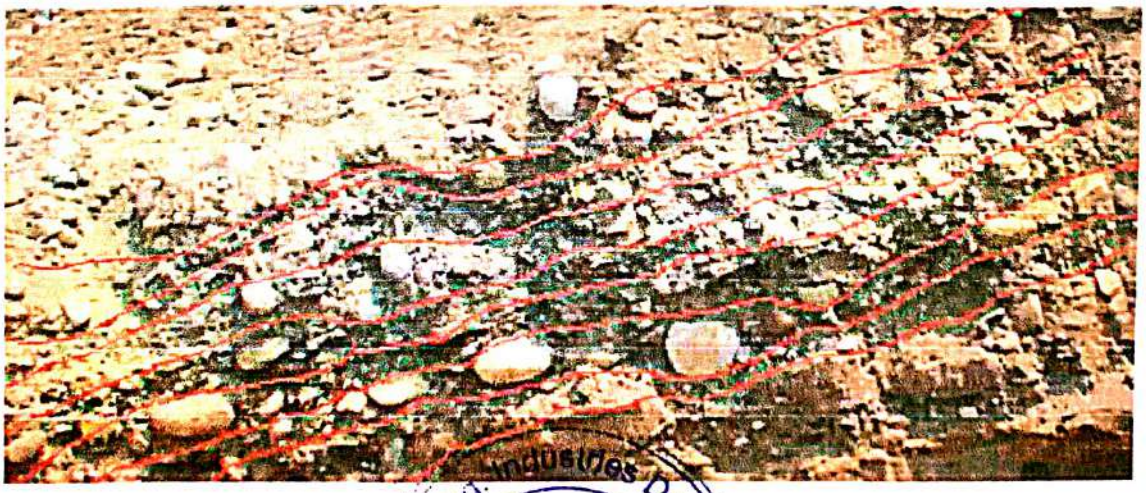


Photo 1 **Showing annual deposition of 5 to 8 Cm near quarry area and also showing one year depositional part.**

1.9 The Competency of the River/ Stream at the mining site

The general competency at the mining area is 4 to 7 Kg approx. The largest boulder varies 24 to 37 cm X 19 to 34 cm X 19 to 32 cm (length X breath X height) (Photo 4,)

Photo 2 :Showing the competency of river in contract area

1.10 The level of HFL

During monsoon floods the water level rises by about 1.5 metres, at times for short spells.

1.11 The level of LFL

About 0.30 centimeters.

1.12 The thread of deepest water in meandering.

The landform being depositional the meandering thread is constantly changing during the rains depending upon the water level.

2. Geology

2.1 Regional Geology

GEOLOGICALLY Himachal Pradesh can be broadly divided into two major geo-tectonic zones viz. the Lesser Himalayan tectogen in the south and the Tethys Himalayan Tectogen in the north. These two tectonic zones are juxtaposed with each other along a major tectonic break collectively designated as Main Central Thrust in the sense defined by Srikantia (1988). Mandi District lying within the Lesser Himalaya and the Shiwalik Foothill comprises rocks ranging in age from Proterozoic to Quaternary. The oldest rocks are of undifferentiated Proterozoic age, comprising canrbonaceous phyllite, schist, gneiss, quartzite and marble. The Ghoghar Dhar (Undifferentiated Proterozoic age) occurs as an intrusive body within the Chail Group of rock. This granite body is well foliated and composed of gneisses, granite with minor aplite and basic veinlets. The Sondernagar Group of Rocks of Meso- Proterozoic age is represented by quartzite with basic flows. The Shali Group of Rocks (Meso- Proterozoic) Comprising limestone, dolomite, (at places stromatolytic) slate, & quartzite. The Subathu consists mainly, of olive green shales and grey shales. At the top, a band of white quartzite is exposed; this band of white quartzite has been taken as the marker, defining the top of the Subathu sequence. The thick sequence of brackish and fresh water sediments immediately succeeding the fossiliferous marine Subathu are classified as Dharamshala Formation. The Dharamshala Formation are widely exposed in the Mandi parautochthon, further west in the autochthon, these rocks are exposed, in the core of the Sarkaghat anticline. The Shiwalik Group of Middle Miocene of Early Pleistocene age comprises coarse clastic fluviatile deposits of sandstone, clay and conglomerates. The Quaternary sediments (Older Alluvium and Newer Alluvium) along prominent channels consisting of sand, silt, clay, pebbles and cobbles occurring along present channels of Middle to Late Pleistone and Holocene age.

5.2 Local Geology

The local geological sequence in the area is given in the figure WP-7 and stratigraphy of the area is given in the table WP-5

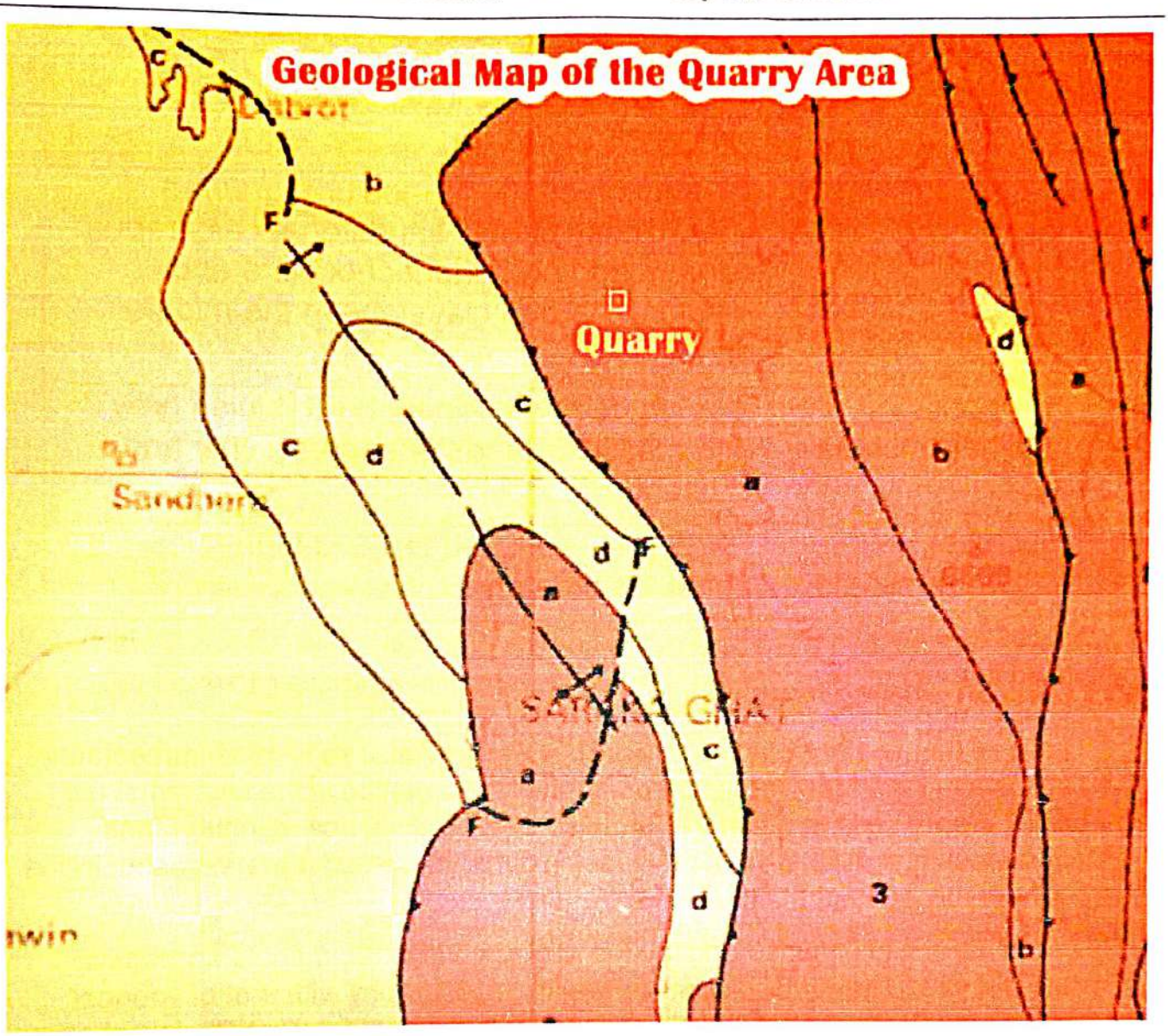


Figure 8:Geological Map of the Area

Table : Stratigraphy of the Son Khad/Son Khad Area

Sr. No	Formation	Rocks
1	Newer Alluvium Channel Alluvium	Grey micaceous, fine to coarse grained sand, silt, clay, boulders, cobbles and pebbles of sandstone and quartzite
2	Upper Siwalik	Predominantly massive conglomerate with red and orange clay as matrix and minor sandstone and earthy buff and brown claystone

3	Middle Siwalik	Massive Sandstone with minor conglomerate and local variegated claystone
4	Lower Siwalik	Alternation of fine to medium- grained sporadically pebbly sandstone, calcareous cement and prominent chocolate and medium maroon claystone in the middle part
5	Upper Dharamshala	Medium to fine grained, hard, bluish grey and massive Sandstone, green clay and siltstone
6	Lower Dharamshala	Hard, grey, well bedded and high mica content sandstone

2.2.1 Dharamshala Group

The thick sequence of brackish and freshwater sediments immediately succeeding the fossiliferous marine Subathu Formation is the Dharamshala Formation. The Dharamshala Formation are widely exposed in the Mandi parautochthon, further west in the autochthon, these rocks are exposed, in the core of the Sarkaghat anticline.

This highly folded and faulted sequence of Dharamshala aggregating to about 4000 meter displays a contrasting topography with that of younger and softer Siwalik rocks. The thick, hard and highly competent Dharamshala rocks stand out as prominent ridges with higher relief.

Dharamshala Group is divided into two Formations:

Upper Dharamshala

Lower Dharamshala

2.2.1. a: Upper Dharamshala Formation

Upper Dharamshala consists of thick sequence of sandstones, siltstones and clays. The Sandstones are medium to fine grained, hard, bluish grey and massive while the clays and siltstone are usually green.

2.2.1. B: Lower Dharamshala Formation

Lower Dharamshala formation consists of very bright and red and mauve coloured clay and shales with thin bands of sandstone which are steel grey in colour, highly micaceous and well bedded.

2. 2.2 Siwalik Group

The Siwalik deposits are one of the most comprehensively studied fluvial sequences in the world. They comprise mudstones, sandstones, and coarsely bedded conglomerates laid down when the region was a vast basin during Middle Miocene, to Upper Pleistocene times. The sediments were deposited by rivers flowing southwards from the Greater Himalayas, resulting in extensive multi-ordered drainage systems. Following this deposition, the sediments were uplifted through intense tectonic regimes (commencing in Upper Miocene times), subsequently resulting in a unique topographical entity - the Siwalik Hills. The Siwaliks are divided stratigraphically into three major Subgroups - Lower, Middle, and Upper. These Subgroups are further divided into individual Formations that are all laterally and vertically exposed today in varying linear and random patterns.

Ongoing erosion and tectonic activity has greatly affected the topography of the Siwaliks. Their present-day morphology is comprised of hogback ridges, consequent, subsequent, obsequent, and resquent valleys of various orders, gullies, choes (seasonal streams), and earth-pillars, filled earth buttresses of conglomerate formations, semi-circular choe-divides, talus cones, colluvial cones, water-gaps, and choe terraces. Associated badlands features include the lack of vegetation, steep slopes, high drainage density, and rapid erosion rates.

In the advent of Neogene, a depression was formed in front of the rising mountains (Proto- Himalaya). This depression becomes a repository of a thick sequence of molassic sediments of the Siwalik. The Siwalik Group comprising conglomerates friable micaceous sandstone, siltstone and claystone.

The conglomerates in general are poorly cemented but at places they are very hard. These consist mainly of pebbles and cobbles of quartzite. The stray pebbles of granite, limestone, sandstone, breccias and lumps of claystone are also observed at places. Often the size of pebbles is large enough to be called as Boulders. The conglomerates not only occur as regular band but also as lenticular bands alternative with micaceous sandstone and clay-beds. The sediments were bought down 2 to 25 million years ago by the numerous fast flowing rivers issuing forth from rapidly Rising Mountain mass of the Himalaya, in the north.

The Siwalik Group is divisible into three sub-groups respectively the Lower, Middle and Upper on the basis of the litho-stratigraphy as given in the table (Table -4)

2. 2.2.a: Lower Siwalik: - The lower Siwalik consists essentially of a sandstone-clay alternation. In district Kangra the lower sequence of the lower Siwalik consists of medium grained sub-graywacke interbedded with thick red clay, but higher up in sequence, sandstones are coarser and clasts become more frequent while the clays are less developed. The uppermost horizon consists of conglomerate with well-rounded clasts of grey quartzite possible derived from the Shali. The total thickness is 1600 metres.

2. 2.2.b: Middle Siwalik: - The Middle Siwalik Subgroup comprises of large thickness of coarse micaceous sandstone along with some inter-beds of earthy clay and conglomerate. It normally succeeds the Lower Siwalik along a gradational contact. The sandstone is less sorted than those in Lower Siwalik. Clay bends are dull coloured and silty. The general thickness is 1400 to 2000 metres

2. 2.2.c: Upper Siwalik:-The Upper Siwalik is mainly represented by sandstone inter-bedded with silt and conglomerate. The lower portion of the Upper Siwalik mainly consists of soft, massive, pebbly sandstone with intercalations of conglomerates. In the upper portion the conglomerate intercalation is replaced by the clays intercalations. The general thickness in the district is 2300 metres.

2.2.3 Newer Alluvium

Newer Alluvium is composed of cyclic sequence of grey, micaceous, fine to coarse grained sand, silt, boulders, cobble, pebble and clays. Newer alluvium exposed as point bar/channel bars within the active channels.

2.3 Geology of the contract area

The quarry out area forms a part of the stream bed covered with boulders, cobbles, pebbles, river born bajri, and sand and clay deposit of Channel alluvium. The rocks in the catchments of Son Khad is of Upper Siwalik Formation. The area is comprising predominantly the quartzite Boulders, Sand and river born bajri of Sandstone. The boulders are white, spotted white, greenish white, pink, purple and dark green in colour

2.4 Nature of the Boulder/ Cobble/ Sand

The area lies with in the regular course of the Son Khad gets flooded in the rainy season

All the deposit comprises quartzite, sand and fraction of granite, limestone and breccias- fragments. The boulders are white, spotted

white, greenish white, pink, purple and dark green in colour. Quartzite fragments are rounded, sub- rounded and discoidal in shape having smooth surface. Their size varies from gravel to boulder.

Thickness of the deposit varies from one to three meter.

During the monsoon this bed replenishes to a large extend from the Upper Siwalik Formation rocks due to erosion by heavy flow from higher reaches. Due to sudden decrease in the carrying capacity and competency of the river the annual deposition of one to three cm is received.

Photo 3; **Showing the nature of the Lease area in the Son Khad.**

2.5 The Nature of the rock along the bank

The rocks along the left bank belong to Terrace Deposition of the Quaternary Formation consisting of boulders, cobbles, pebbles, river born bajri, and sand and clay deposits. The rocks on the right bank belong to tertiary formations.

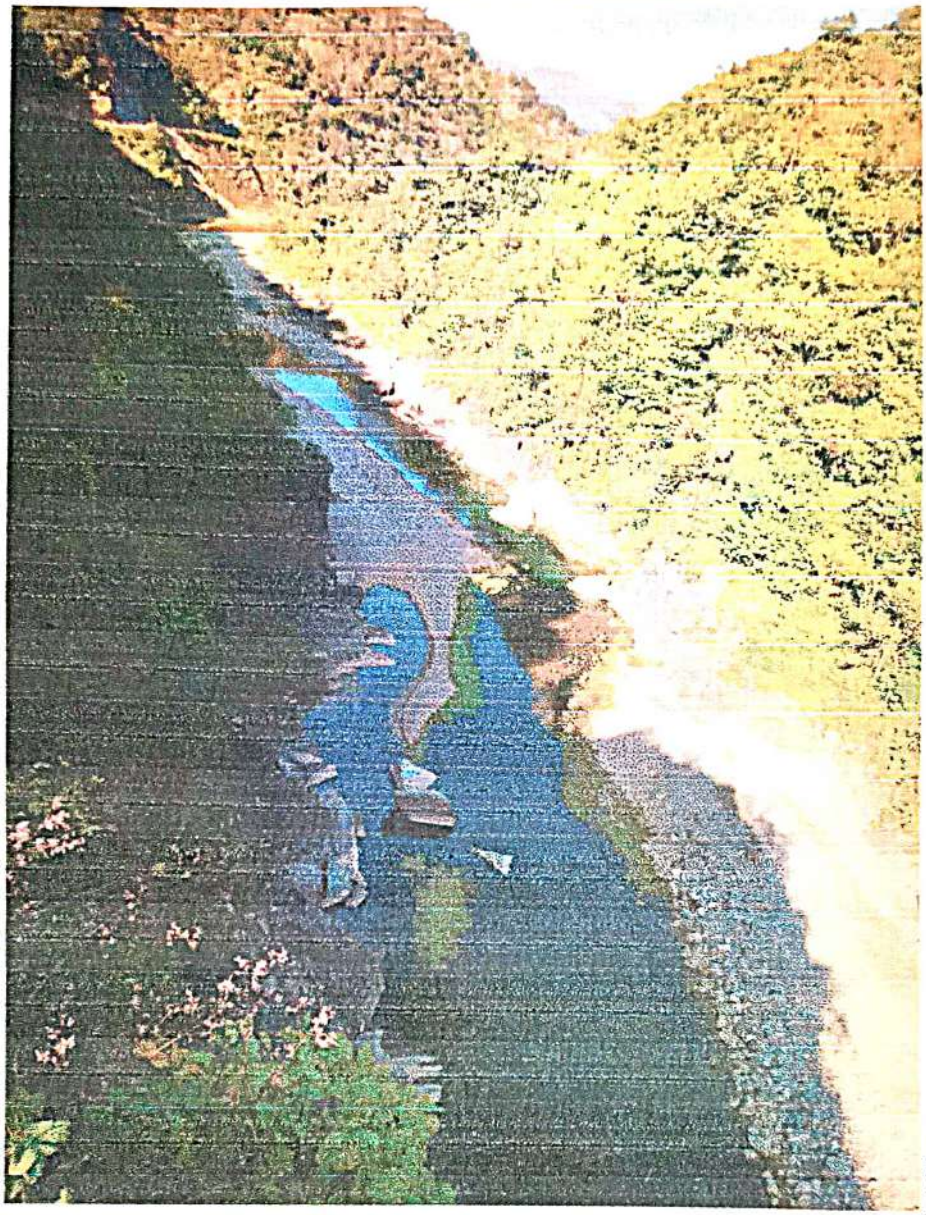


Photo 4 Rocks on the banks.

2.6 Estimate Annual Deposition of Mineral

The area being part of the River which receives annual rainfall, the mining pits will get replenished during the rainy (monsoons) season. As abundant precaution, keeping in view the variation in rainfall particularly highest rainfall, which generally causes floods, the factor of five cm annual replenishment is taken into consideration in general. The annual replenishment of the material also depends on the discharge, grade of river and geology of catchment area. However, it is generally observed that replenishment of more than five cm occurs in a year as all the old pits get filled with mineral during the very first flood of the monsoon. *Hence mined out area of the pre- monsoon will be filled with mineral during monsoon and even during winter rains.*

3. RESERVE ESTIMATE

3.1 General Consideration

The basic requirement of the Contractor will be stone, bajri and sand for open sale in the market.

3.2 Percentage wise distribution of Mineral:

The table below shows the percentage wise distribution of minerals and figure 9 depicts the pie chart for the same.

Table shows the percentage wise distribution of minor minerals:

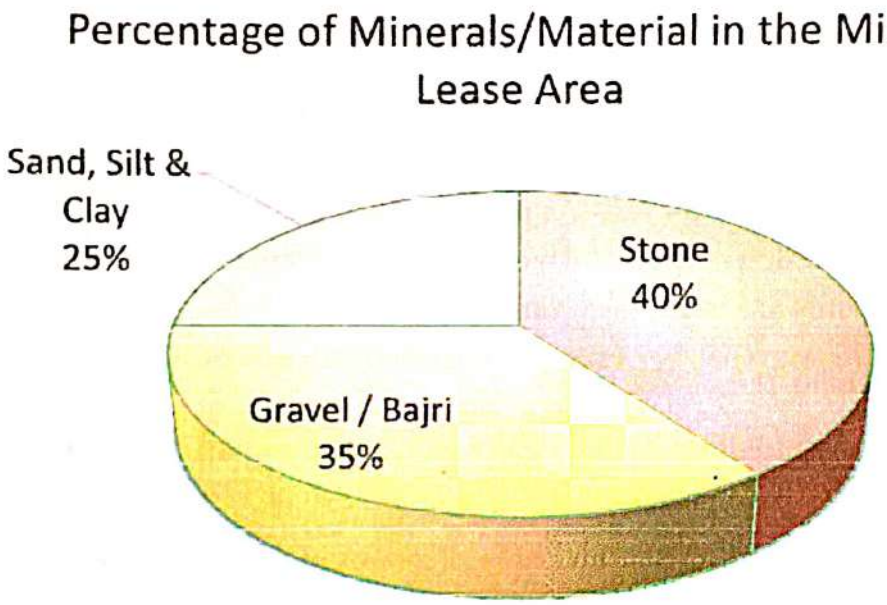


Figure 9 Percentage of each category of mineral present in the auctioned area.

1	Stone	40%
2	Gravel / Bajri	35%
3	Sand, silt & clay	25%

3.3 Estimate of Geological Reserve

The entire block falls within the River corridor. Thus, the mining Contract area of 15452 square metres can be considered for estimation of geological Deposit. The estimated thickness of deposit is more than 5 metres. However, considering its depth for purpose of estimation of Geological reserves to a depth five metres and specific gravity to be 2.25, the Geological deposits in the area are to a tune of about 173835, metric tons as shown in the chart.

Geological Reserves

Geological Reserves	Thickness, in metres	Contract Area (Square Metres)	Reserves Rounded off (In tonnes)
Proved	5	15452	173830
Specific Gravity 2.25			
Formula = Surface area X thickness/depth X specific gravity = Reserves			

3.4 Estimate of Mineable reserves of boulders, Bajri and Sand

The basic requirement of the Contractor is sand, stone and bajri. Hence, the applicants intend to mine sand, stone and bajri and it will be picked up by hand shoveling and loaded in tractor trolleys for transportation to the market/construction sites for sale. As per the policy guidelines issued by the State Government for Mining of River / River bed and to calculate the mineable reserve the following points are taken into consideration.

Adequate safe distance has been provided from the points of utilities as per Rules and guidelines.

As per the policy guidelines issued by the State Government for Mining of River / River bed,

- ✓ In this case only one-meter area is proposed as safety zone as the depth of mining is constrained to one metre.
- ✓ Mining is not permitted within 1/10th of riverbed or 5 meters from the banks (HFL) of the river / River whichever is higher. The width of the River in Contract area is 80 to 120 meters; thus, no mining is proposed in the area up to 8 to 12 meters from the banks.
- ✓ The water table level will go down as the water recedes after the monsoons.
- ✓ The depth of water table will be at lowest in the pre-monsoon season
- ✓ A geological map on 1:2000 scale is prepared and main litho units were marked on the plan to know the surface spread of each unit.
- ✓ The entire width of the river gets flooded during heavy rains in monsoons. The mined area gets replenished in the very early floods in the beginning of the monsoon season.

The total mineable area and deposit is shown in figure 12, table 7 and figures 13.

- *The whole area is mineable as it falls beyond the safety zone along the banks.*
- *After providing safety belt of one metre along the periphery of the auctioned area, places of public utilities and for banks only 142000 square metres of area is available for mining out of 15452 square metres as shown in table 7.*

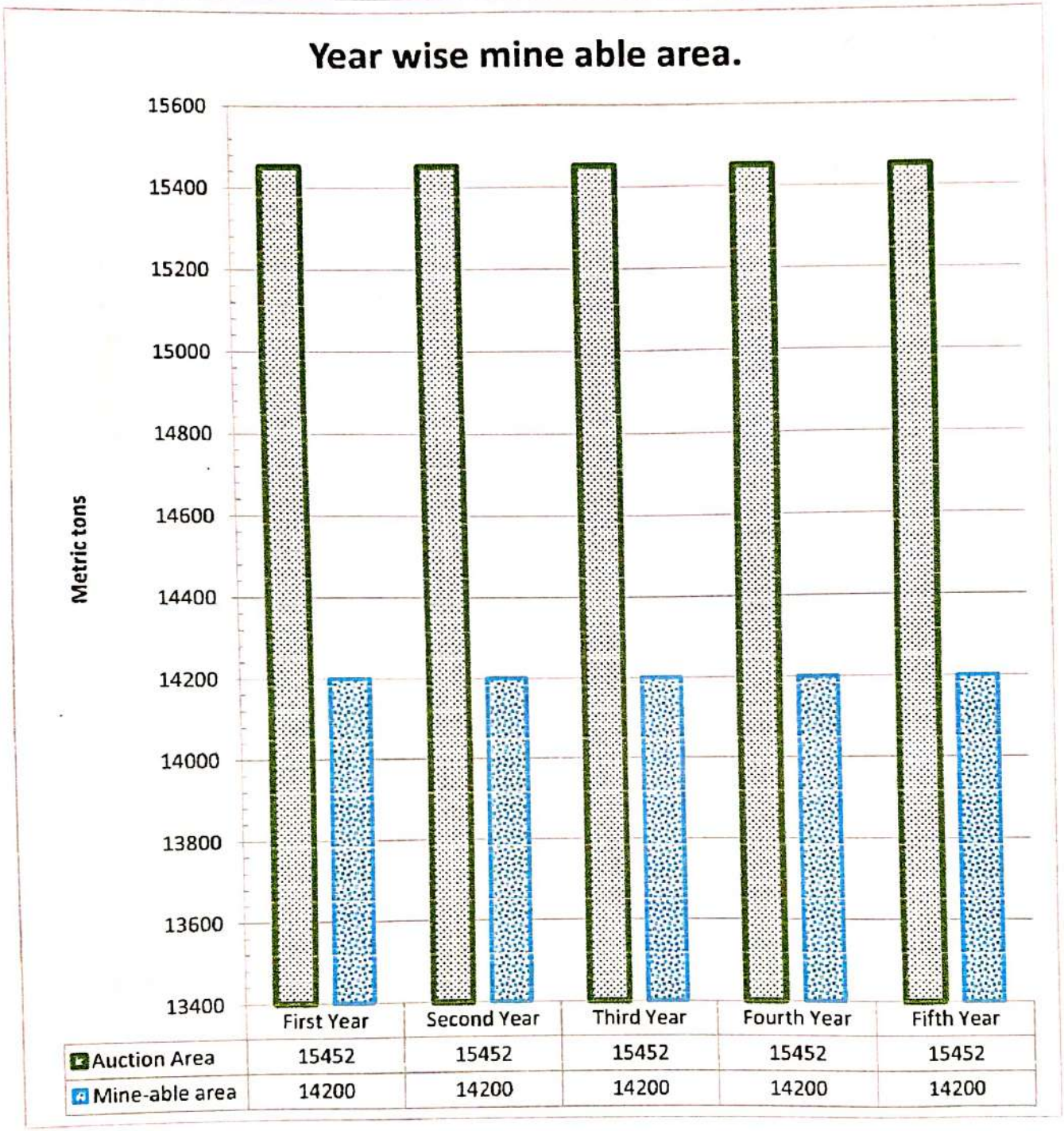


Figure 10: Mineable area.

Table 7 Mineable reserves in the block

Contract Area Sq. metres	Mineable Area Sq. Metres	Stone	Gravel Bajri	Sand, Silt & Clay	Total
15452	14200	1278[illegible]	11180	7990	31950

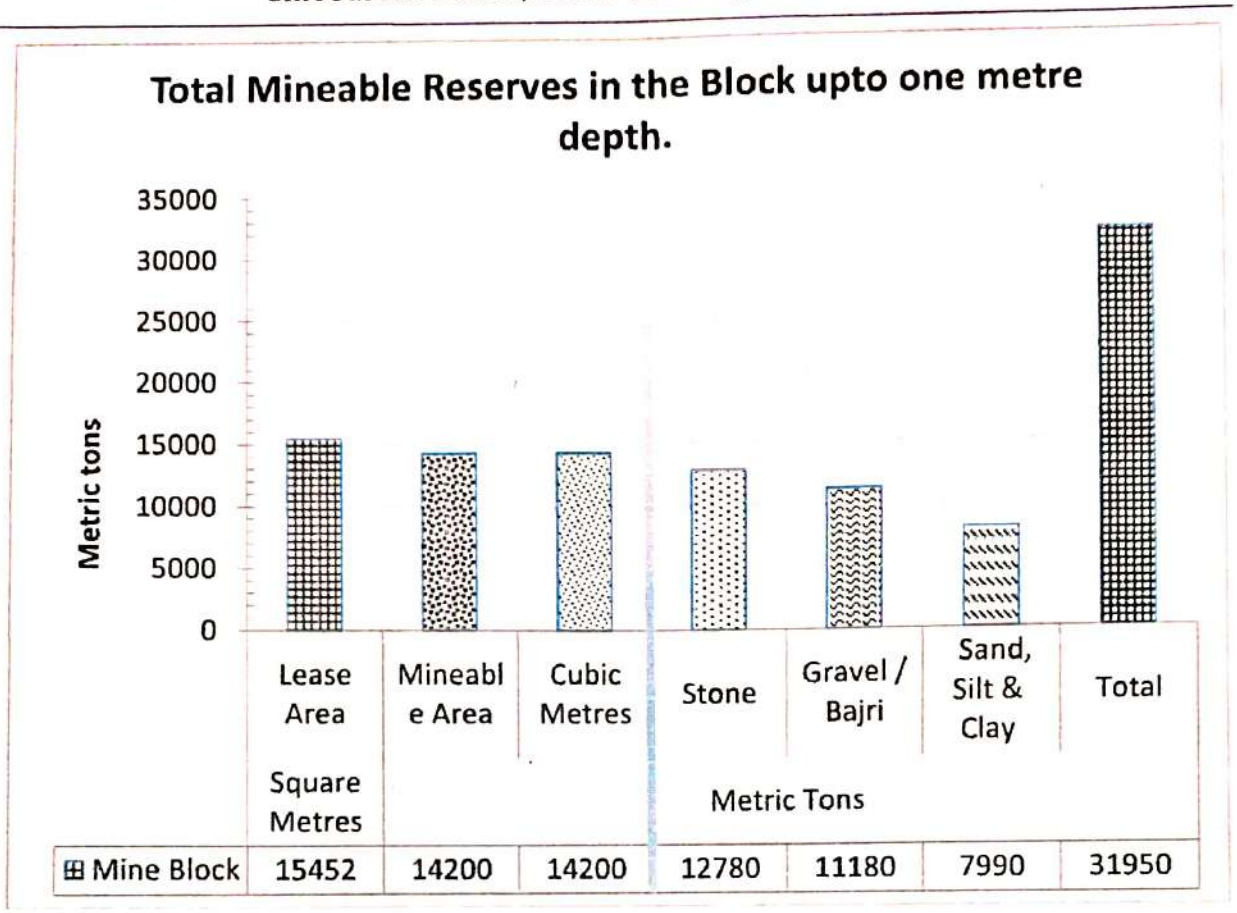


Figure 11: Mineable Reserve up to One Metre depth

Thus, the safe mine-able block of 14800 square metres contains 33300 tonnes of mine able material. The entire mine able block will be mined every year.

3.4a Depth of mining

- The Rule 34 (IV) of Rules stipulates *'the depth of mining in the river bed shall not exceed one metre or water level whichever is less'.*

One metre **maximum** depth from the surface is considered for mining of the reserve.

3.4b. Specific Gravity

The specific gravity of Quartzite is 2.65 and of sand is 1.85. Hence average specific gravity of **2.25** is taken for calculation of the deposit.

3.5. Estimate of Annual deposition

The reserves of all the constituents of auctioned block have been calculated for the safe mine-able area to be 14200 metric tonnes, considering the specific gravity as 2.25 as shown in para 3.6. The reserves have been calculated for year of mining, computing mine-able deposit up to maximum permissible quarry depth of one metre are depicted in figure13. ***Depending upon normal rainfall from year to year causing erosion in the catchments and flooding of River bed, the minerals are inexhaustible, but presently these deposits are part of Geological Formations of catchments.***

Figure 14 shows the proposed production of materials in five years.

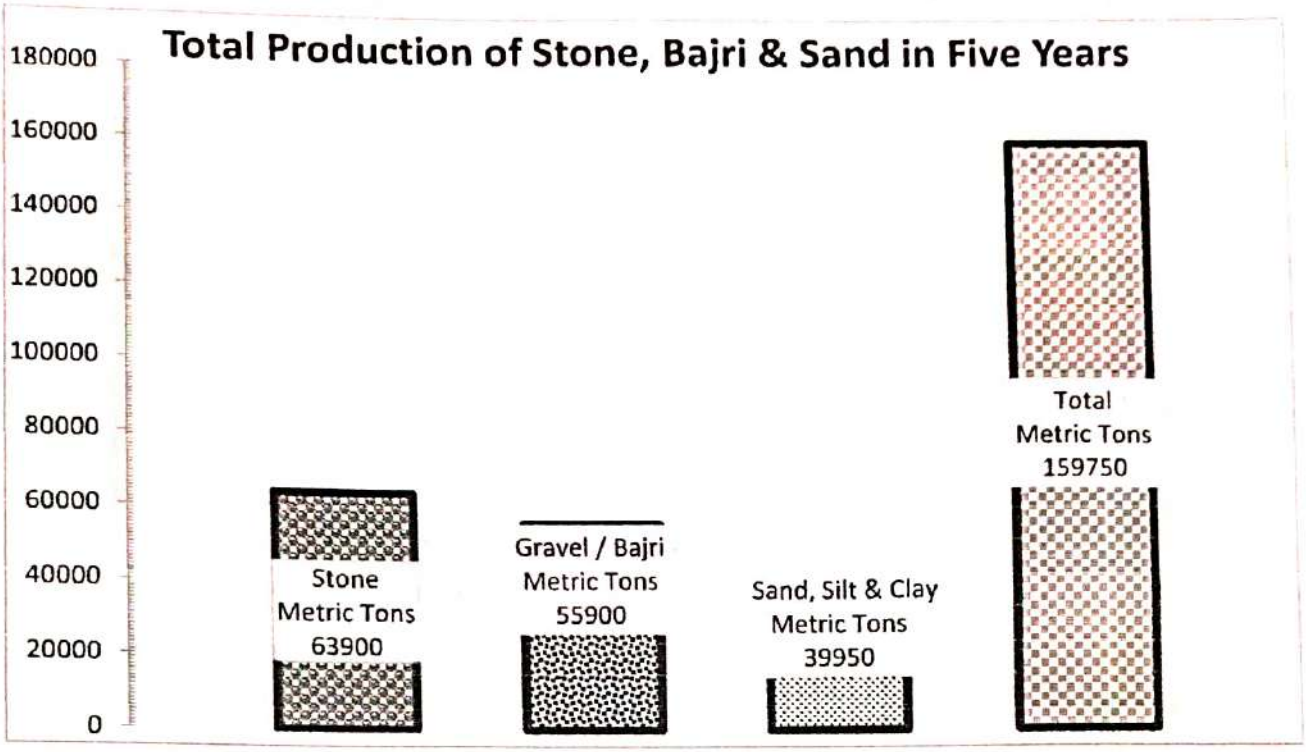


Figure 12:Proposed production of total material in five years

4 MINE DEVELOPMENT AND PLAN OF PROGRESSIVE MINING

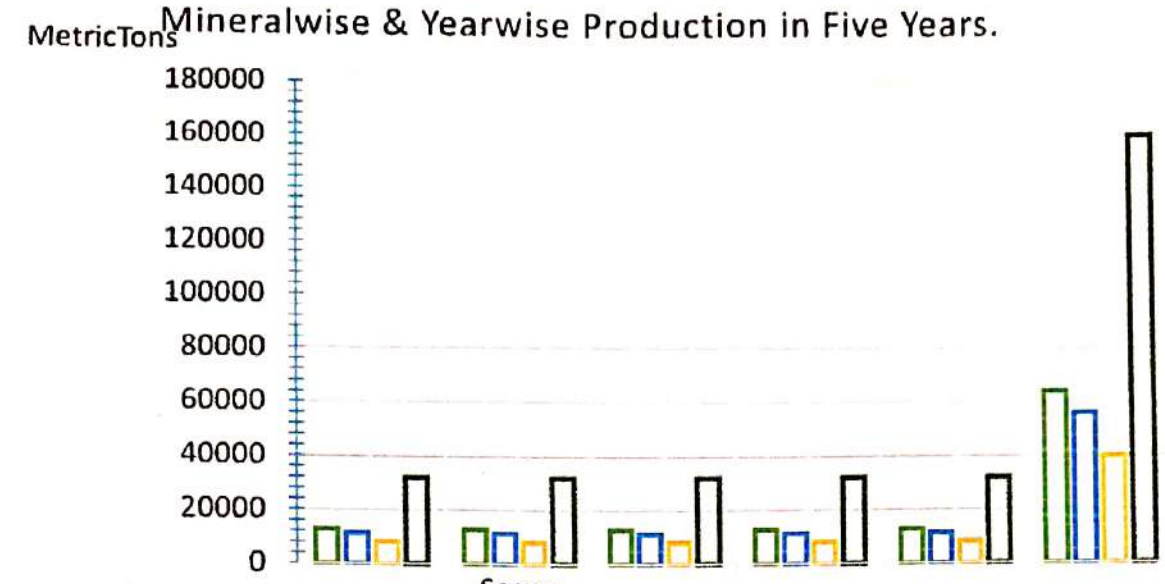
The mining / collection of minerals shall involve shoveling by simple hand-tool, manual sorting / picking and stacking in the form of dumps at site and loading into truck / tractors-trailers for transporting them to market.

Considerations

- No blasting is required.
- Only manual extraction of sand will be undertaken.
- Trenches and pits for the mining purposes shall be made in such a way so that these are not deeper than one metre and follow the general / normal channel direction of the River and bottom is above the water table.
- With the replenishment of the pits and trenches during the floods, the process of controlled mining can continue year after year. The erosion and weathering of rocks in the catchments have inexhaustible supply of required minerals.
- Mining activity will be undertaken only during the dry seasons and dry parts of the river.

4.1 Development and Production Programme for 5 years

The proposed production for the first five year is as given in the figure 13 and Table 6 below show the production of Minerals in five years.



	First	Second	Third	Fourth	Fifth	Total
Stone	12780	12780	12780	12780	12780	63900
Gravel / Bajri	11180	11180	11180	11180	11180	55900
Sand, Silt & Clay	7990	7990	7990	7990	7990	39950
Total	31950	31950	31950	31950	31950	159750

Figure 13:Year wise Availability of Materials (in Metric tons).

4.1a Year wise Production

Table 4 Year wise production of materials.

Year	Stone	Gravel / Bajri	Sand, Silt & Clay	Total
First	12780	11180	7990	31950
Second	12780	11180	7990	31950
Third	12780	11180	7990	31950
Fourth	12780	11180	7990	31950
Fifth	12780	11180	7990	31950
Total	65970	57725	41230	164925

The proposed production is sufficient to for sustaining a viable mining project. The year wise mine working planned for the Quarry is prosented in the map 3. Year wise production of River Borne Material, sand stone and bajri is given in figures 14, 15, 16, 17 & 18.

4.2.a Development and Production at end of first Year.

- ✓ Mining of 31950 tonnes of material is proposed to be mined from 14200 square meters of safe mining area out of 15452 square metres of auctioned block.
  - ➢ 12780 metric tons of stone and 11180 metric tons of bajri will be produced and sold in open market.
  - ➢ 7990 metric tons of sand with inseparable silt & clay will be produced and sold in open market depending upon demand.
  - ► Most of the Contract Area falls within the river corridor hence negligible plantation can be undertaken in the 1st year at P1.
  - ► Most of the Contract Area falls within the river corridor, *in situ* rocks form the both the banks, therefore no retaining walls are proposed.

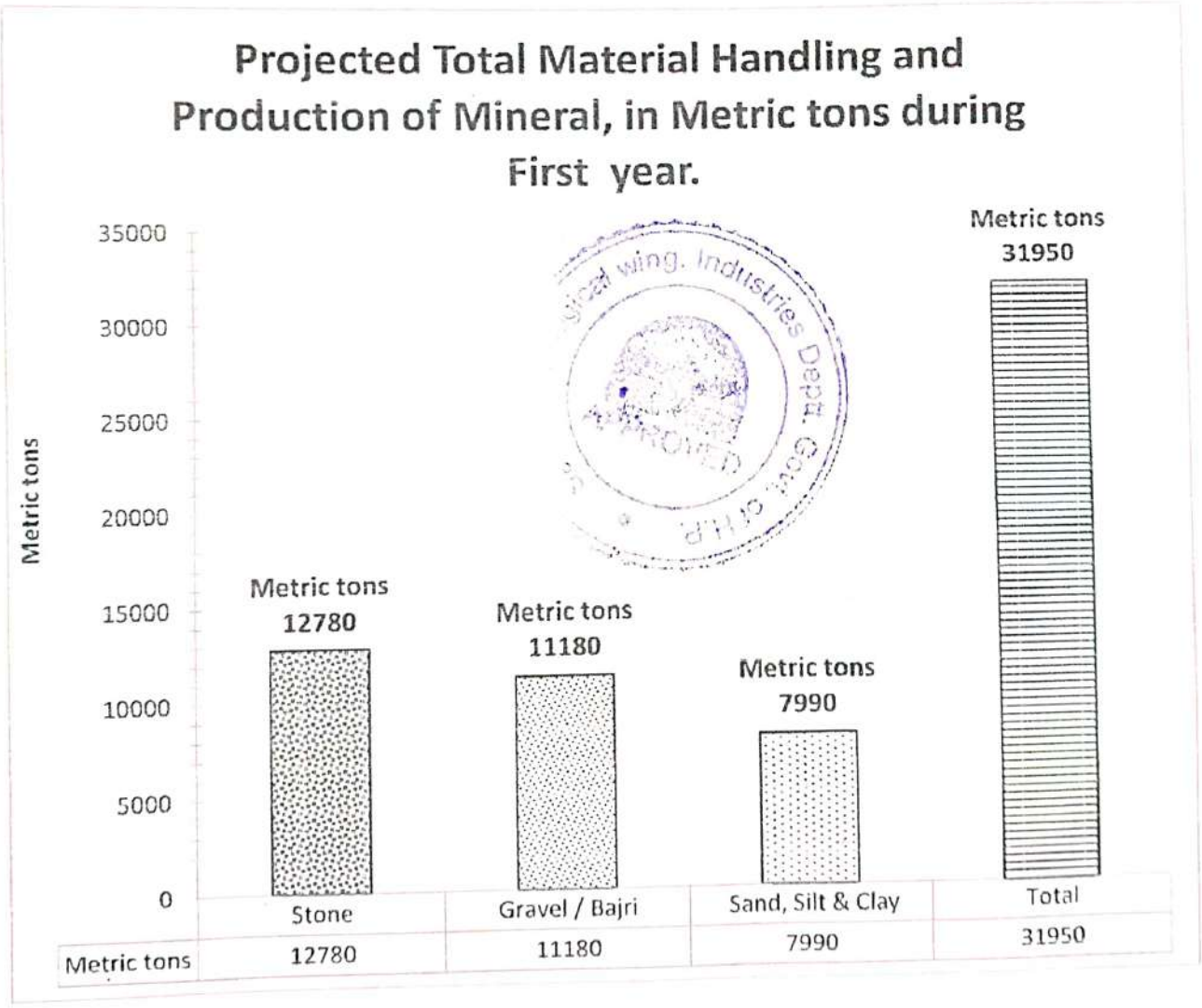


Figure 14- Proposed Production and Material Handling in the First Year of Mining.

4.2. b Development and Production at end of second Year.

During 2nd year of development and production programme:

- ✓ Mining of 31950 tonnes of material is proposed to be mined from 14200 square meters of safe mining area out of 15452 square metres of auctioned block.
  - ➢ 12780 metric tons of stone and 11180 metric tons of bajri will be produced and sold in open market.
  - ➢ 7990 metric tons of sand with inseparable silt & clay will be produced and sold in open market depending upon demand.
- ► Most of the Contract Area falls within the river corridor hence no plantation can be undertaken during the year.
- ► Most of the Contract Area falls within the river corridor, *in situ* rocks form the both the banks, therefore no retaining walls are proposed.

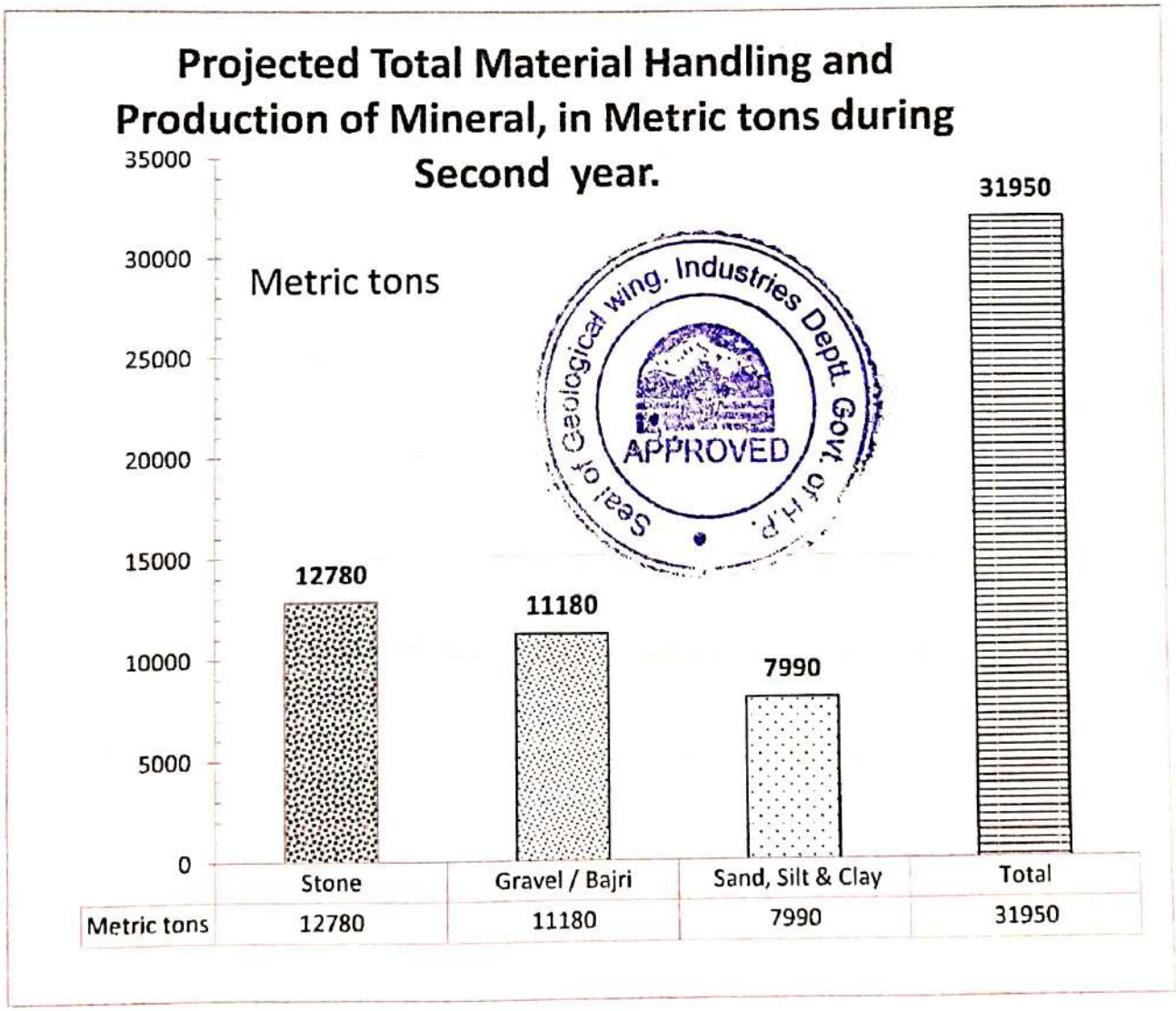


Figure 15- Proposed Production and Material Handling in the second Year of Mining.

4.2 c Development and Production at end of third Year.

During 3rd year of development and production programme:

- ✓ Mining of 31950 tonnes of material is proposed to be mined from 14200 square meters of safe mining area out of 15452 square metres of auctioned block.
  - ➢ 12780 metric tons of stone and 11180 metric tons of bajri will be produced and sold in open market.
  - ➢ 7990 metric tons of sand with inseparable silt & clay will be produced and sold in open market depending upon demand.
  - ► Most of the Contract Area falls within the river corridor hence no plantation can be undertaken during the year.
  - ► Most of the Contract Area falls within the river corridor, *in situ* rocks form the both the banks, therefore no retaining walls are proposed.

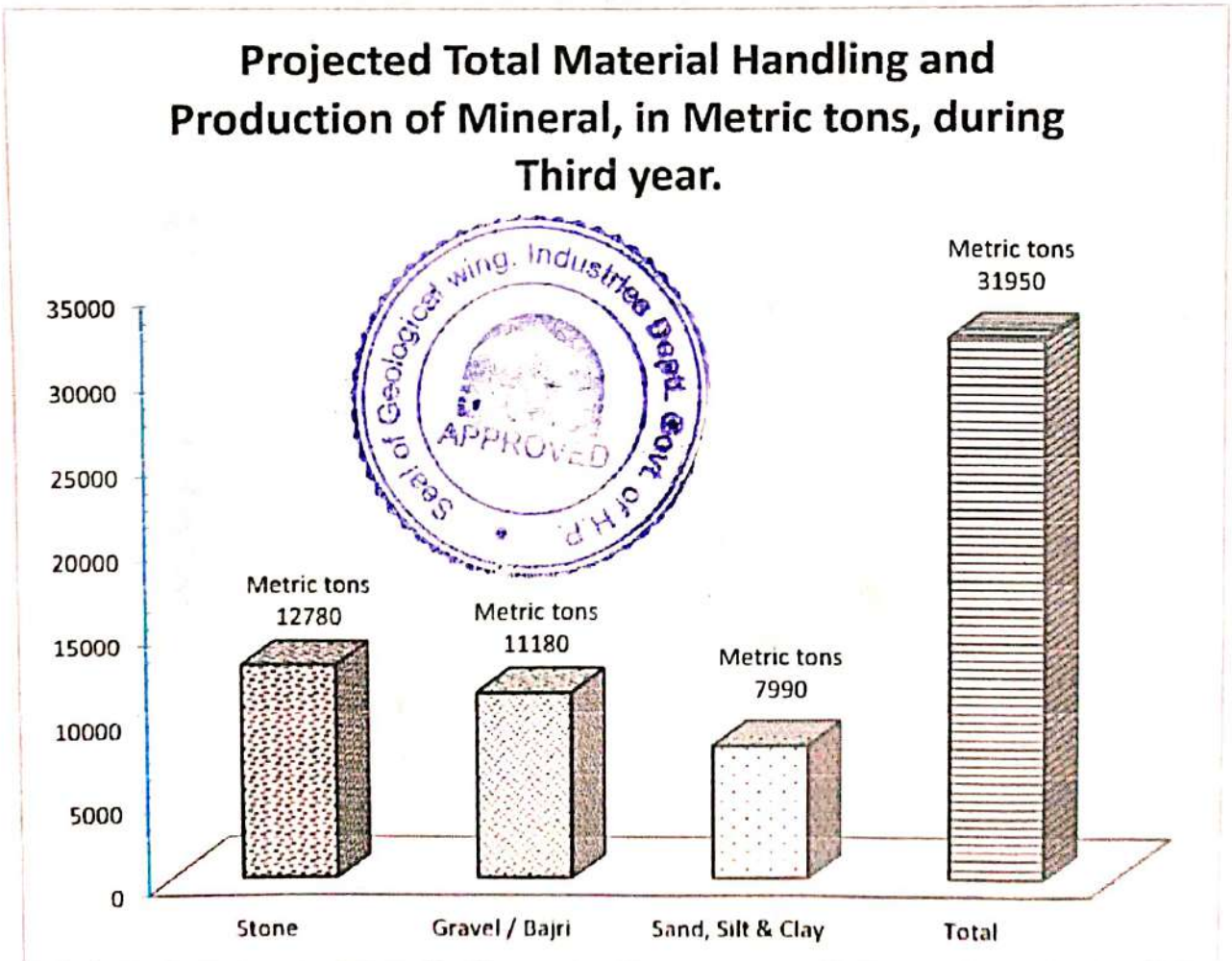


Figure 16- Proposed Production and Material Handling in the Third Year of Mining.

4.2 d Development and Production at end of fourth Year.

During 4th year of development and production programme:

- ✓ Mining of 31950 tonnes of material is proposed to be mined from 14200 square meters of safe mining area out of 15452 square metres of auctioned block.
  - ➢ 12780 metric tons of stone and 11180 metric tons of bajri will be produced and sold in open market.
  - ➢ 7990 metric tons of sand with inseparable silt & clay will be produced and sold in open market depending upon demand.
  - ► Most of the Contract Area falls within the river corridor hence no plantation can be undertaken during the year.
  - ► Most of the Contract Area falls within the river corridor, *in situ* rocks form the both the banks, therefore no retaining walls are proposed.

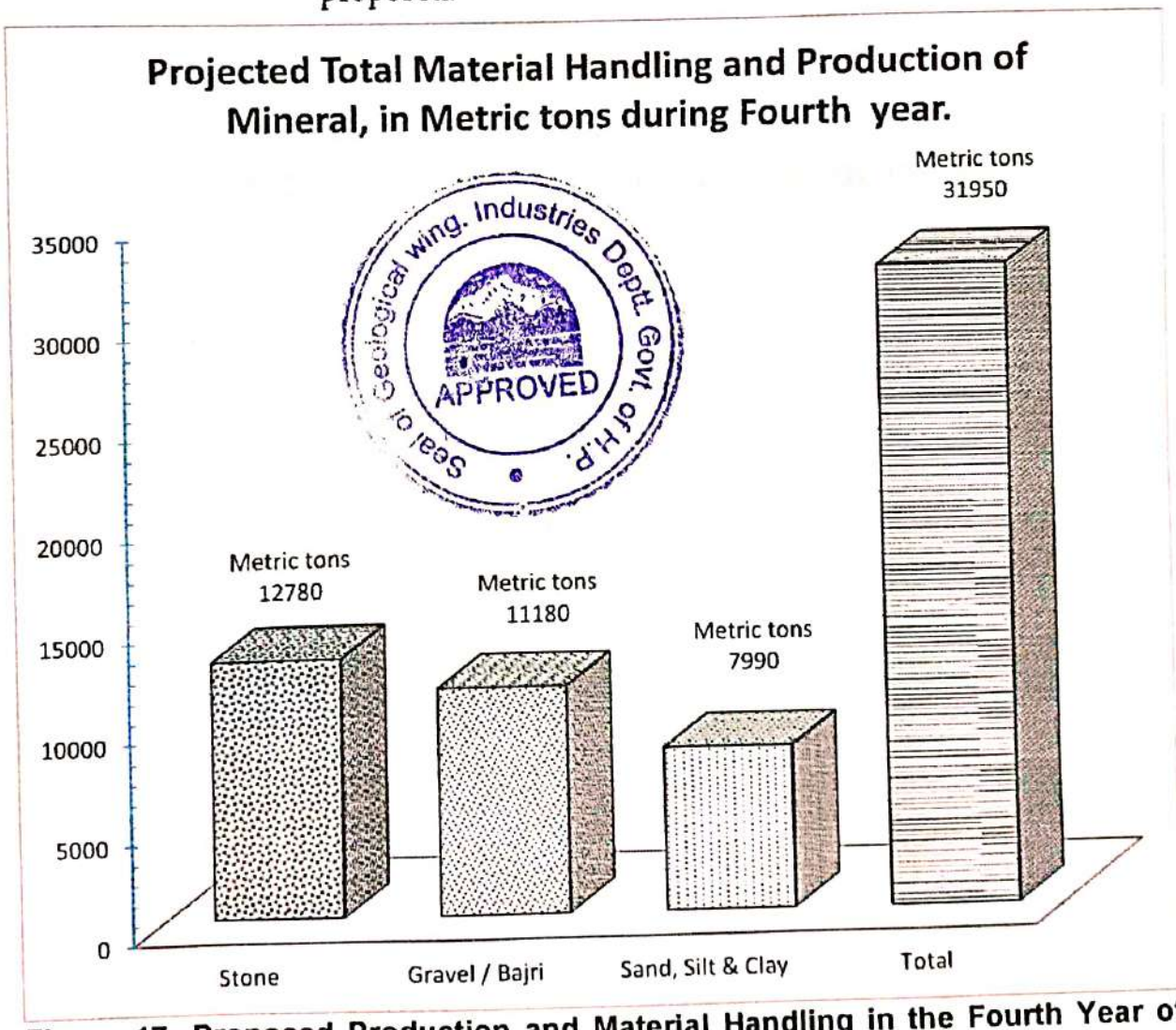


Figure 17- Proposed Production and Material Handling in the Fourth Year of Mining.

4.2 e Development and Production at end of fifth Year.

During 5th year of development and production programme:

- ✓ Mining of 31950 tonnes of material is proposed to be mined from 14200 square meters of safe mining area out of 15452 square metres of auctioned block.
  - ➢ 12780 metric tons of stone and 11180 metric tons of bajri will be produced and sold in open market.
  - ➢ 7990 metric tons of sand with inseparable silt & clay will be produced and sold in open market depending upon demand.
- ► Most of the Contract Area falls within the river corridor hence no plantation can be undertaken during the year.
- ► Most of the Contract Area falls within the river corridor, *in situ* rocks form the both the banks, therefore no retaining walls are proposed.

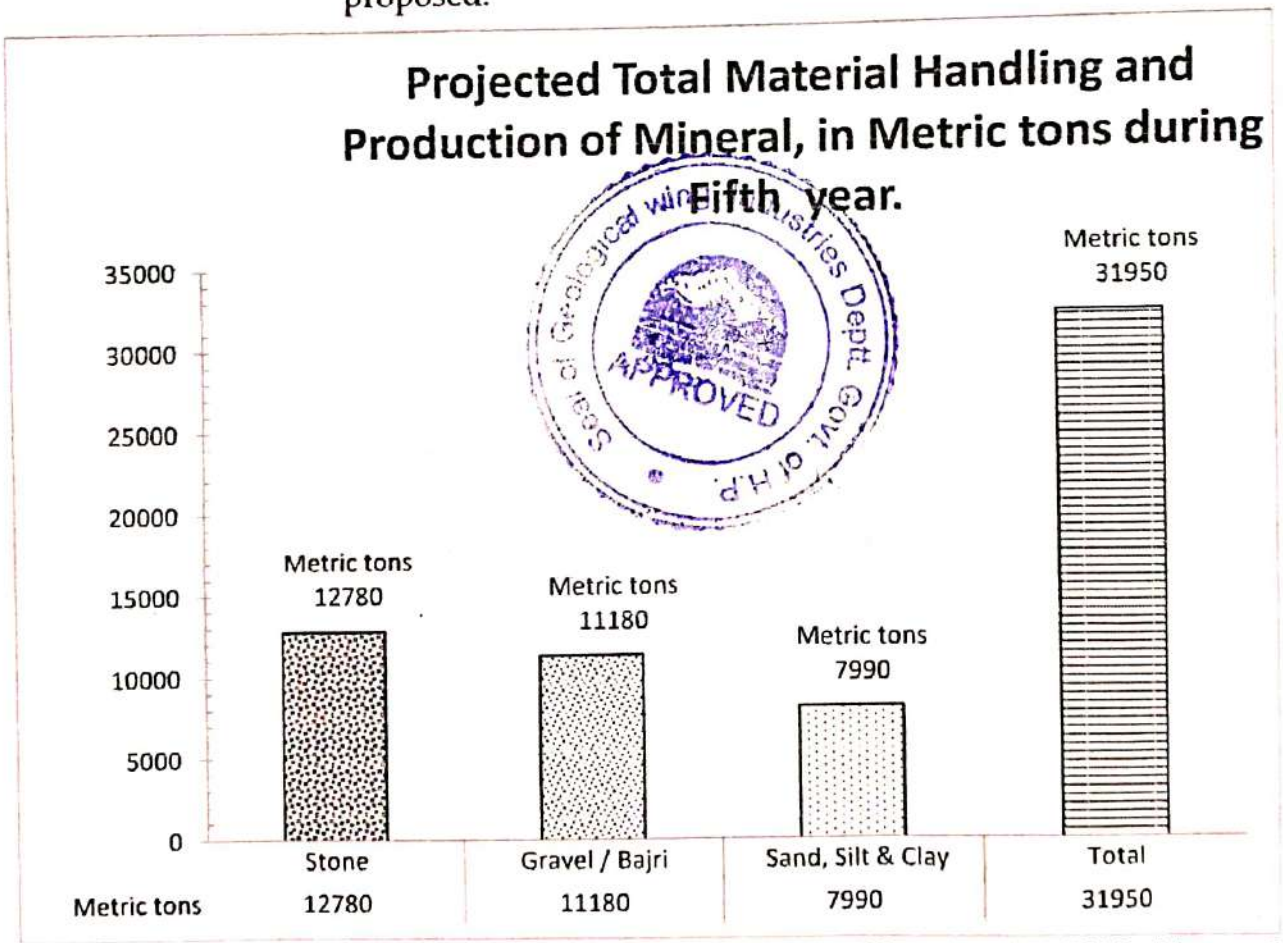
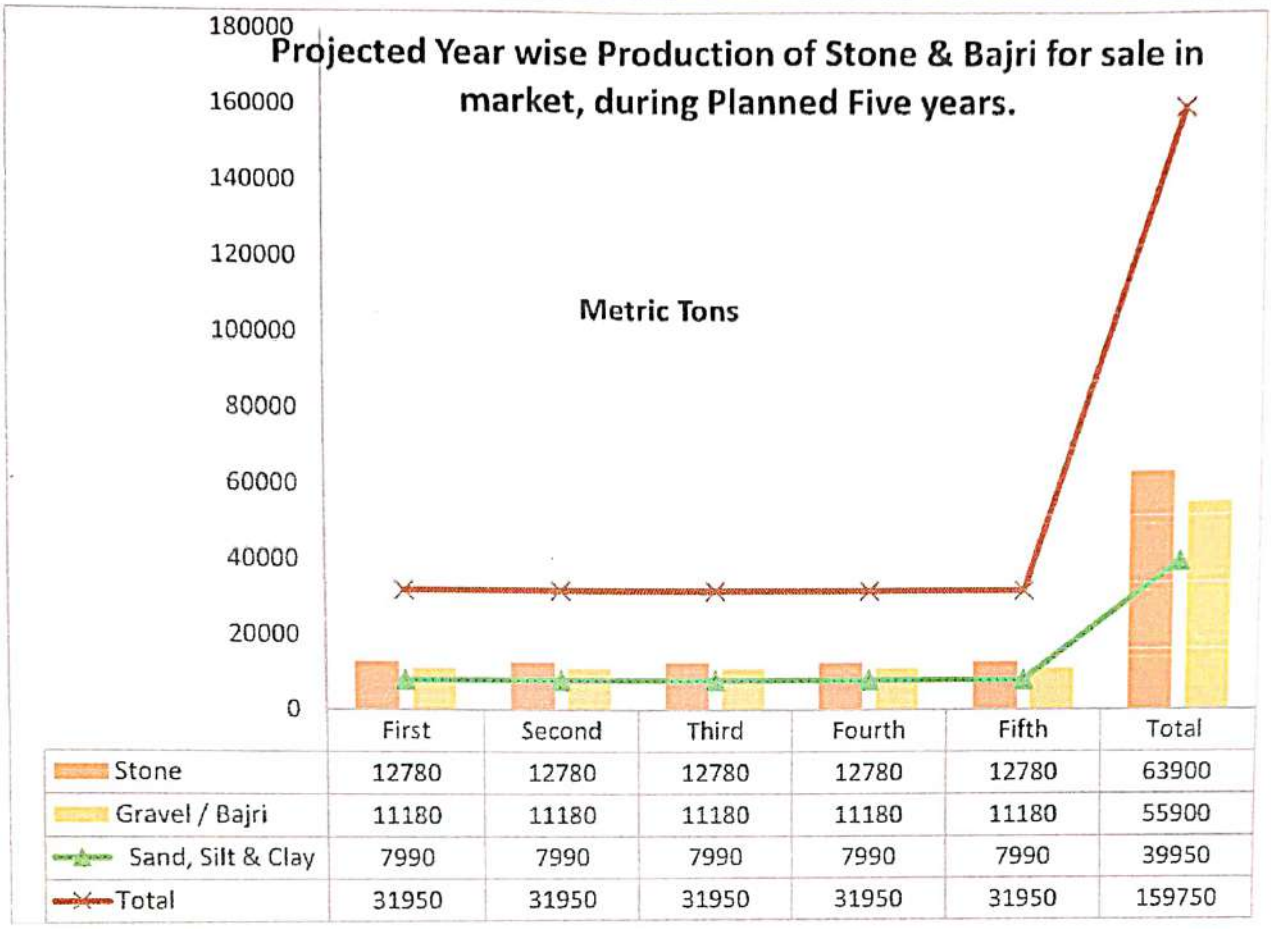


Figure 18- Proposed Production and Material Handling in the Fifth Year of Mining.

4.3 End Use of Mineral

The extracted mineral stone, sand and Bajri for will be sold at pit mouth or F.O.R. to the consumers.



	First	Second	Third	Fourth	Fifth	Total
Stone	12780	12780	12780	12780	12780	63900
Gravel / Bajri	11180	11180	11180	11180	11180	55900
Sand, Silt & Clay	7990	7990	7990	7990	7990	39950
Total	31950	31950	31950	31950	31950	159750

Figure 19: Year wise production of Stone, and Bajri.

4.4 Detail of road Transport

The maximum total extraction of minerals stone, sand and bajri for market sale would be 31950 metric tons or 118 metric tons per day, considering 270 working dry days. Thus, about 13 tipper truck trips would be required to move the material from quarry to Market. The track through River is about 100 metres from the Contract area to roadside. The evacuation route is shown in figure 20.

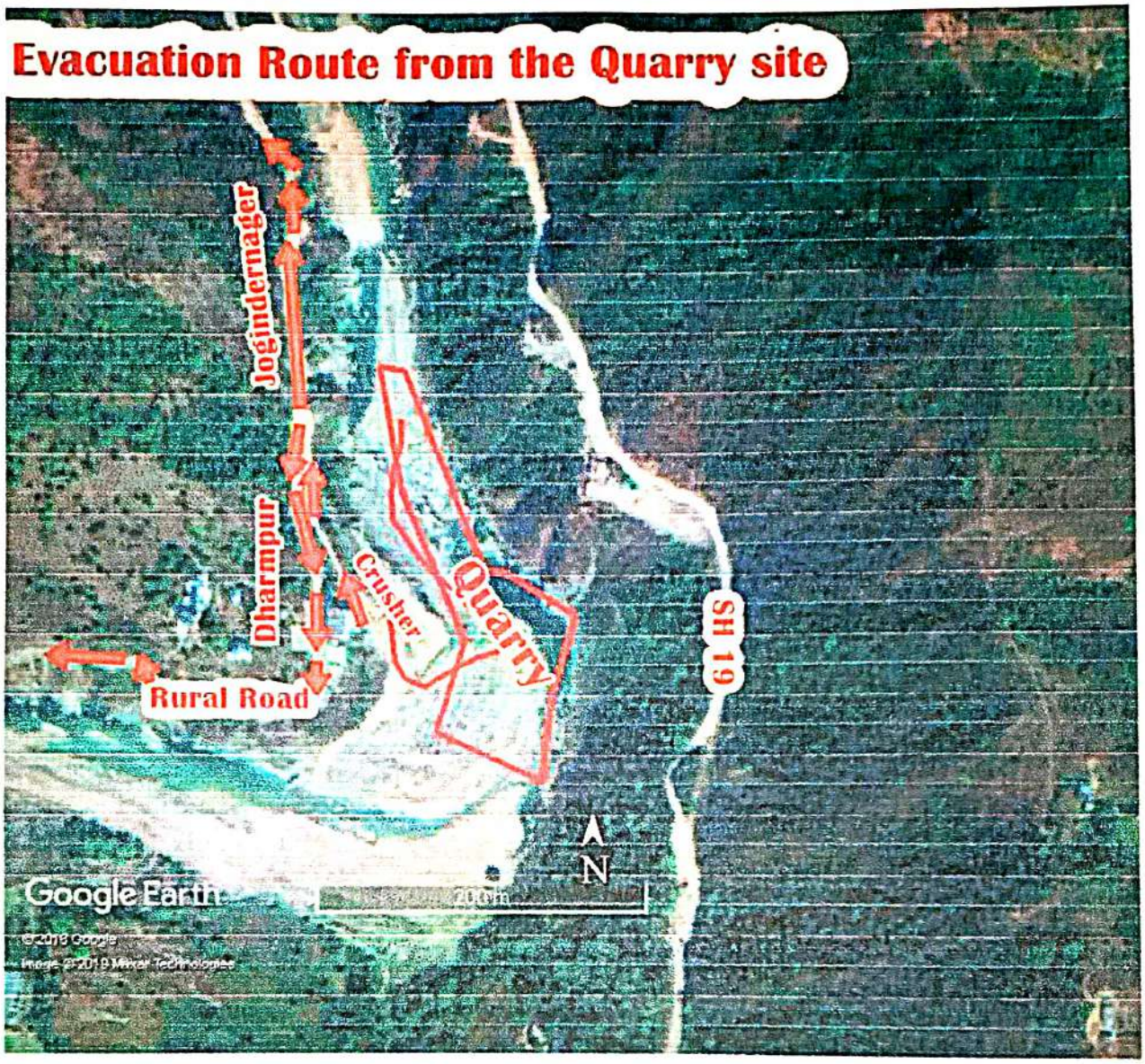


Figure 20. Evacuation route Map

PART II

1. Environment Management

1.0 Introduction

Any development activity, including mining, is likely to have adverse as well as beneficial impact on existing environment. The various environmental parameters generally impacted are as given below: -

- Change in Topography& land use pattern.
- Effect on Flora & Fauna
- Ground Vibrations and Fly Rocks.
- Effect on Hydrology
- Effect on Climate - Temperature
  - Rainfall
  - Wind Speed
- Air Quality
- Noise level
- Visual Impact
- Socio- economic Impact
- Accumulation of Scree - Mine Waste.

Base Line Data

General

Base Line Information

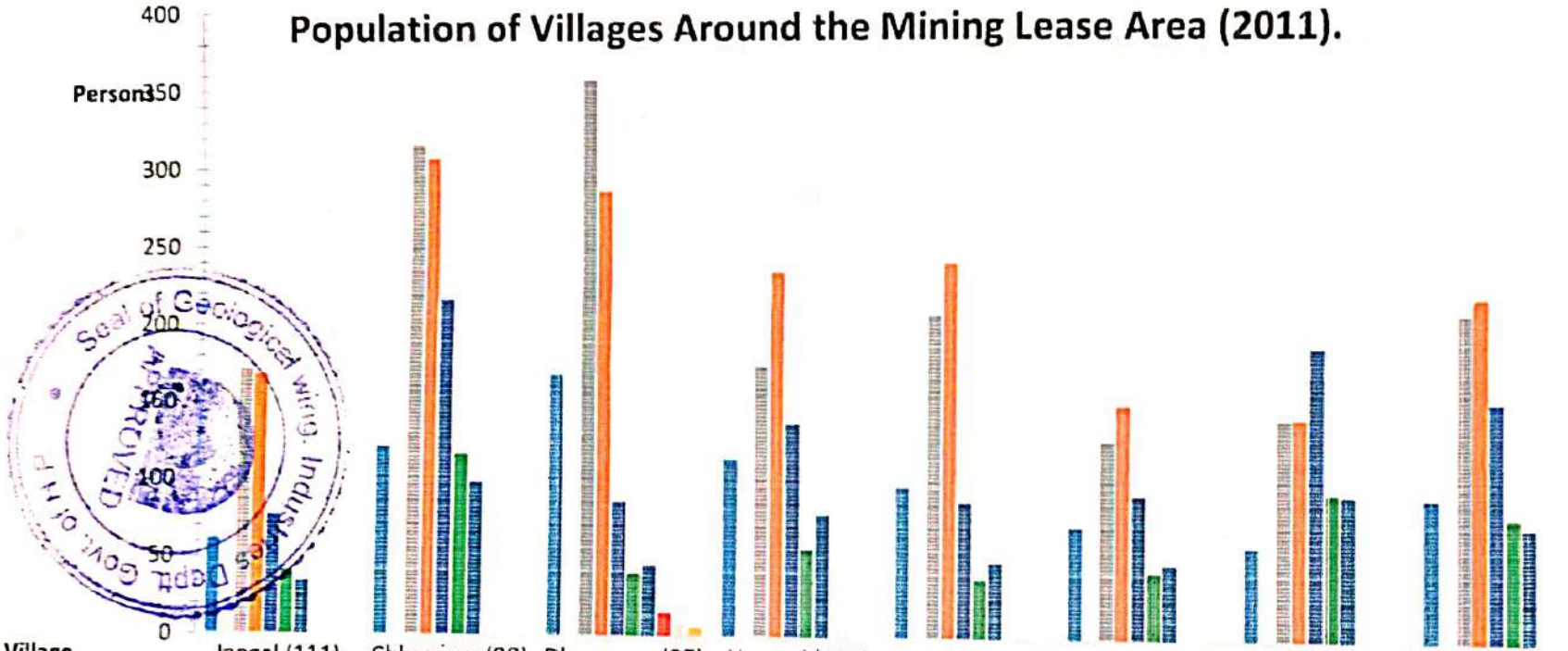
The base line information of the existing environment was collected from various sources such as

- ✓ Census Department, Government of India.
- ✓ Department of Economics and Statistics, Government of Himachal Pradesh.
- ✓ Directorate of Land Records, Government of Himachal Pradesh
- ✓ Directorate of Horticulture. Government of Himachal Pradesh.
- ✓ Fishery Department, Government of Himachal Pradesh.
- ✓ Forest Department Government of Himachal Pradesh.
- ✓ Animal Husbandry Department, Government of Himachal Pradesh.
- ✓ Survey of India, Government of India.
- ✓ Metrological Department Government of India.

to have in depth understanding of the existing environment and to assess the likely impact of mining activity in the Area.

1.2. Demography of the area

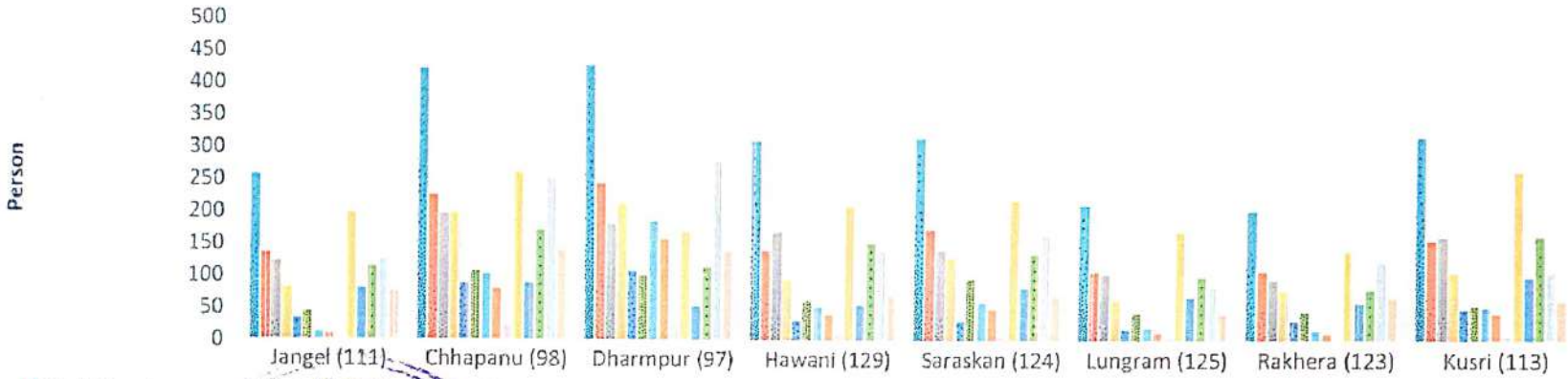
The total population of the surrounding area, as per the 2011 Census is given below in the figure 21. Education wise and employment wise break of population in surrounding villages is given in figure 22. The population details of Mandi District and tehsil Dharampur are given in figure 23.



Village	Jangel (111)	Chhapanu (98)	Dharmpur (97)	Hawani (129)	Saraskan (124)	Lungram (125)	Rakhera (123)	Kusri (113)
Total House Hold	62	121	168	115	98	73	60	91
Population	0	0	0	0	0	0	0	0
Male	171	315	357	175	209	128	141	207
Female	168	307	286	236	242	151	142	218
Schedule Caste	77	216	87	138	89	93	187	152
SC_Male	42	117	41	58	39	44	94	79
SC_Female	35	99	46	80	50	49	93	73
Schedule Tribe	0	0	16	0	0	0	0	0
ST_Male	0	0	9	0	0	0	0	0
ST_Female	0	0	7	0	0	0	0	0

Figure 21; Population of the villages of the zone of influence.

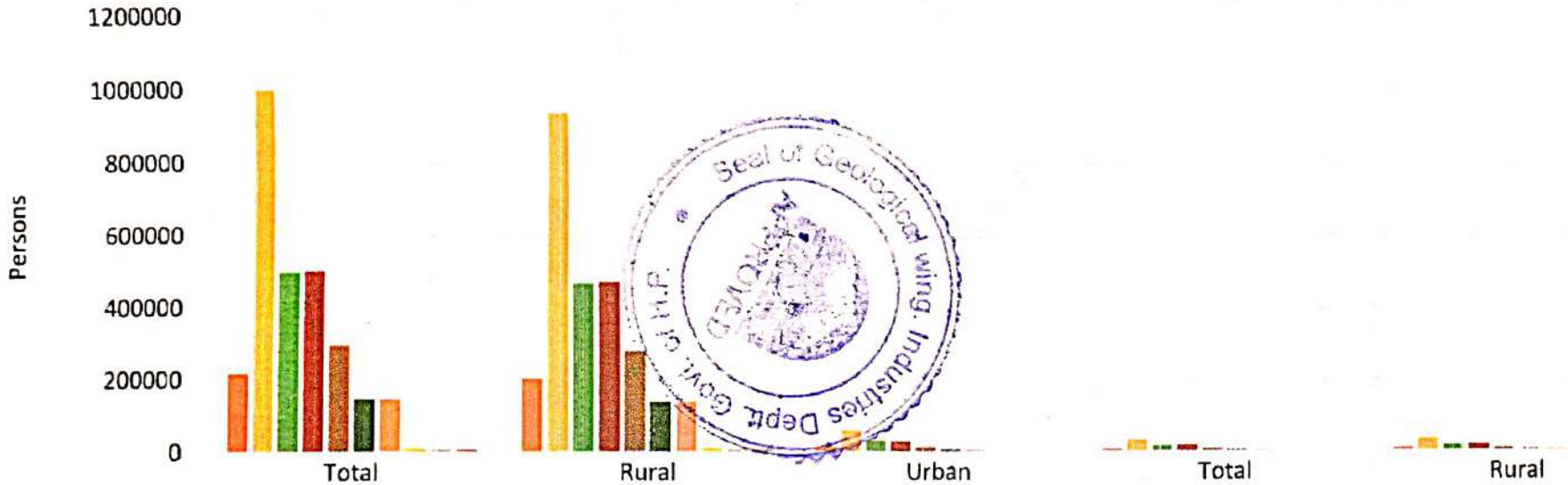
Working Categorisation of Population of surrounding villages of lease area, Tehsil Dharampur, District Mandi - (Census 2011).



	Jangel (111)	Chhapanu (98)	Dharmpur (97)	Hawani (129)	Saraskan (124)	Lungram (125)	Rakhera (123)	Kusri (113)
Total Literate	258	423	429	314	319	214	204	318
Male Literate	136	226	246	142	176	109	109	156
Female Literate	122	197	183	172	143	105	95	162
Total Illiterate	81	199	214	97	132	65	79	107
Malel Illiterate	35	89	111	33	33	19	32	51
Female Illiterate	46	110	103	64	99	46	47	56
Total Workers	14	195	188	55	62	22	18	53
Male Workers	11	82	160	43	51	14	13	44
Female Workers	3	23	28	12	11	8	5	9
Marginal Workers	198	263	172	213	222	171	141	264
Marginal Workers M	82	90	55	58	85	70	60	100
Marginal Workers Fe	116	173	117	155	137	101	81	164
Non-Workers	127	254	283	143	167	86	124	108
Non-Workers M	78	143	142	74	73	44	68	63
Non-Workers Fe	49	111	141	69	94	42	56	45

Figure 22: Break up of literacy and employment of Population in Surrounding Villages (Census 2011).

Population Break up of Tahsil Dharampur & District Mandi - (Census 2011).



	Mandi District			Dharampur Tahsil	
	Total	Rural	Urban	Total	Rural
Household	219145	203747	15398	8292	8292
Population	999777	937140	62637	34777	34777
Male	498065	466050	32015	16550	16550
Female	501712	471090	30622	18227	18227
Schedule Caste	293739	280580	13159	8463	8463
SC_Male	147250	140605	6645	4087	4087
SC_Female	146489	139975	6514	4376	4376
Schedule Tribe	12787	12359	428	23	23
ST_Male	6345	6114	231	14	14
ST_Female	6442	6245	197	9	9

Figure 23: Population break up of Tehsil Dharampur and of District Mandi (Census 2011).

1.2 Socio-Economy of the villages.

Agriculture is the main occupation of the people of the Area. About 67 percent of population directly depends on agriculture for their livelihood. Due to hilly terrain, terraced cultivation is prevalent in the area. Small and marginal farmers predominate. The marginal farmers hardly earn enough to make the ends meet. They work part time as farm labour or in Government departments. There is high rate of migration from these villages for want of employment locally.

Pie chart showing Percentage of literate and illiterate POPULATION in the area Surrounding mine area.

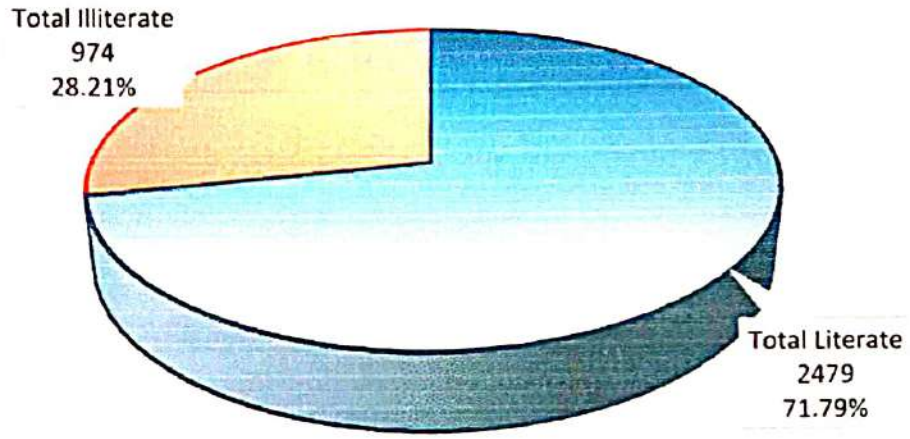


Figure 24 Literacy rate in adjoining villages.

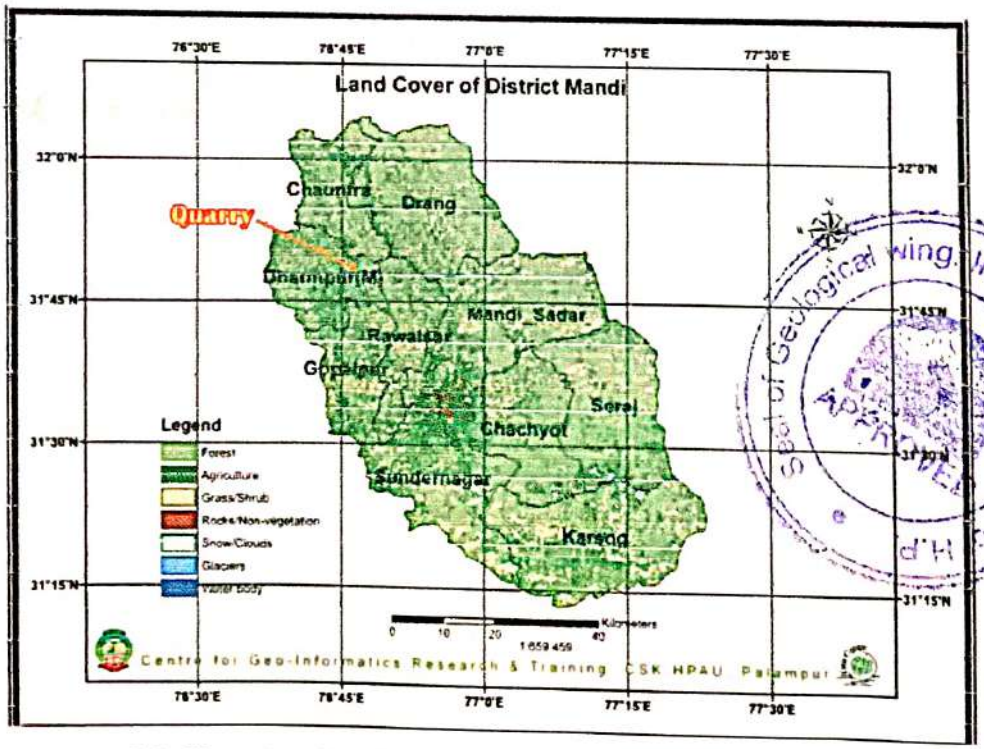
Pie Chart showing Workers, Marginal Workers and Non-workers(unemloyed) in the villages surrounding the Mining Lese Area.

Figure 25 Employment percentage in adjoining villages.

- The figure 24 & 25 depict that though 71.79 percent population is literate but only 14.972 % population has full time employment and 47.611 % are marginally employed.
- Thus, the mining project in the area have various positive impacts in the area. The mining project and *its downstream* projects of transportation and construction activity provide work to as many as 20 persons directly. Considered their total minimum earning per day to a tune of Rs. 8000 per day (@Rs.400/= per person per day), the area gets a supplementation in its financial and social wellbeing.

1.3. Land Use Pattern

1) Forest Area.	2) Area under Non-Agricultural Uses
3) Barren & Un-cultivable Land.	4) Permanent Pastures and Other Grazing Land.
5) Land Under Miscellaneous Tree Crops etc	6) Culturable Waste Land.
7) Fallows Land other than Current Fallows.	8) Current Fallows.
9)Net Area Sown	



- The land use pattern of the district is depicted in figure 26.

- Figure 26: Showing General Land Use Pattern of the District Mandi.
  - The general land use and land cover of the Buffer zone of Five kilometres radius is depicted in figure 27.

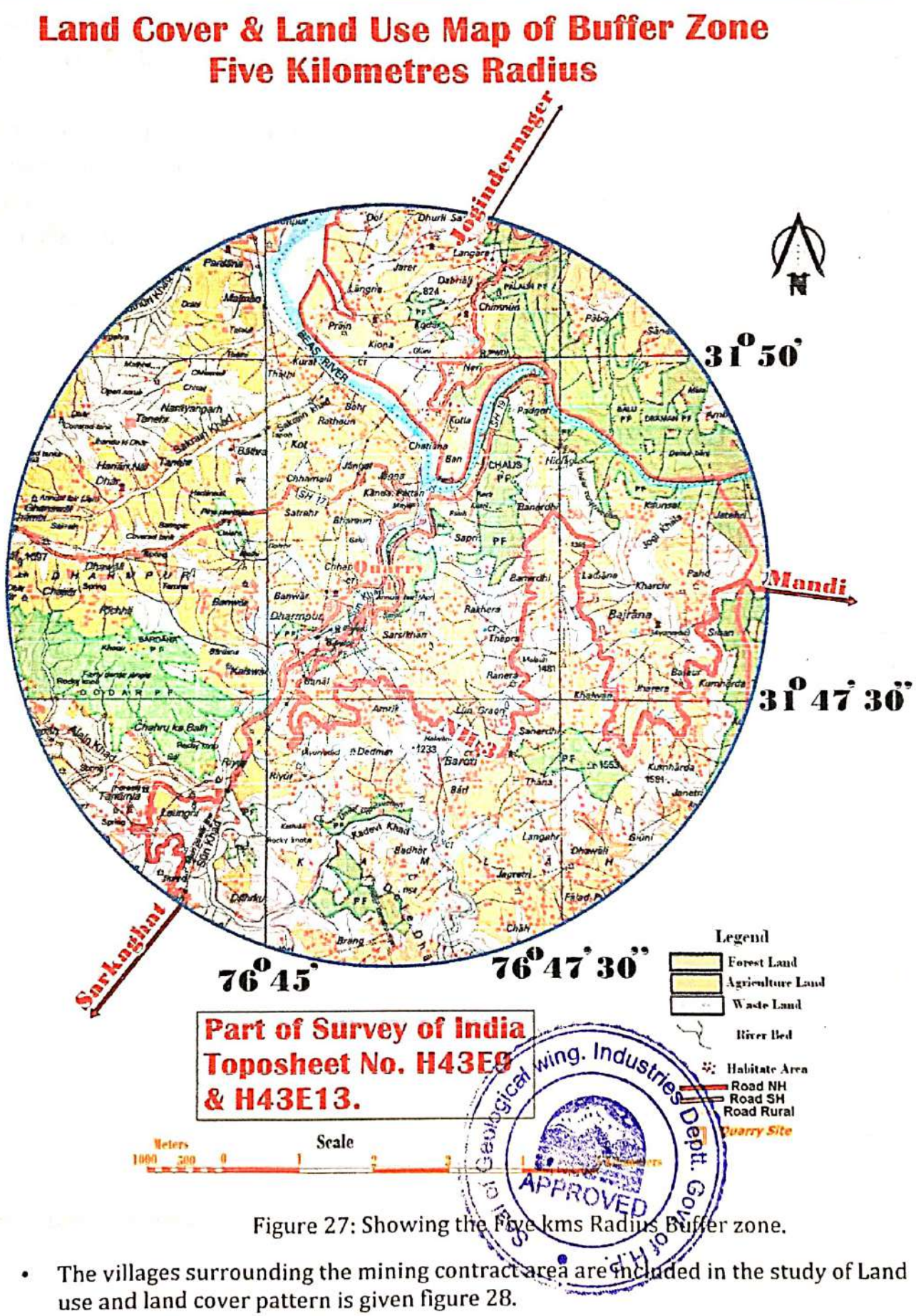
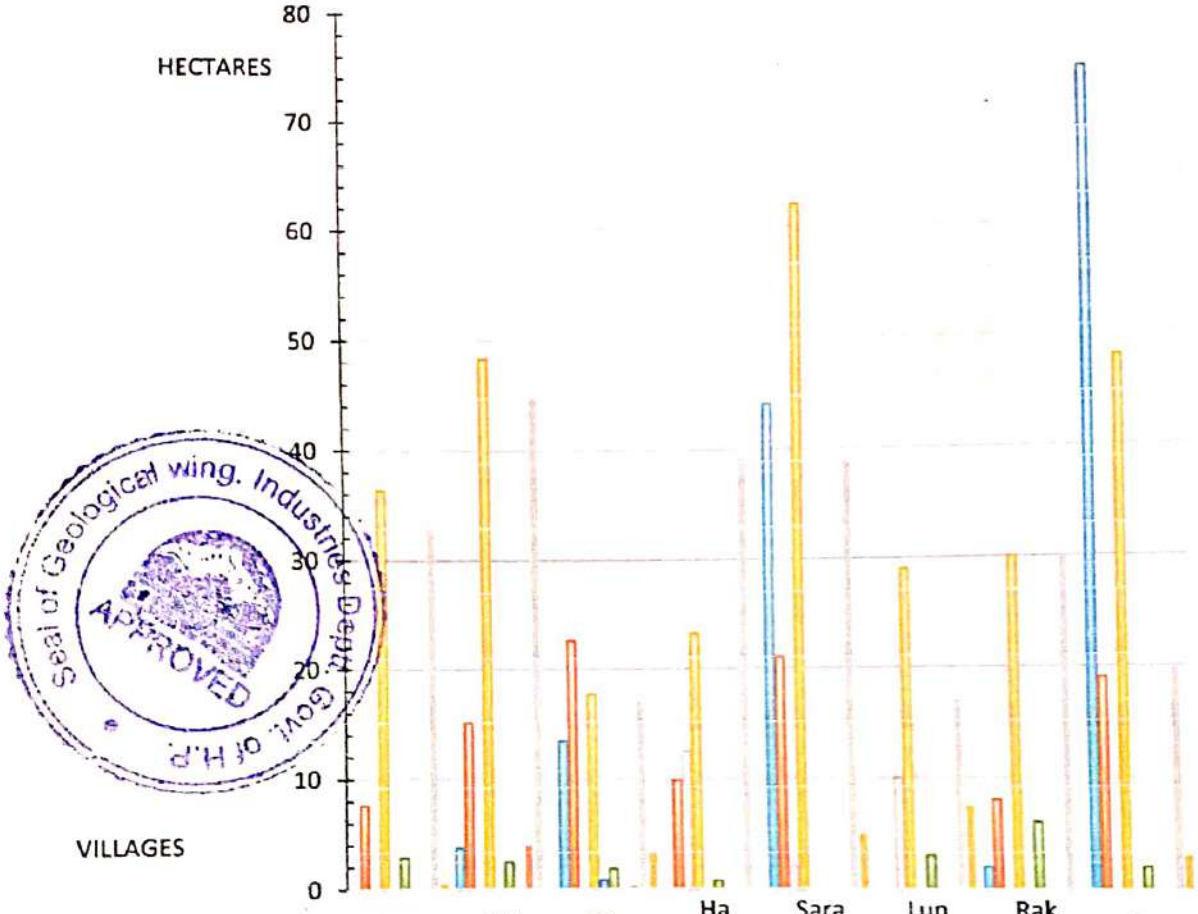


Figure 27: Showing the Five kms Radius Buffer zone.

- The villages surrounding the mining contract area are included in the study of Land use and land cover pattern is given figure 28.

  The data of villages surrounding the mining contract area falling in tehsil Dharampur, are considered for study and data is given in figure 29.

Land Use Pattern of Villges Around Mining Lease Area (Census 2011).



	Jangel (111)	Chhapanu (98)	Dharmpur (97)	Hawani (129)	Saraskan (124)	Lungram (125)	Rakhera (123)	Kusri (113)
Forest Area	0	3.72	13.4	0	44	0	2	74
Area under Non-Agricultural Uses	7.57	15.09	22.65	9.86	21	0	8	19
Barren & Un-cultivable Land Area	0	0	0	12.5	2	10	0	0
Permanent Pastures and Other Grazing Land Area	36.39	48.36	17.71	23.26	62	29	30	48
Land Under Miscellaneous Tree Crops etc. Area	0	0	0.78	0	0	0	0	0
Culturable Waste Land Area	2.82	2.38	1.79	0.73	0	3	6	2
Fallows Land other than Current Fallows Area	0	0	0	0	0	0	0	0
Current Fallows Area	0	3.99	0.3	0	0	0	0	0
Total Unirrigated Land Area	32.87	44.64	17.05	39.27	39	17	30	20
Area Irrigated by Source	0.49	0.17	3.29	0.06	5	7.49	0	3

Figure 28: Showing Land Use Pattern of villages around the mining contract area.

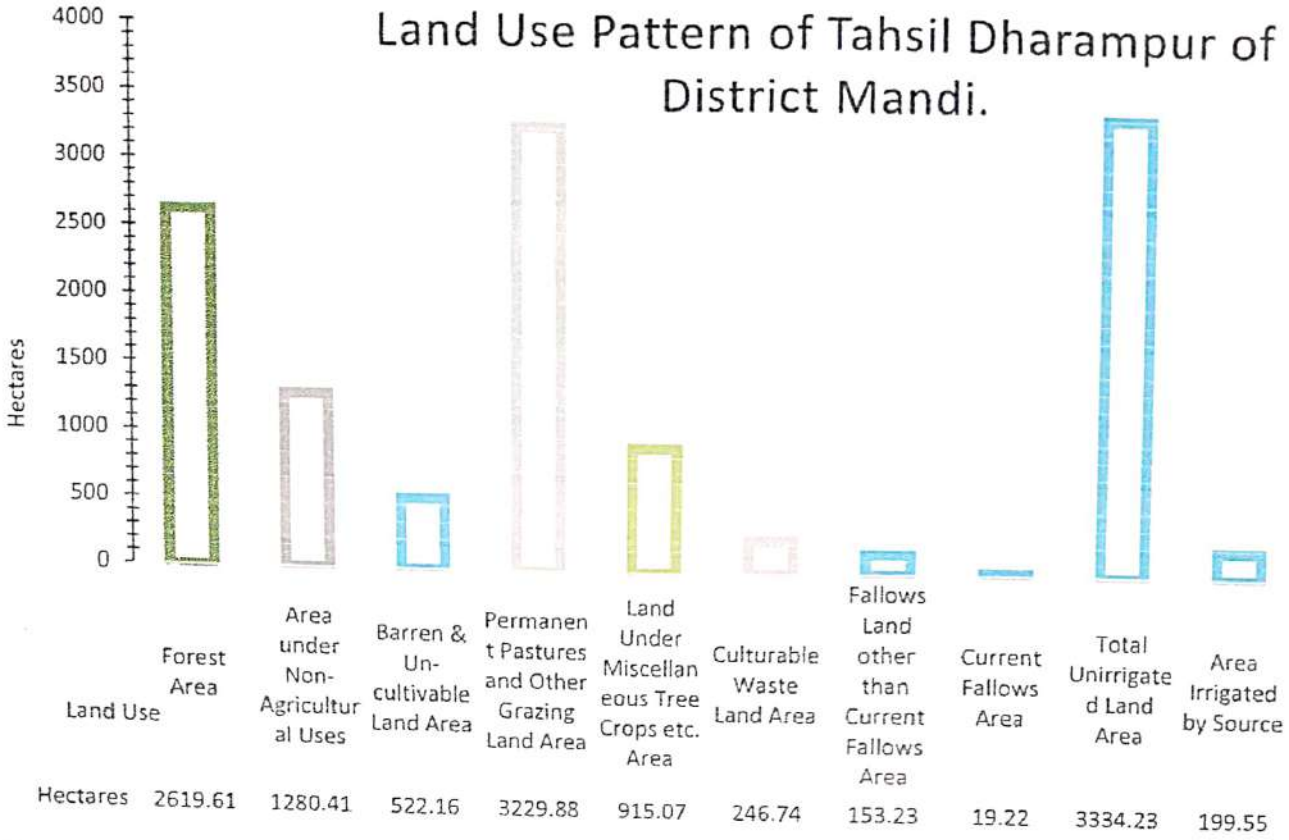


Figure 29 land use Pattern of Dharampur Tehsil.

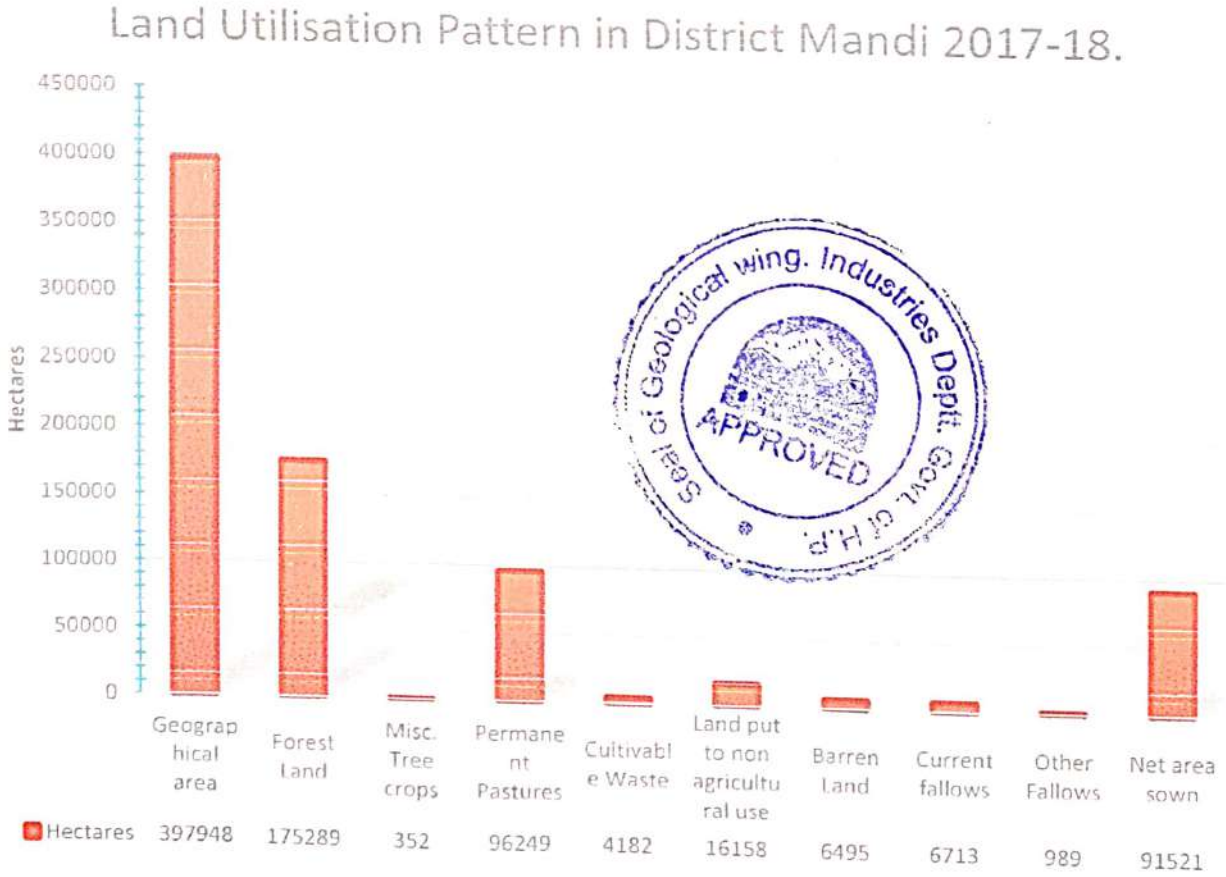


Figure 30: Land Use Pattern of District Mandi.

1.4 AGRICULTURE: -

The economy of Mandi district is predominately agrarian as around 80 per cent of the total population is dependent on agriculture and activities allied to it for earning their livelihood. The moisture retention capacity of the area is poor due mainly to the fact the bed rocks are argillaceous and the land the uneven. The crops usually face moisture stress during the remaining period of the year due to inadequate and irregular rainfall. The irrigation facilities are provided by lifting water from steams, shallow dug wells and medium to deep tube wells in the valley area.

The source of water and irrigation in district Mandi can be classified into following five classes

- Lift Irrigation Scheme,
- Kuhls,
- Well used for domestic purposes,
- Well used for irrigation,
- Tube wells/

Major food crops are grouped into three categories:

- Cereals,
- Pulses,
- Other food crops like Chilies, ginger, sugarcane and turmeric.
- Non- food crop area is of two kinds:
- Oil seeds,
- Other non-food crops such as cotton, tobacco and fodder crop,

The area under each category of the crop is given below in figure: -31.

Figure: -32 show production of agriculture produces in district Mandi.

The area under vegetables and their production is given in the figure: -33.

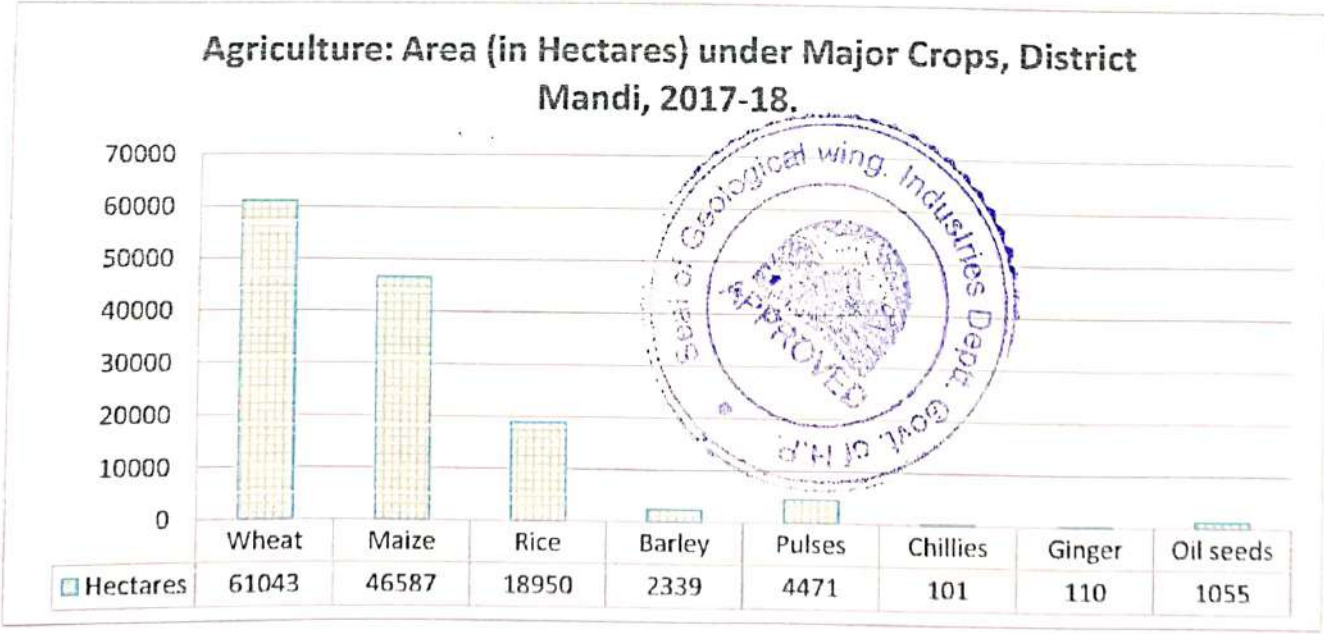


Figure 31: : Showing area under different crops in Mandi District.

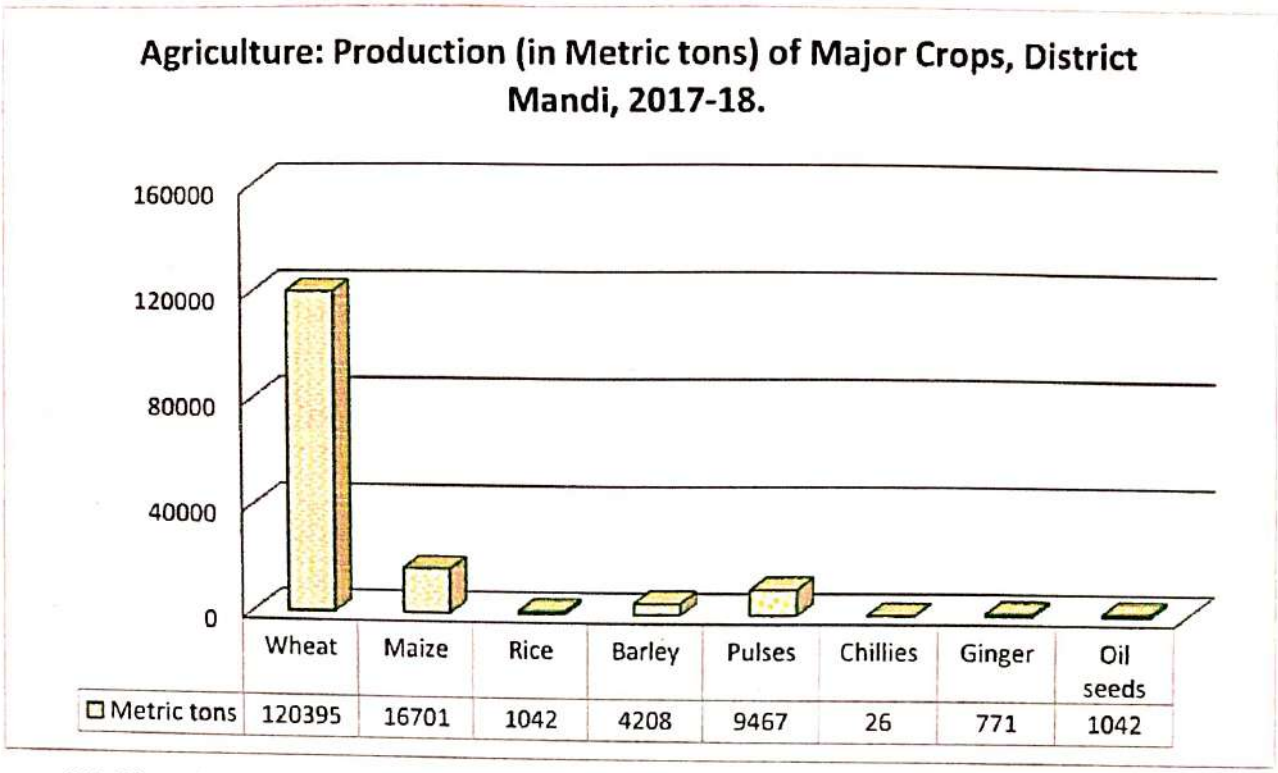


Figure 32 Showing production of each crop in District Mandi.

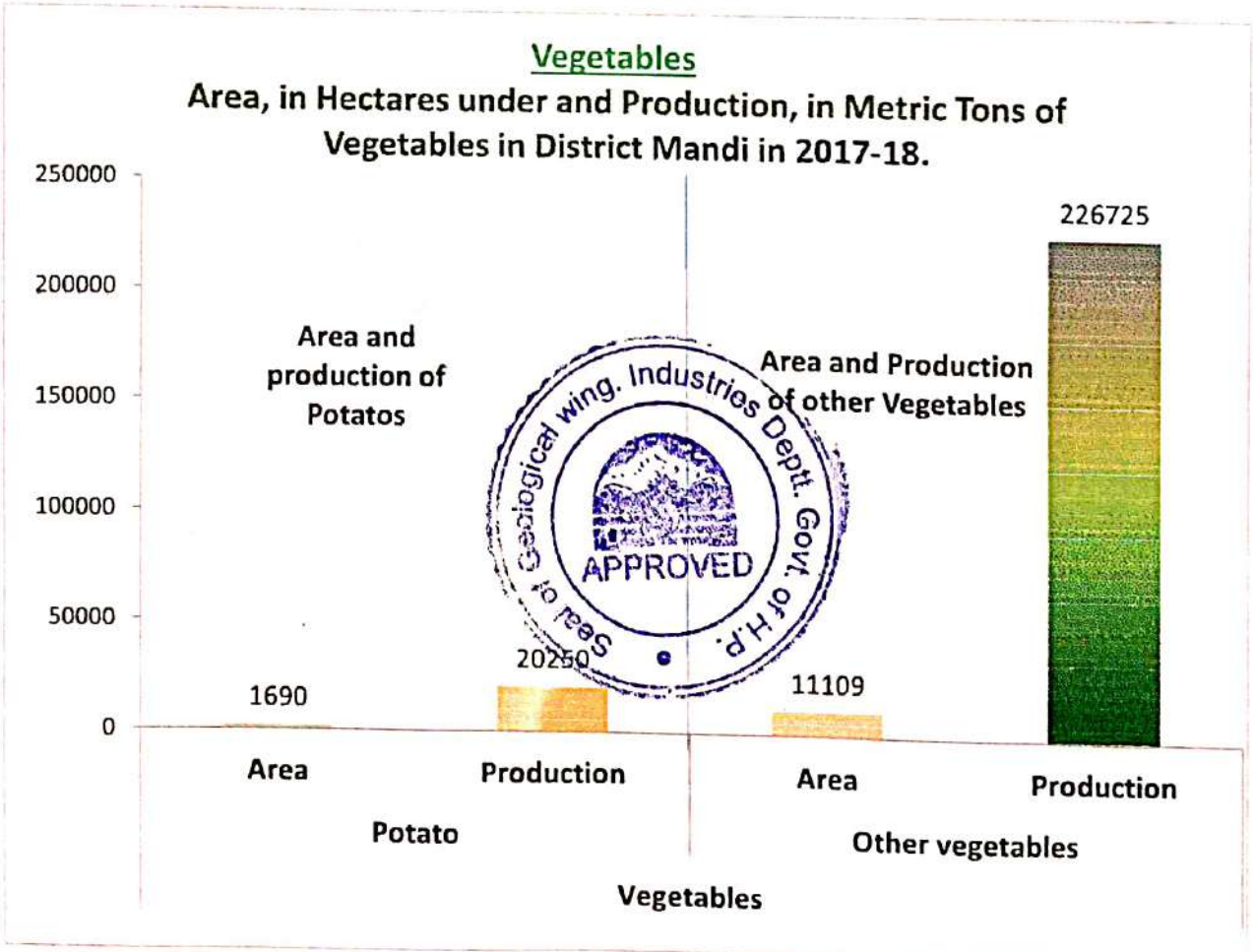


Figure 33: Showing area under vegetable, in Hectare and Production, in Metric tons, of District Mandi.

1.5 HORTICULTURE: -

The topography and the agro- climatic conditions of the district are quite suitable for the production of the various fruits. The topography of the district can be grouped into three categories namely high hill areas located at a higher elevation, mid hill areas and low lying valley areas. Fruits of various kinds depending upon the terrain, climatic condition and soil are grown in the district.

The main horticulture produce of the area can be classified into following five categories.

1. Apple
2. Other temperate fruits
3. Subtropical fruits
4. Nuts and dry fruits
5. Citrus fruits

The area under each fruit as well as the production of each fruit in district Mandi are shown in Table 3 as per 2013- 2014 survey.

Table 5; Area under each fruit and their production in District Mandi.

Status of Horticulture District Mandi.2017-18		
Fruit	Area (In Hectares)	Production (In Metric Tons)
Apple	16638	42078
Plum	2862	736
Peach	785	440
Apricot	289	290
Pear	178	1210
Cherry	25	6
Green Almonds	0	0
Persimmon	247	88
Olive	8	5
Kiwi	29	17
Strawberry	2	0
O T F	6034	2792

Almonds	1515	280
Walnut	1059	131
Piccanut	397	19
Nuts & Dry Fruits	2971	430
Orange	748	253
Malta	27	0
K. Lime	3047	239
Galgal	545	349
Others	3	0
Citrus	4370	841
Mango	4962	1950
Litchi	531	756
Gauva	687	288
Papaya	25	28
Loquat	4	0
Aonala	152	69
Grapes	2	6
p-gmate	479	196
Jackfruit	186	38
Others	8	17
O S T F	7036	3348

1.6 Animal Husbandry

Economy of the district is predominantly agrarian but role of Animal Husbandry is equally important as the farmers have to keep the cattle for the purpose of ploughing the land and to obtain manure for maintaining fertility of the fields and to meet daily need of milk of their family.

The total population of the livestock in District Mandi is given in the figure: -34. The population of the Buffaloes and Cattle in District Mandi is given in the figure: -35.

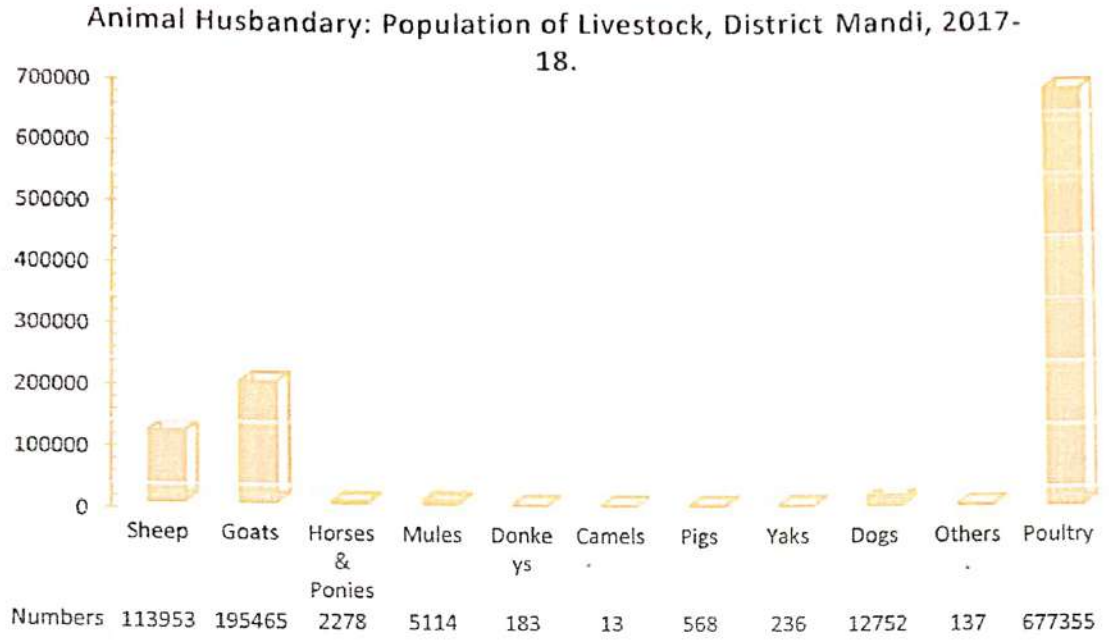


Figure 34: Livestock population of District Mandi.

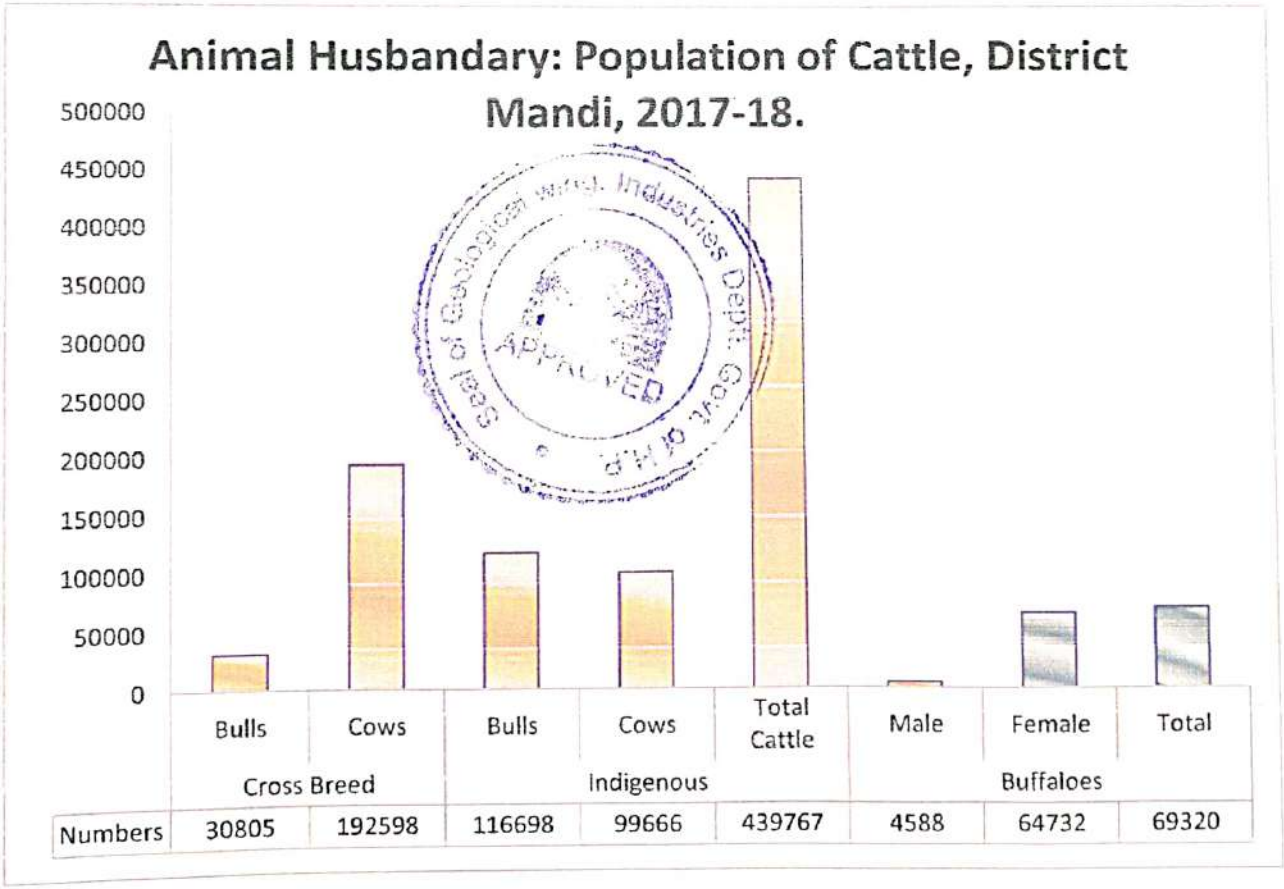


Figure 35: Showing Population of Cattle Buffaloes in District Mandi.

1.7 Fisheries

There is a vast network of perennial rivers, khads and streams in the district. Following prominent of fish family are found in the rivers and streams of Mandi district:

Trout

Mahasir

Gid Seviyon

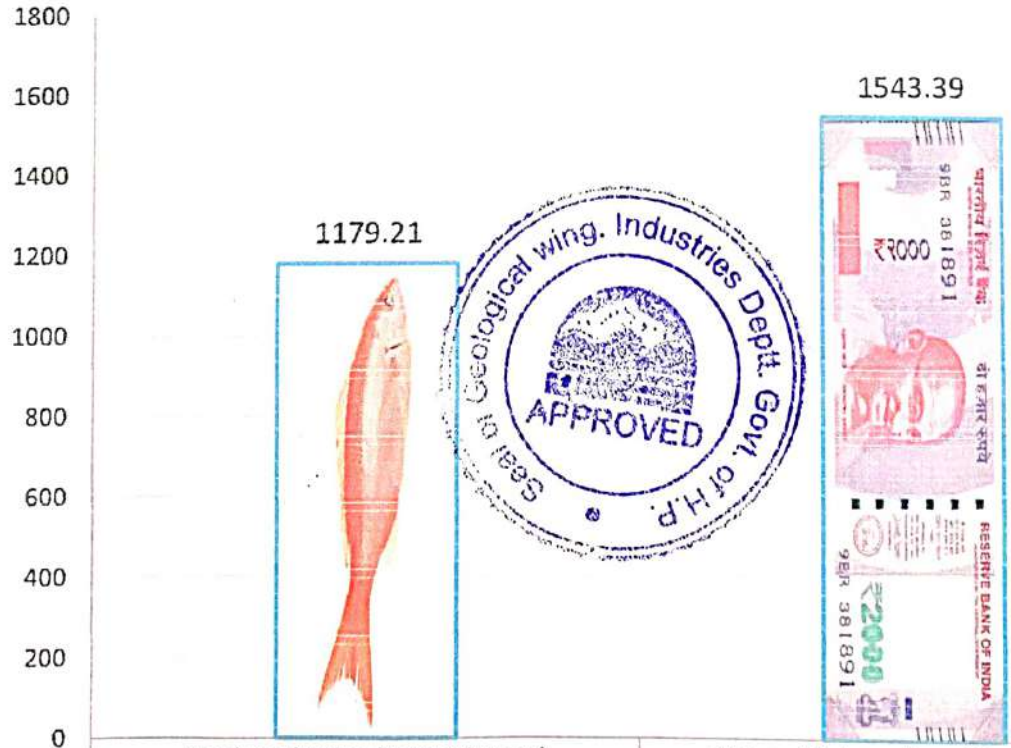
Dise Gugli and

Mirror Carps

The exotic trought fish species are found in Uhl, Lambadag and Tirthan. A trout hatchery is maintained at Barot. The Mahashir fish is found in river Sutluj near Dehar while Barbustor, Gid, Kuni and Himalayan Barble are found in Uhl and satluj tributaries. River Uhl, Pandoh, Mandi, Kunkatar, Sandhol, Dehar, Barot, Kamand, Balichowki are famous for trought fishing.

No perennial stream passes through the area under consideration.

Fisheries: Annual Production and value of catch, District Mandi, 2017-18.



	Total Production (in Metric tons)	Value of fish produced (Rs. In lakhs)
Fisheries	1179.21	1543.39

Figure 36: Showing Fish catch / production and its sale value in 2015-16.

1.8 Flora and Fauna

1.8.1 Flora

The Chil is considered the prevailing conifer up to about 1950 meter when it gives place to the Deodar and the blue pines. In Mandi district the forest range between scrub, sal and bamboo forest of the low hills to the fur and alpine forests of the higher elevation. Lowest point of the southern boundary of the district is 427 meter above sea level and highest range of is at an elevation of 2658 meters in the north. The forests grown between these two extremes vary as the elevation itself.

In the area under consideration following are the most common trees

The most prominent varieties of trees found in the district are

Simbal (Bombex malabaricum),

Mango (Magniferaindica)

Tun (Cedrela toana)

Several species of acacia and albizia

Salambra (Odina wodier)

Termnalia

Jamun (Engenia jambolana

Larger tour

Bamboo

The common fruit trees are banana, apple, ber, jamun, mango, mulberry, almond, peach etc

Shrubs

The most common shrub at the higher elevation is Barberis, indigopera and Desmodium and following other shrubs are also found

1. Vitex
2. Munj
3. Ber
4. Ipomea
5. Dodonea &
6. Bamboo.

The common fruit trees are banana, apple, ber, jamun, mango, pear, mulberry, apple, almond, cherry, peach etc

1.8.2 Fauna

Animals

Due to wide variations in the attitude a large variety of fauna is available in the forests of the district. The black bears are common in the higher valley. The leopards are found throughout the district. Barking dears and gural are found at medium elevation the musk deer or Kastura and serao are found in the district. Common Mammals & Birds in the Mandi District is given in the Table :-7

Table 7: Common mammals and birds in the Mandi District.

Table 6

Birds		
Zoological Name	**English Name**	**Common Name**
Milvus migrants	Vulture	Cheel, Gidh, Eell
Eudynamys scolopacea	Koel	Koel
Columbia livia	Pigeon	Kabuttar
Coracias bengalensis	Blue jay	Nilkantha
Colums livia	Hawk	Baj
Francolius francolinus	Black partridge	Kala Tittar
Francolius pondicerians	Grey partridge	Safed Tittar
Payo crisslatus	Peacock	Mor
Coturnix colurnix	Common qua	ater
Alectoris graeca	Chakor	Chakor
Crovus splendens	Crow	Kanwa
Prottacula Karneri	Parrot	Totta
Tragopan melanocephalus	Western horned Tragopan	Phulgar/Jujurana
Picoides macei	Fulvourbreasted Pied Woodpecker	Kathfowra
Streptopelia decaocto	Ring dove	Gughi
Streptopelia chinesis	Spotted dove	Gughi
Accipiter badius	Shikra	
Aquila rapax vindhian	Tawny eagle	

Ducula bicolor	Green Pigeon	
Parus rufonuchalis	Tits	
Picus canus	Black napped Woodpecker	Woodpecker
Drycocopus javensis	Woodpecker	
Muscicapa subrubra	Himalayan Fly Catcher	
Acidotheres tristis	Common Myna	Ghatari
Terpsiphone paradisi	Paradise flycatcher	Choti- Pinja
Passer domesticus	House sparrow	
Cardnelis spinoides	Himalayan Green Finch	Chiria

Table 7

Mammals in Mandi

Zoological Name	English Name	Common Name
Felis bengalensis	Leapard Cat	Mirag, Bagh
Felis Chane	Jungle Cat	Jangli Billi
Muntucus muntisk	Barking Dear	Kakkar
Vaulpes bengalensis	Fox	Lomari, Pohiki
Camis aureus	Jackal	Gidder
Macaca mulatta	Ressus monkey	Lal Bander
Preshytes entellus	Languor	Languor
Sus sacrofa	Boar	Suar
Hystrix indica	Porcupine	Sehal
Lepus nigricoilis	Hare	Khargosh, Sherru, farru
Moschus moschifarus	Musk deer	Kastura
Capra ibex Ibex	Ibex	
Hemitragus jemlahicus	Himalayan Thar	Thar
Selenarctos thebatanus	Black Bear	
Ursus arctos	Brown Bear	
Panthera unica	Snow leopard	
Sus scrofa	Wild Boar	
Axis axis	Spotted deer	Chital

Cervus unicolor	Samber	
Hylopetes fimbriatus	Flying squirrel	
Panthera pardus	Leopard	Cheetah
Felis chaus	Jungle cat	
Paradoxurus hermaphroditus	Indian Civet	Sakralu
Hipposideros armiger	The great Himalayan leafnosed Bat	Chamgadar

In the area surrounding the mining contract following are the common birds: -

- Chakor
- Crow
- Red Jungle Fowl (Jangli Murga)
- Black Partridge (Kala Titar)
- Grey Partridge (Safed Titar)
- Woodpecker

In the contracted out area and surrounding hills following are the common animals: -

- Leopard (Bagher)
- Hare
- Wild Bore (Jangli Soor)
- Jackal
- Barking Deer (Kakkar)
- Monkey
- Sambar
- Pig

1.9 Climate

The climate of district is hot in summer as it is situated in valley at lower altitude while surrounding mountains top experience pleasant weather and cold in winters. Monsoon brings plenty of rain from July to September. October to November is pleasant weather, during this time Lake is completely full. Hottest months are May and June when temperature usually hover around 37-38 degree Celsius and sometimes for few days jumping to above 40 degrees Celsius, the nights are comparatively cooler, and month wise temperature is given in figure 7.

The area enjoys monsoon rainfall from third week of June to mid-September.

The rainfall records available with the District Collectors office from 2004 to 2014 are depicted in the figure 8.

The climatic information given is based on the data obtained from Revenue Department of Himachal Pradesh. The Indian Meteorological Department is maintaining a Meteorological Station at D.C office Mandi, and at Sundernager. All information available indicates following seasons in the District:

Winter	**Dec. – March**
Summer/Pre-monsoon	**April- May**
Monsoon June-	**September**

2 ENVIRONMENT MANAGEMNET PLAN

Any development activity such as mining is likely to have beneficial as well as adverse impact on existing environment on following parameters:

- Change in Topography and Land Use Pattern
- Climate
- Air Quality,
- Noise level and Ground vibrations,
- Flora & Fauna
- Soils
- Water Resources and Quality,
- Drainage,
  and
- Socio- economic conditions

2.1 Change in Topography & land use pattern.

- The contract area is part of foothills of Himalayas.
- It is part of a Riverbed.
- The highest contour of the contract area is at 628 metre above mean sea level.
- The lowest contour is at 623 m above MSL.
- Mine Area is compact one block.
- The entire block is rested during monsoons for replenishment.
- The mining shall be confined to well within the riverbed corridor.
- No mining near the banks up to 1/10th of its width can be undertaken as per guidelines, i.e. 8 to 12 metres, from banks.
- Mining shall be undertaken to a depth of one metre only.
- The contract area is and shall remain riverbed.
- Thus, the topography or land use of the Riverbed *per se* will not be changed.
- The mining contract area is devoid of any vegetation.

- The land use of the mining contract area is defined in the Revenue record as 'Gair mumkin Darya'.
- The land under active mining would always remain riverbed, during as well as post mining.

2.2 EFFECT ON FLORA & FAUNA

✔ **Nil**

- Mining activity is restricted to very small area, which is not going to affect the flora and fauna of the area.
- No effect on fauna and flora is anticipated

2.3 EFFECT ON CLIMATE

- The mining contract area is very small, only 1.5452 hectares.
- The mining will be confined to, within the riverbanks.
- The mining will be confine to top one metre.
- Some micro level impact near the freshly exposed surface may happen for short duration as some humid material may be exposed
- The impact will need no mitigating measures.

2.4 IMPACT ON AIR

- No blasting is involved
- The major contributors of air pollution in open cast mining are excavation, loading and transportation, generating dust, which leads to momentary rise in the suspended particulate matter (SPM).
- Very little dust will be generated during transportation.
- This activity would generate negligible disturbance to air quality

2.5 NOISE POLLUTION

IMPACT

- The mining area represents calm surroundings.
- The mining shall be manual causing hardly any noise.
- The noise would be generated by the movement of trucks / tractor trolleys engaged in the transportation of the mined material.
- About 13 trucks trips would be required for transporting mined material per working day from mining area to crusher.

MITIGATION MEASURES

- The dedicated tipper truck would properly and regularly undergo maintenance to minimize noise.
- Special care would be taken to properly maintain the silencers of the vehicles.
- No use of horn shall be allowed in or near the mining area.
- There is already vegetation along the banks which fall outside the contracted area.

2.6 SOIL COVER

- The mining will be confine to Riverbed.
- It has no soil cover as the area gets frequently flooded during heavy rains.

- Thus, there shall be no impact on any natural soil cover.

2.7 EFFECT ON HYDROLOGY

- The mining area is part of riverbed.
- The mining will be confine to top one metre of riverbed.
- The mining will be confine to central part of riverbed, away from banks.
- Thus, mining would be dredging the dry riverbed and reducing the silt burden downstream.
- The mining will be undertaken during dry seasons.
- The ground water (undercurrent of the river) will not be disturbed

2.8 WASTE DISPOSAL MANAGEMENT

The area is in a regular course of Satluj River and no waste will be produced during the mining activity.

2.9 SOCIO- ECONOMIC IMPACT

- No adverse impact on the socio-economic condition of the area is envisaged.
- The induction of mining sector development in and around predominantly agricultural area is bound to create its impact on the socio-economic life of the local inhabitants. However, the mining project in the area will have various positive impacts in the area. The mining project and *its downstream* project construction activity will provide work to as many as 20 persons. Considered their total minimum earning per day to a tune of Rs. 8000 (@Rs 400/= per person per day), the area will get a supplementation in its financial and social wellbeing to some effect.

2.10 TRANSPORT OF MINERAL

The mining contract area is part of Son Khad. From the quarry site to the riverbank Rural road a track can be maintained. The mine road leads to rural road connecting the area to Dharmpur town, as shown in figure 3. In all about 118 tonnes of material will be evacuated daily during the working season of 270 days. From rural road, material can be transported to various places.

PART III

1 PROGRESSIVE MINE CLOSURE PLAN/RECLAMATION PLAN

1.1 Reclamation

- The mined area being part of the river course cannot be reclaimed for any other purpose.
- The land under active mining would always remain riverbed, during as well as post mining.
- However, mid-stream mining in accordance with approved mining plan would lead to systematic channelization of riverbed and minimize chance of boulders overflowing the banks. This would protect the adjoining area from fury of monsoon floods.

1.2 MINE WASTE DISPOSAL:

a) Year wise generation of mine waste and soil cover.

As explained earlier the following category of the waste is generated during riverbed mining.

- Silt/ Clay Mixture

The silt and clay are generally being inseparable from sand and sold along with it.

As such no waste will be generated during the mining of stone, sand and bajri.

1.3 The arrangements made for topsoil utilization, if any

As the mining area is part of riverbed, having no topsoil cover therefore, no topsoil is required to be removed, disturbed or disposed of.

1.4. Preventive Check dams

Considering the condition of riverbanks, no check walls are required to be constructed.

1.5 Plantation work

As far as the order of Apex court in writ petition(s)No(s) 114/2014 titled as Common Cause Vs Union of India & others is concerned, the riverbed which suffer frequent foods during monsoon period and where no grass growth is possible, as such mining area cannot be re-grassed subsequent to termination of mining operation. There is very little space outside/above the HFL, within the contract area, where no mining operations can be undertaken and as such is suitable for plantation. About five trees will be planted in the first year. Thereafter, no suitable space for tree plantation is available within the

auctioned block.

2 STRATEGY FOR PROTECTION OF POINT OF PUBLIC UTILITY etc.

There is no point of utility within radius of 200 metres of the mining contract periphery, which may need any kind of protection.

3 MANPOWER DEVELOPMENT

The mining activity will be mainly manual. Worker are mainly required in riverbed mining for extraction and loading of riverbed material into tipper truck and tractor trolleys. Drivers for tippers and tractors will be another category of workers. Thus, employment potential is as given below:

Munshi	1
Drivers	2
Unskilled workers	17

Thus total generation of Employment will be to a tune of 20 both skilled and unskilled workers.

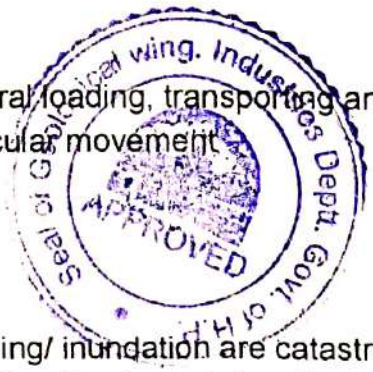
4 USE OF MINERAL

The stone, sand and Bajri are used as raw material in the construction and infrastructure industry. Thus, these minor minerals will be marketed directly to the consumers

5 DISASTER MANAGEMENT & RISK ASSESSMENT:

The mining contract area part of Riverbed which is prone to some risk hazards but there will not be any major risk hazard associated with the process. The possible scenarios selected for this project are as below:

- Inundation / Flooding
- Drowning
- Accident during mineral loading, transporting and dumping
- Accident due to vehicular movement
- Earthquakes



Inundation/Flooding

The consequences of flooding/ inundation are catastrophic or fatal. The likelihood of occurrence of flooding is occasionally possible. As per mining plan the mining work will not be carried out during monsoon season. The likelihood of occurrence of drowning is rare due to dry season mining.

Accident during mineral loading, transporting and dumping

The consequences of this scenario are minor which may be taken care with first aid care.

Accident due to vehicular movement

The consequences of this scenario are moderate and may result in hospitalization and day loss. The likelihood of occurrence is occasionally possible.

Earthquakes

The area falls in seismic zone IV. The mining operations are open cast pit mining. The mining pits will be only of one metre depth. There won't be any structure in the area likely to cause risk to worker. The workers rest sheds, store building and toilets will be constructed of lightweight wood and tin sheets.

6. RECOMMENDATION FOR RISK REDUCTION

Measures to prevent Inundation/Flooding/drowning

- Being on riverbed there should not be any mining operation during monsoon or rainy day
- Formation of deep pits should not be allowed
- Whenever there is any alert of flooding the workers will be moved to safer area along the banks.

Measures to Prevent Accidents during Loading

- The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
- The loading should be done from one side of the truck only.
- The workers should be provided with gloves and safety shoes during loading.
- Opening of the side covers would be done carefully and with warning to prevent injury to the loaders.
- Operations during daylight only.

Measures to Prevent Accidents during Transportation

- Vehicles will be periodically checked and maintained in good condition.
- Overloading will not be permitted;
- To avoid danger of accident roads and ramp near embankment should be properly maintained.
- The truck would be covered and maintained to prevent any spillage;
- The maximum permissible speed limit should be ensured;
- The truck drivers with proper driving license would only be employed.

Measures to Prevent Accidents during Earthquakes

- Occasional drills to create awareness for safety measures during mining operations and specially the measures to be adopted during earthquakes etc will be undertaken in consultation with experts.

Declaration

This is to declare that the Mining Plan of Minor Mineral auction block of Son Khad VI, for Stone, bajri and sand situated in Khasra No. 02/2, measuring 1.5452 Hectares, Mauza/Mohal Sarshkan, Tehsil Dharampur & District Mandi, has been prepared with our consent and approval and that we will abide by all commitments there under.

The 'Mining Plan and Progressive Mine Closure Plan' complies all statutory rules, regulation, orders made by competent authorities of State or Central Government or orders passed by courts have been taken into consideration and wherever specific permissions are required, shall be obtained.

We undertake to implement all measures proposed in the 'Mining Plan and Progressive Mine Closure Plan' in time bound manner.

We have deposited a sum of Rs..... with the competent authority of the State Government in form of fixed deposit Receipt as financial assurance of the same.

In case of default on our part, the approval of Mining Plan may be withdrawn, and aforesaid sum assured may be forfeited

Date
Place

Suresh Kumar,
Village Bharouri,
P.O. & Tehsil Dharampur,
District Mandi,
Himachal Pradesh

Certificate

Certified that the provisions of the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules 2015, Metalliferous Mines Regulation 1961 and other guidelines issued in this regard, from time to time, have been complied for, in the preparation of Mining Plan , of Minor Minerals auctioned block of Son Khad Part VII, for Stone, sand & bajri, situated in Khasra No. 02/2, measuring 1.5452 Hectares,, Mauza / Mohal Sarshkan, Tehsil Dharampur & District Mandi, of Shri Suresh Kumar, Village Bharouri, Post Office & Tahsil Dharampur & District Mandi, Himachal Pradesh.

- While preparing the 'Mining Pan' including progressive mine closure plan all statutory Rules, Regulations, Orders made by competent authorities of State or Central Government or orders passed by Courts have been taken in consideration.
- The information provided and data furnished in this 'Mining Plan' is correct to the best of my knowledge.

Date
Place: Shimla

SUBHASH SHARMA
No.HP/RPQ/01/1/2004

Seal of Geological wing. Industries Dept. Govt. of