MINING PLAN

MINOR MINERAL
AUCTION CONTRACT
FOR
SAND, STONE AND BAJRI,
KHASRA NO. 100,
MEASURING 8.1683 HACTARES,
FALLING IN MAUZA JHARERI,
TEHSIL JHANDUTTA, DISTRICT BILASPUR,
LETTER OF INTENT
GRANTED IN FAVOUR OF
SHRI SHYAM KUMAR,
VILLAGE TIKKERI, P O PANJGAIN,
TEHSIL & DISTRICT BILASPUR.

2018

Geological Wing, Industries Dept. Govt. of H.P.
APPROVED

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APPROVED
With Condition
शर्तों के साथ अनुमोदित
Vide Letter No. Udyog-Bhu(Khani-4)Laghu-603/2018-9345
Dated/दिनांक 24/12/18

State Geologist,
Himachal Pradesh

Auction Quarry

MINING PLAN
OF PART OF SEER KHAD, MINOR MINERAL AUCTION CONTRACT FOR SAND, STONE AND BAJRI, SITUATED IN KHASRA No 100 MEASURING 08-16-83 HECTARES, FALLING IN MAUZA & MOHAL JHARERI, TAHSIL JHANDUTTA, DISTRICT BILASPUR GRANTED IN FAVOUR OF Shri SHYAM KUMAR, VILLAGE TIKKARI, P.O. PANJGAIN, TAHSIL SADAR, DISTRICT BILASPUR, HIMACHAL PRADESH

INTRODUCTION:

Shri Shyam Kumar son of Shri Sita Ram, Village Tikkari, Post Office Panjgain, Tahsil Sadar, District Bilaspur, Himachal Pradesh have been issued, consequent to their highest bid in auction of Jhareri-I quarry (Jhandutta) a 'Letter of Intent' for grant of mining contract vide letter No. Udyog-Bhu(Khani-4) Laghu- 603/2018/794 dated 23-04-2018.

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 contractors must submit 'Mining Plan' of the area for a period of five years. Therefore, contractors, requested for the preparation of Mining Plan of the area.

Accordingly, this 'Mining Plan' is prepared in accordance with the 'FORM 'M' annexed with the said Rules.

The auctioned block is a part of perennial Seer Khad, and situated at about 24 kilometres from Bilaspur, district HQ and about 12 Km. from Ghumarwain.

1. General

1.1 Name and address of the applicant

1.1. A. Name of the applicant–

Sh. Shyam kumar, S/o Sh. Sita ram

1.1. B. Address of the applicants –

Village: Tikkari
Post Office: Panjgain,
Tehsil: Sadar

District: Bilaspur.

1.2 Status of the applicant

The applicant contractor is the 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, bajri and sand. 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 Auctioneds are granted and further renewed.

Fifteen years.

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

Subhash Sharma
Flat No. 207, Basant Vihar
Kasumpti, Shimla: -171009.
Registration No. HP/RQP/01/1/2004
Mobile No. 09816029594

1.6. Name and address of the prospecting agency

Detailed survey and exploration for this 'Mining Plan' was undertaken by the RQPs. Secondary data for this report was collected from concerned departments such as Department of Agriculture etc.

2. Location and Approach of the area

Survey of India Topo-sheet No. H43E11
Scale; 1:50000
Surveyed in 1983-84; updated in 2005-06;
First Edition 2010.

Auction Quarry

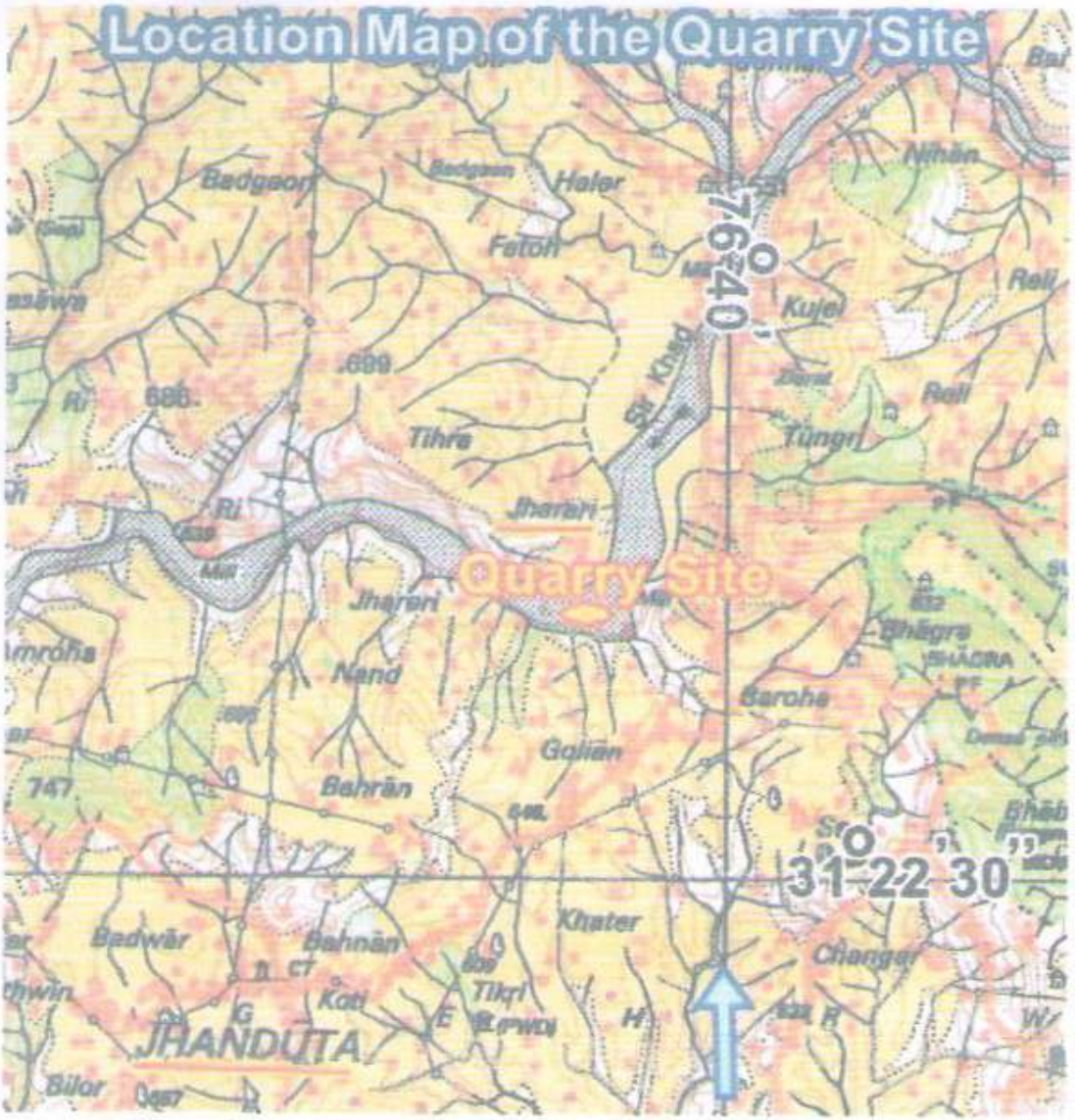


Figure 1: Location map of the area.

The area lies between the latitude and longitude given below in table 1 and shown in the figures 1 & 2.

Table 1: Showing latitude and longitude bounding the area.

Latitude	Longitude
N 31° 23' 12.3" N	E 76° 39' 22.8"
N 31° 23' 10.3" N	E 76° 39' 31.8"

Figure 2: Showing latitude and longitude of the Auction area.

2.2 a Details of area: The detail of the area is given below in table 2.

Table 2:- **Revenue Details of Auctioned Area.**

Khasra no.	Area(Hectares)	Status	Owner of Land	Kism	Mauza & Mohal
100	8.1683	Government land	State Government	Gair Mumkin Khad	Jhareri

	Village: -	Jhareri
	Patwar circle: -	Jhareri
	Post Office: -	Jhareri
	Tehsil: -	Jhandutta
	District: -	Bilaspur
2.3	Sub Divisional Office (Civil): -	Bilaspur
	Divisional Office (Forest): -	Bilaspur
	Sub Divisional Office (IPH): -	Jhandutta
	Sub Divisional Office (PWD): -	Jhandutta
	State :	Himachal Pradesh

2.4 Distances from Important Places:
The important distances, from the Auctioned area are given below in table 3.

Table 3: Showing important distances from the area

	Place	Distance
1	Jhandutta (Tehsil Office) • Road	 5 Km
2	Bilaspur (District Headquarter) • Road	 25 Km
4	Shimla (State Capital), • Road (NH 103) • Narrow gauge Railway • Airport	 110 Km 118 Km
	Ghumarwain • Road	 13 Km
6	Kiratpur • Road • Railway Station	 87 Km

2.5 Approach to the Quarry site

Figure 3: Approach to Quarry site.

The quarry site is about 1km from the road head. It is approachable from NH103 at Bhager at about distance of 13 Km. From the road, a Katcha track leads to the Mining Site as shown in figure 3.

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 north-western India in the states of Himachal Pradesh and Uttar Pradesh, in north-central India in the state of Sikkim, and in north-eastern India in the state of Arunachal Pradesh, range from 1,500 to 5,000 metress in height.

The relief of the District is given below in the figure 4.

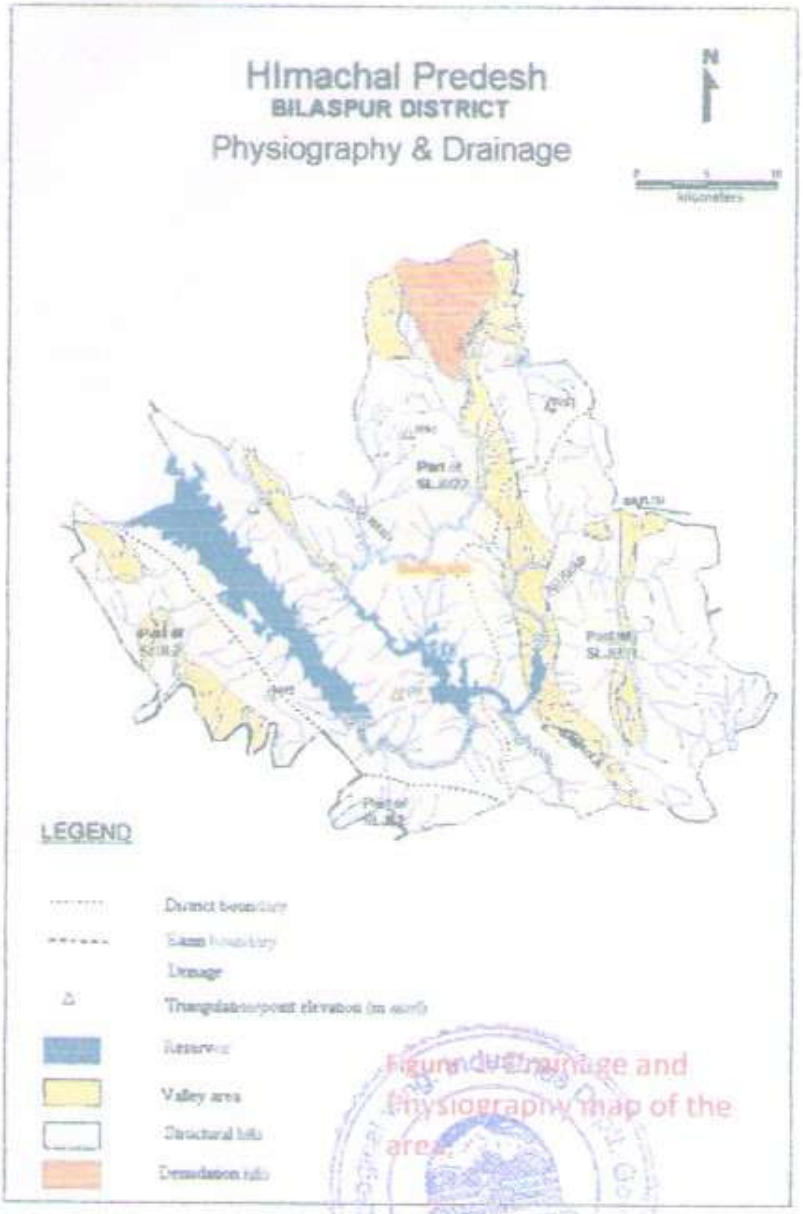


Figure 4: Drainage and Physiography map of the area

The mining area is a part of Seer Khad, relief of Seer khad is given in figure 5 below:

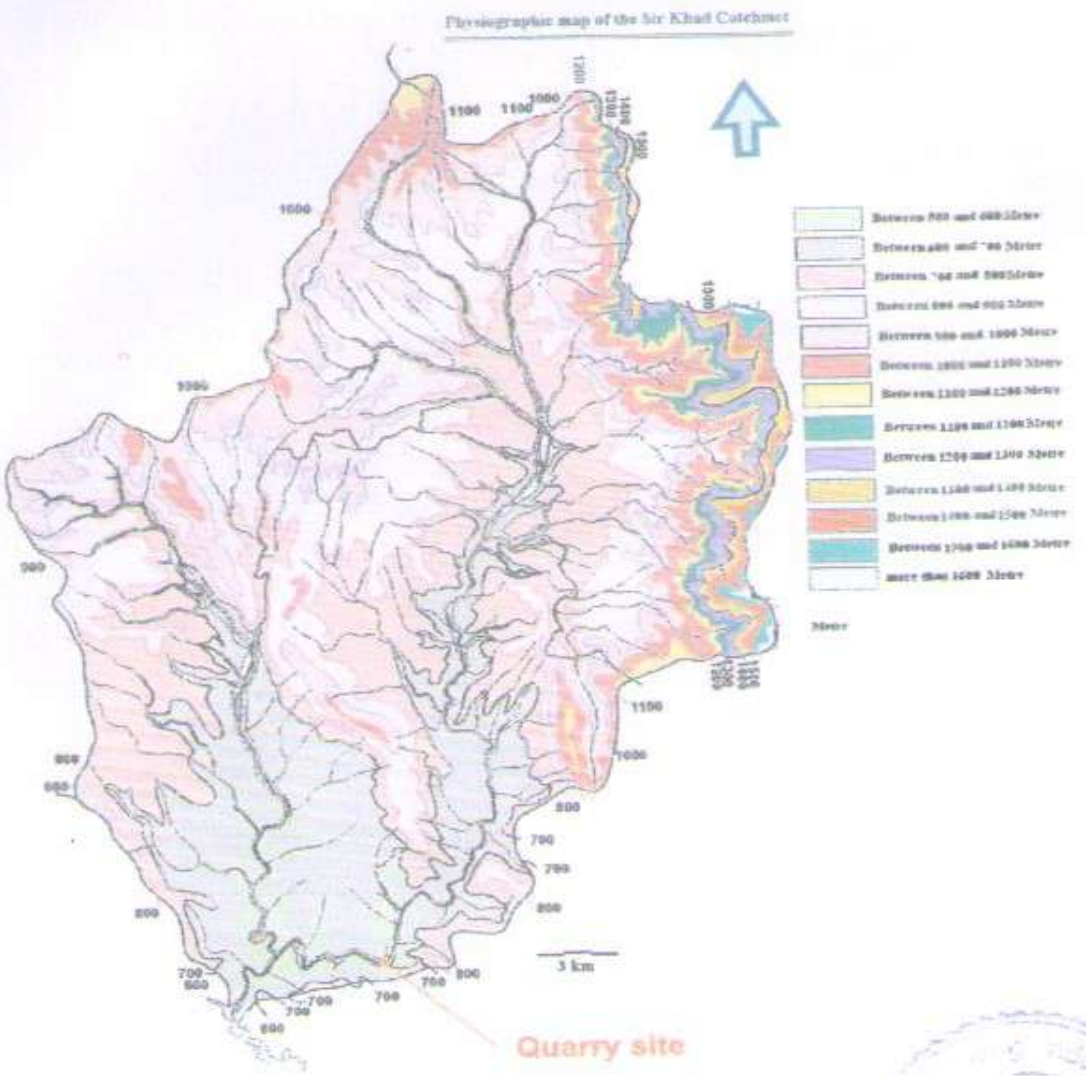


Figure 2: Physiography of Seer Khad (showing location of Quarry site)

The area is situated in the channel of Seer Khad, a tributary of River Satluj, can be divided into following three parts as per attitude

1. *High* *More than 800 metres above Mean Sea Level*
2. *Medium* *Between 600 metres and 900 metres above Mean Sea Level*
3. *Low* *Less than 600 metres above Mean Sea Level*

The area above 900 metres is the zone of active erosion and area between 900 and 800 metres is the zone of active erosion in the high flood time otherwise zone of deposition. The area below 800 metres is zone of active of deposition except for very high flood.

The area is situated at the confluence of Seer Khad and a small khad on its right bank.

3.2 Altitude of the area

- The height contour in the lease area in Seer Khad is at 540 metres above MSL (Map 2, Contour Map)
- The lowest contour in the lease area in the Seer Khad is at 530 metres above MSL (Map 2, Contour Map)

3.3 Climate of the Area

- The Climate of the area can be classified into following three categories Winter, Summer and Rainy
- The climatic information given below is based on the data obtained from the Revenue Department of Himachal Pradesh given in the table 4 below.

Table 4:

Dec. – March	Winter
April- May	Summer/Pre-monsoon
June- September	Monsoon
October- November	Post Monsoon/ Autumn

Mean monthly maximum and minimum temperature recorded at Sundernagar is given in the figure 6

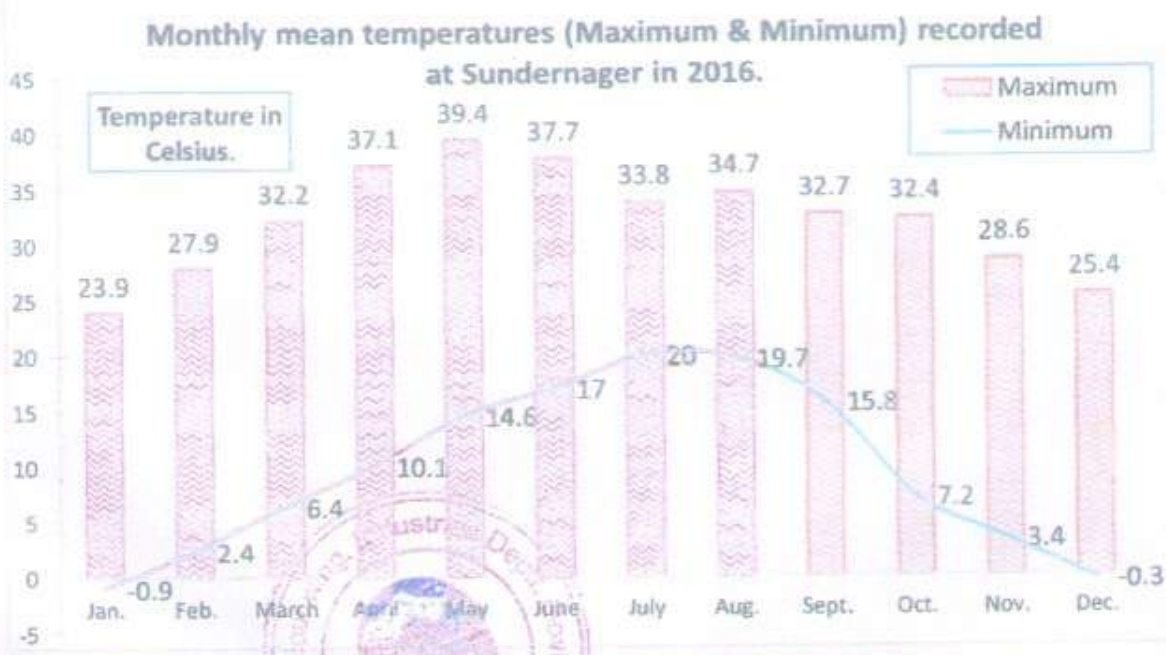


Figure 3 Chart Showing Month wise Mean Maximum Temp (MMAX), Mean Minimum Temp (MMIN) in Centigrade of Bilaspur

3.4 Annual Rainfall :

The annual rainfall of Bilaspur district during last Eleven Years is given below in the figure 7.

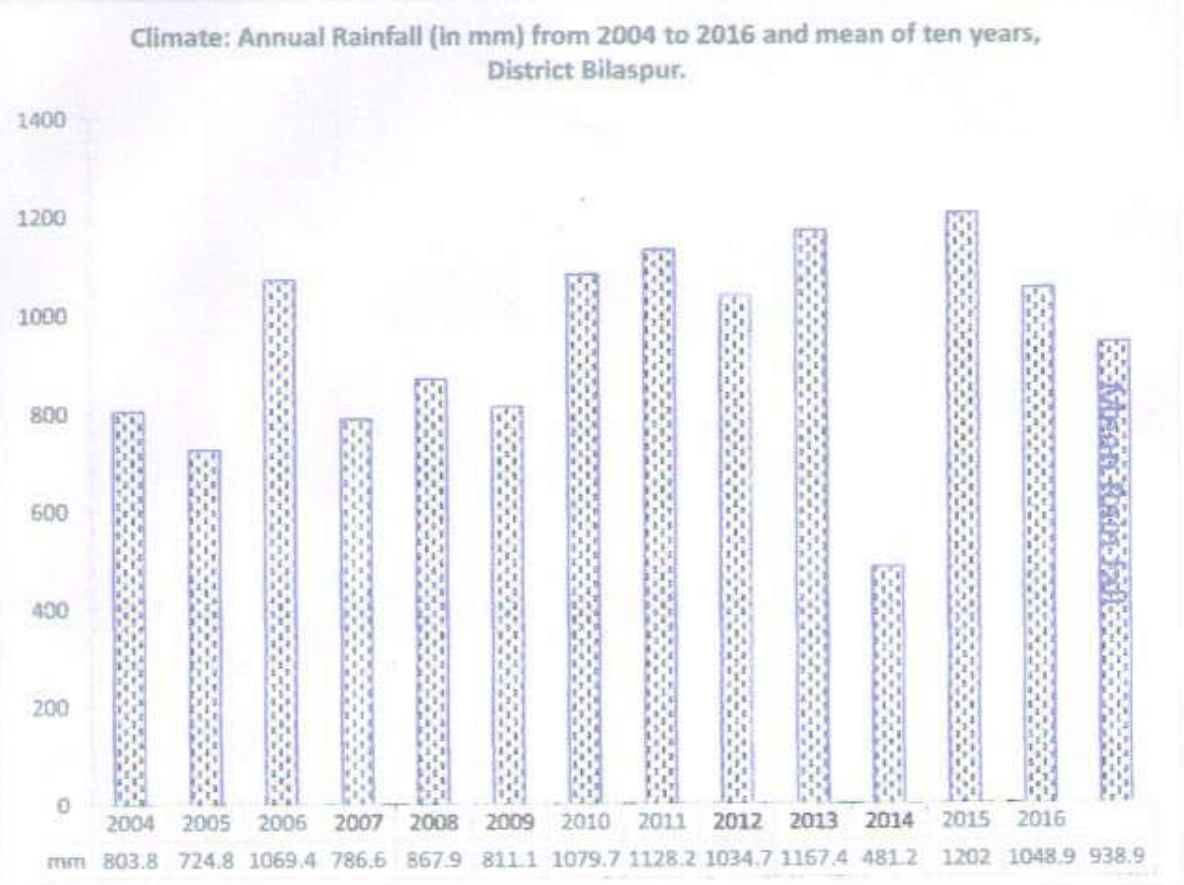


Figure 4: Showing annual rainfall of Bilaspur district from Year 2004 to Year 2013.

3.5 Any important feature

- The Seer khad catchment area is a rugged mountainous terrain with steep slopes and narrow and deep valleys.

PART I

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

1.1. General

The area is situated in the Seer Khad, a primary tributary of the of the Govindsagar (Satluj River System). Seer Khad stream starts from District Mandi at Wah Devi of Himachal Pradesh. After draining kot-ki-Dhar and greater portion of Ghumarwain tahsil of Bilaspur, it joins Satluj river at village Serimatla.

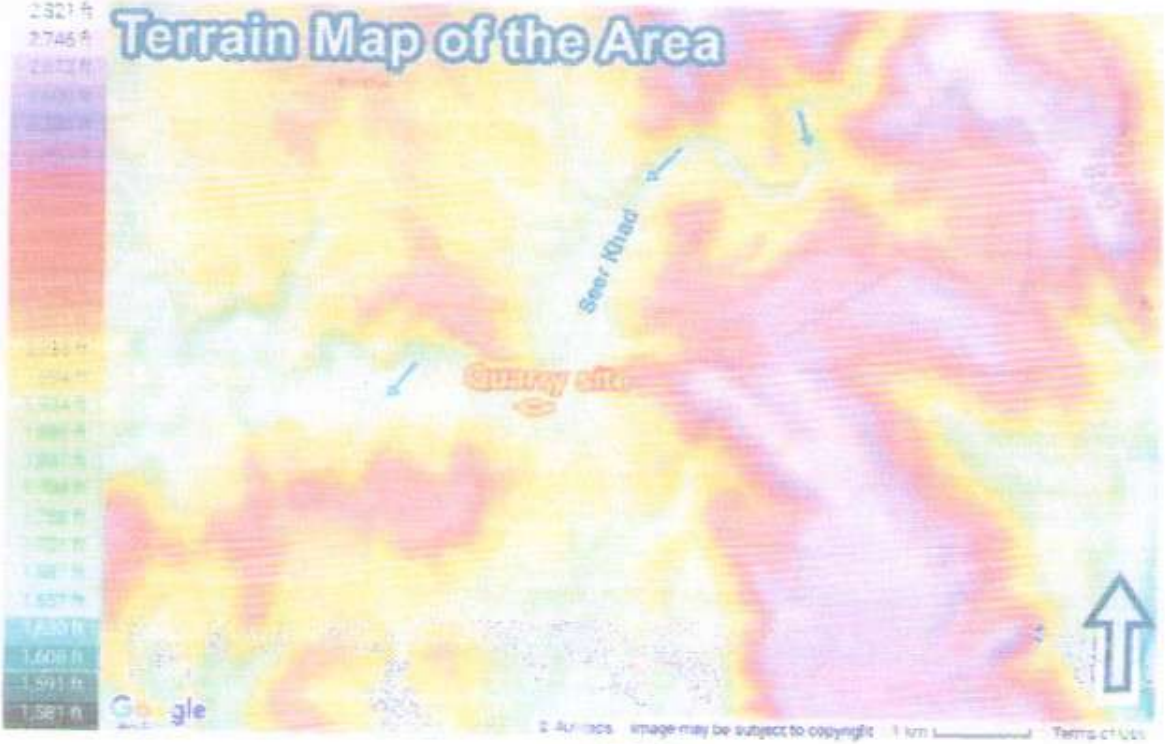


Figure 5: Terrain map of the area

1.2 Name of River/ Stream in which the Auctioned area is situated

The Auctioned is situated in the river bed of Seer Khad Khad.

1.3 Drainage System

Satluj

1.4 Type of Drainage

Dendritic

1.5 Origin of River/Stream

The Seer khad originates at Wah Devi (10km from Sarkaghat) at an altitude of 1384 metres above MSL (in Mandi District) enters in Hamirpur district at Bhukhar (800Mts above MSL) and follows the boundary of Hamirpur on right bank and Mandi on left bank.

1.6 Altitude at Origin

1384 meter above mean sea level.

1.7Geometry of the catchment of the river

General Geometry of Seer Khad is

- The total length is about 58
- Perimeter of the Catchments is 124 Km
- Area of the catchments approximately 456 Sq Km

General gradient is given below in the figure 9

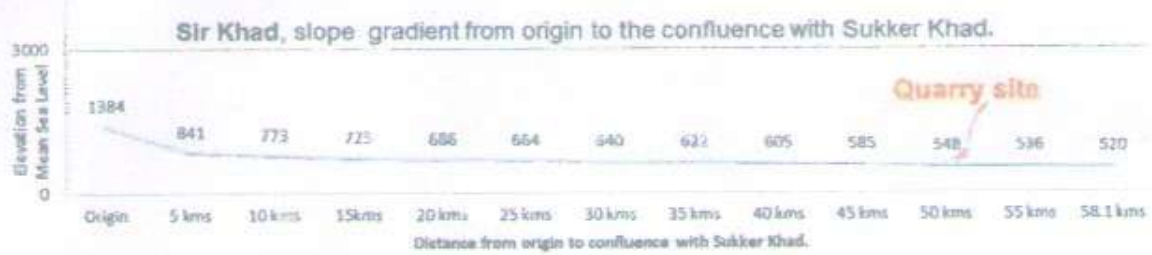


Figure 6: General Slope of Seer Khad from Origin to Confluence with Sukker Khad

From various analysis of the drainage the Seer Khad can be divided into three parts

- From origin to the 900 meter above mean sea level
  The zone of active erosion—Young stage
- From 900 to meter contour to 800-meter contour with Seer Khad
  The zone of erosion during normal floods; otherwise zone deposition – Maturity stage
- From 800 meters to the confluence with Seer Khad
  The zone of erosion during very high floods; otherwise deposition – Maturity stage

However, the Catchment Geometry of effective catchment up to the Mining Auctioned area is

- The total length up to Auctioned area. is about 10 kms
- Perimeter of the Catchments is 32 Km
- Area of the catchments approximately 68 Sq Km

The mining area falls in zone of maturity and receives abundant amount of replenishment during monsoons.

1.8 Width of River at the place of Mining

The width of the Khad at the place of Mining varies from 740 metres to 760 metres in area.

1.9 The annual deposition at the place of mining:

Six Cm in the Auctioned-out area depending upon the location. At some places, it may be more than the 8 Cm.

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

The general competency at the mining area is four to six Kg approx. The largest boulders vary 12 to 24 cm X 12 to 30 cm X 9 to 18 cm (length X breath X height) (Photo -1)

Photo 1: Showing competency of Seer Khad near the mining Auctioned area.

1.11 The level of HFL

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

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). Bilaspur District lying within the Lesser Himalaya and the Shiwalik Foothill comprises rocks ranging in age from Proterozoic to Quarternary. The oldest rocks are of undifferentiated Proterozoic age, comprising canrbonaceous phyllite, schist, gneiss, quartzite and marble. The GhogharDhar (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 Sundernagar 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.

2.2 Local Geology

Bilaspur district nestles between siwalik ranges and forms part of the lesser Himalayas. The rock formations occupying the district range in age from Pre-Cambrian to Quaternary period. The generalised geological sequence of the area is given in the figure 10 and stratigraphy of the area is given in the table 5.

Table 5 Stratigraphy of the Area

S. 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

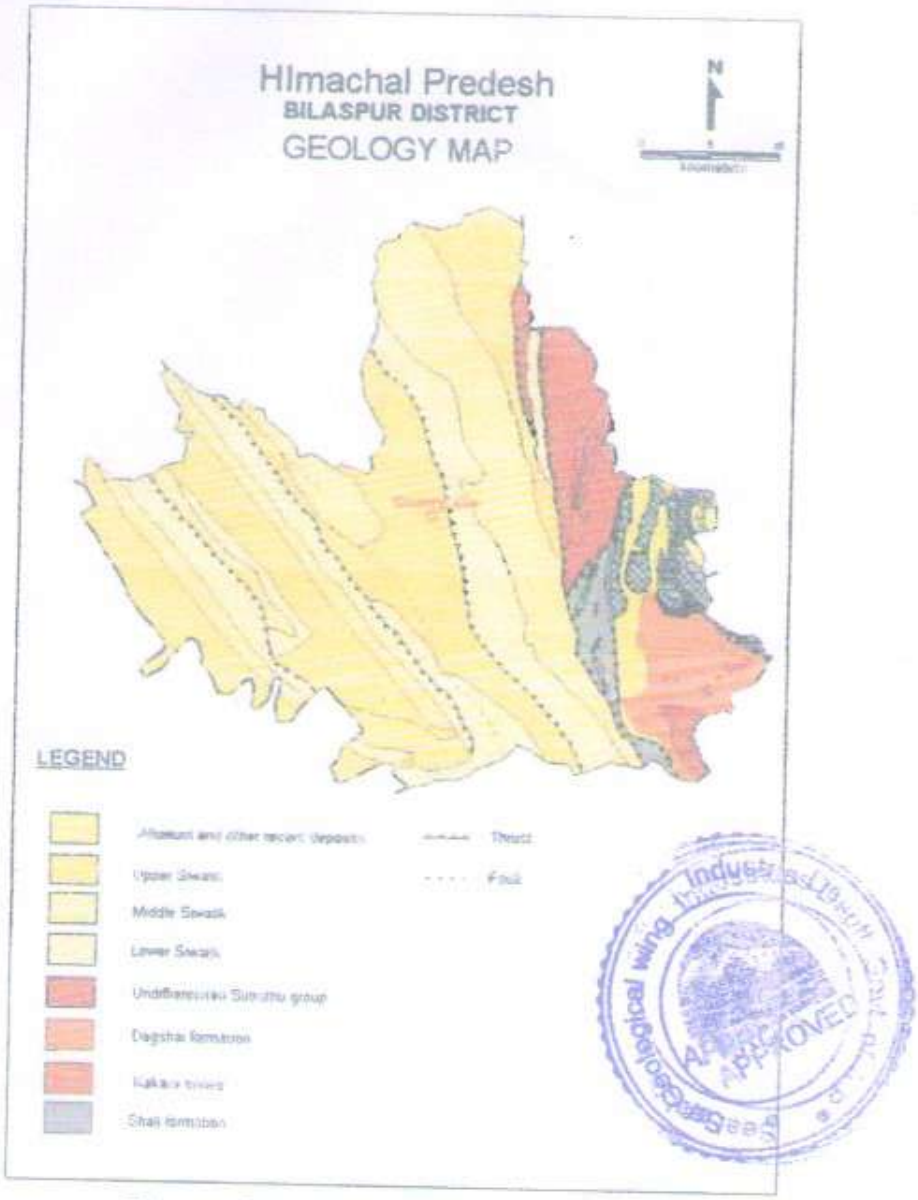


Figure 7: Geological map of district Bilaspur

2.3 Geology of the Auctioned area

The Auctioned-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 Seer 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 Seer 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.

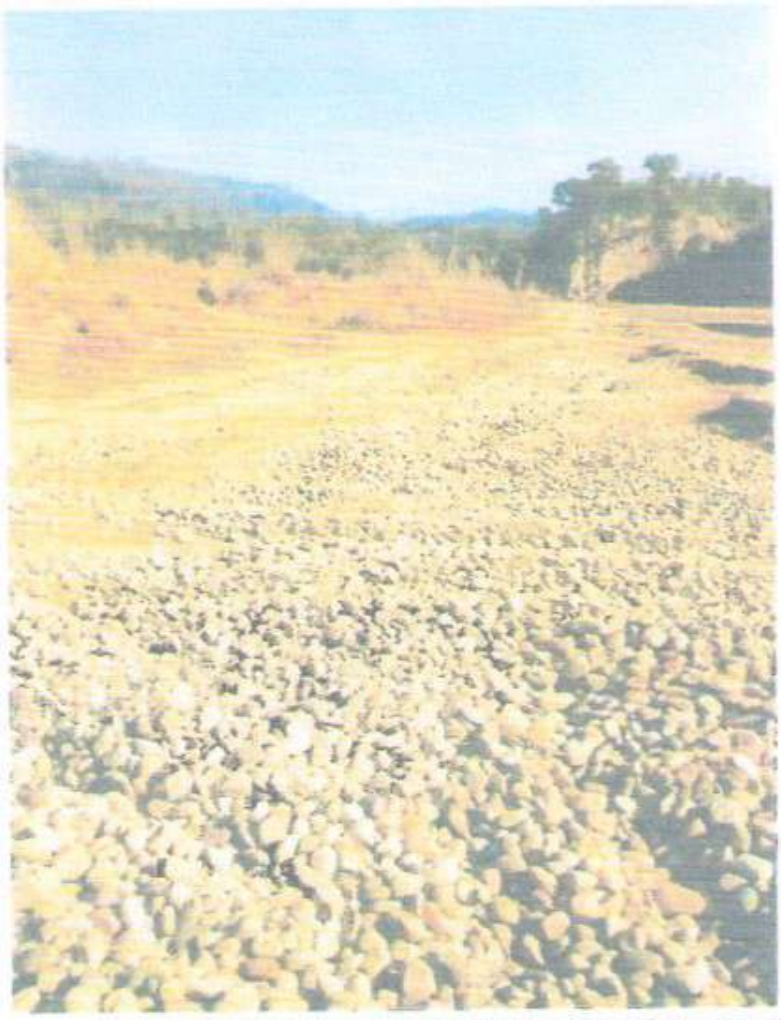


Photo 2; Showing the nature of the Boulders of the Seer Khads

2.5 The Nature of the rock along the bank

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

Photo 3: Nature of Banks.

2.6 Annual Deposition

The area being part of the SatlujRiver Catchment which receives heavy annual rainfall during monsoons, 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 six 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 three 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.*

Photo 4: Part of auctioned area.

The catchment area generally is formed of Shiwalik and tertiary formation and will contribute eroded material during monsoons to replenish the mined material.

3 Reserve Estimate

3.0 General Consideration

The basic requirement of the lessee will be boulders, stone, sand and Bajri for open sale. Hence the Contractors intend to mine stone, sand and bajri which preferably will be sold at pit mouth but per requirement of consumers may be sold at destination.

3.1Percentage wise distribution of Mineral:

The table below shows the percentage wise distribution of minerals and figure 11 depicts the pie chart for the same.

Table 6

S.No	Category	Percentage
1	Stone	38%
2	Gravel / Bajri	32%
3	Sand	30%

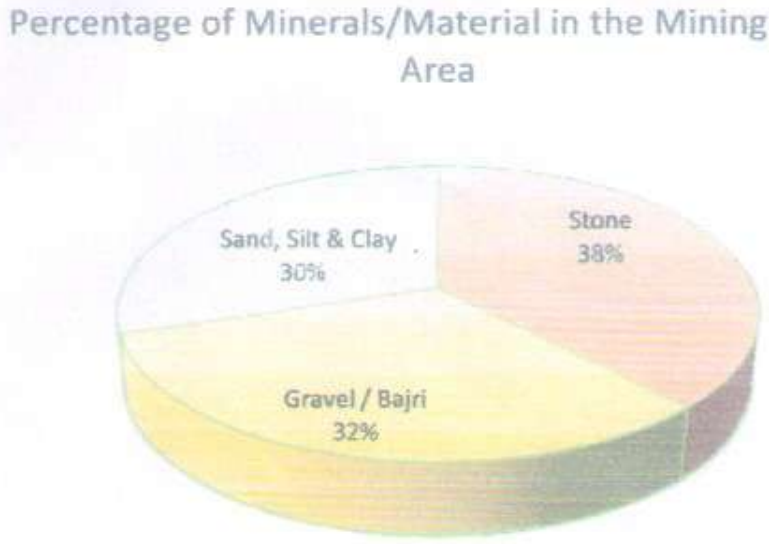


Figure 8: Percentage of each category of mineral present in the Auctioned-out area.

3.2 Estimate of Geological Reserve

3.3 Estimate of Mineable reserves of boulders, Bajri and Sand.

The basic requirement of the lessee will sand, stone and bajri. Hence, the applicants intend to mine sand, stone and bajri and it will be picked up by hand shovelling into tractor trolleys will be transported to the construction site 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 width (HFL to HFL) or 5 meters from the banks (HFL) of the river / River whichever is higher.
- ✓ The width of the River in Auctioned area is 100-200 meters; thus, no mining is proposed in the area up to 10 to 20 meters from the banks (HFL to HFL).
- ✓ The water table level will go down as the water recedes after the monsoons.
- ✓ The depth of water table will at lowest in the pre-monsoon season
- ✓ The workability is suggested by keeping in the mind possible effect on the meandering of River also. The mining on the concave bank is most suitable mining and convex bank is unsuitable. Hence year wise mining is suggested in a way that it will get replenish during next season.
- ✓ No mining is to be undertaken up along the boundary of the auction area if the mining is likely to cause any adverse impact on the adjoining land or the owners of the adjoining land has not given his consent for mining.
- ✓ 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.
- ✓ Adequate safety zone is provided for the safety of cremation shed on the left bank.

The total mineable area and deposit is shown in table 8 and figures 12.

- ***After providing safety belt around places of public utilities and for banks, only 78000 square metres of area is available for minin.***

Table8: Mineable reserves in the block

Square Metres		Volume Mined	Metric Tons			
Auctioned area	Mineable Area	Cubic Metres	Stone	Gravel / Bajri	Sand	Total
81683	78000	78000	66690	56160	52650	175500

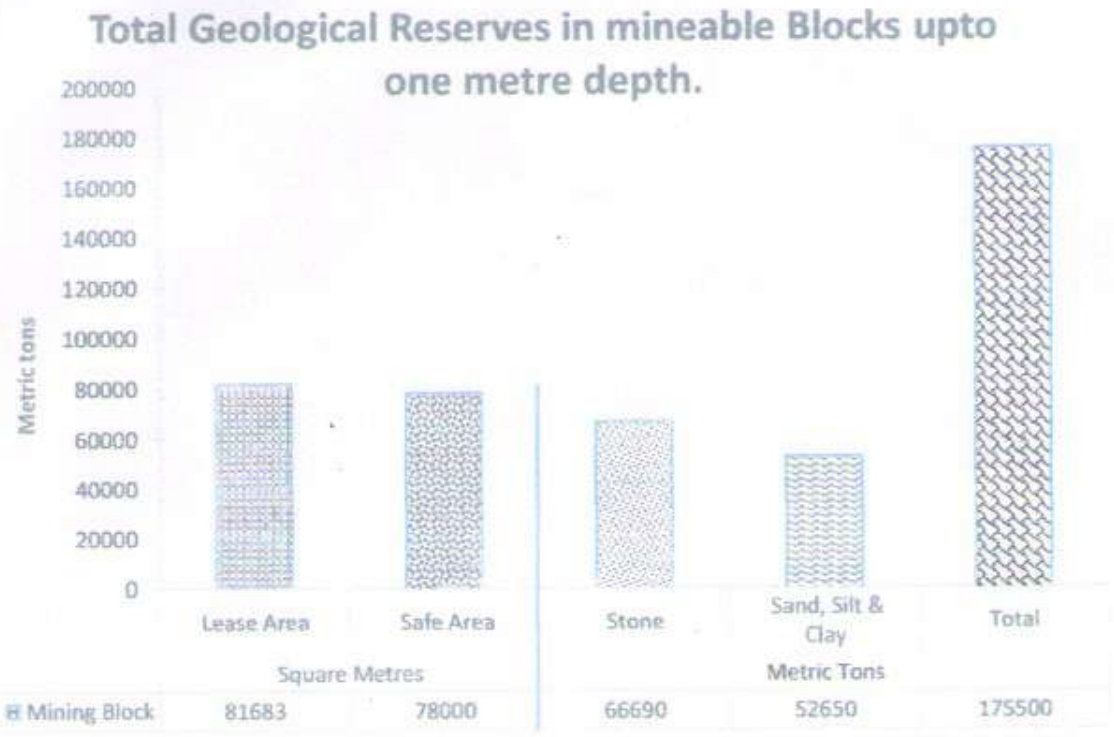


Figure 10: Mineable Reserve up to One Metre depth

Thus, the safe mine-able block of 78000 square metres contains 78000 cubic metres of mine able material up to a depth of one metre. The entire mine able block will be mined every year.

3.4 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'*.

The study of the area indicates that depth varying from zero meter to more than a meter for mining will be available in the auctioned area keeping in view various factors, such as:

Season- that is post- monsoon to pre-monsoon.
Nature river- It is seasonal at this place.
Distance from water flow.
Height above surface water level.
Width of river.
Age of river at mining site.

Thus, the calculation for mineable reserves become complex. In all it was computed based on local study that on an ***average entire mineable area can be mined is assumed for calculation purpose. Thus, during pre-monsoon period mining will be undertaken in the entire mineable block up to one metre depth.***

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

3.5 Estimate of Annual Deposition

The catchment area of Seer Khad is about 456 square metres and geologically is prone to erosion, since it is formed of fragile rock of tertiary and Shiwalik formations.

3.6. Specific Gravity

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

3.7. Reserves

The reserves of all the constituents of River bed have been calculated for the mine-able area to be 78000 cubic metres and considering the specific gravity as 2.25 as shown in para 3.6. The reserves have been calculated for next five years mining, of mine-able deposit up to maximum permissible quarry depth of one metre. 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 13 shows the proposed production of materials in five years.

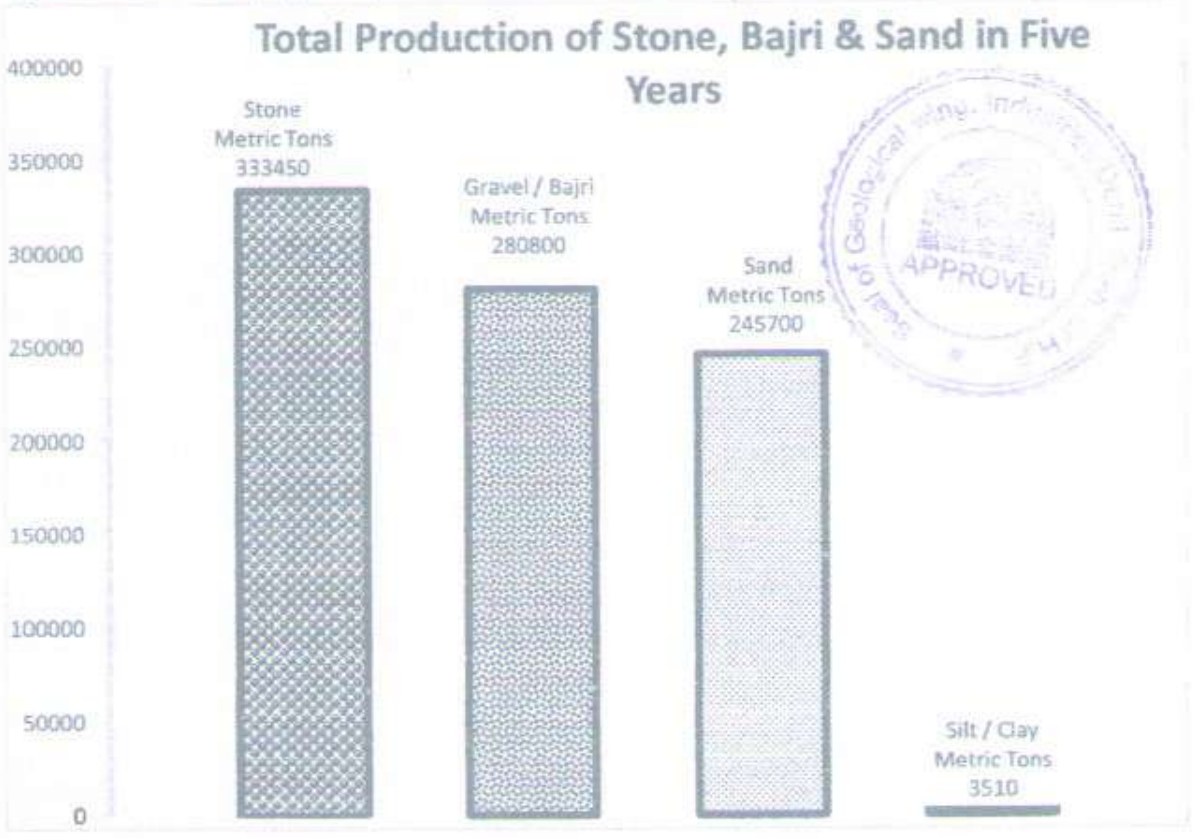


Figure 11: Proposed production of total material in five years

4 MINE DEVELOPMENT AND PLAN OF PROGRESSIVE MINING.

The mining / collection of minerals shall involve shovelling 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, stone and Bajri 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 t 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 14 and Table 9 show the production of Minerals in five years.

	First	Second	Third	Fourth	Fifth	Total
Stone	66690	66690	66690	66690	66690	333450
Gravel / Bajri	56160	56160	56160	56160	56160	280800
Sand, Silt & Clay	52650	52650	52650	52650	49140	259740
Total	175500	175500	175500	175500	171990	873990

Figure 12: Year wise Availability of Materials (in Metric tons).

4.2 Year wise Production

Figure 13 show the year wise mineable area.
The year wise mine working planned for the Quarry is presented in the map 3.

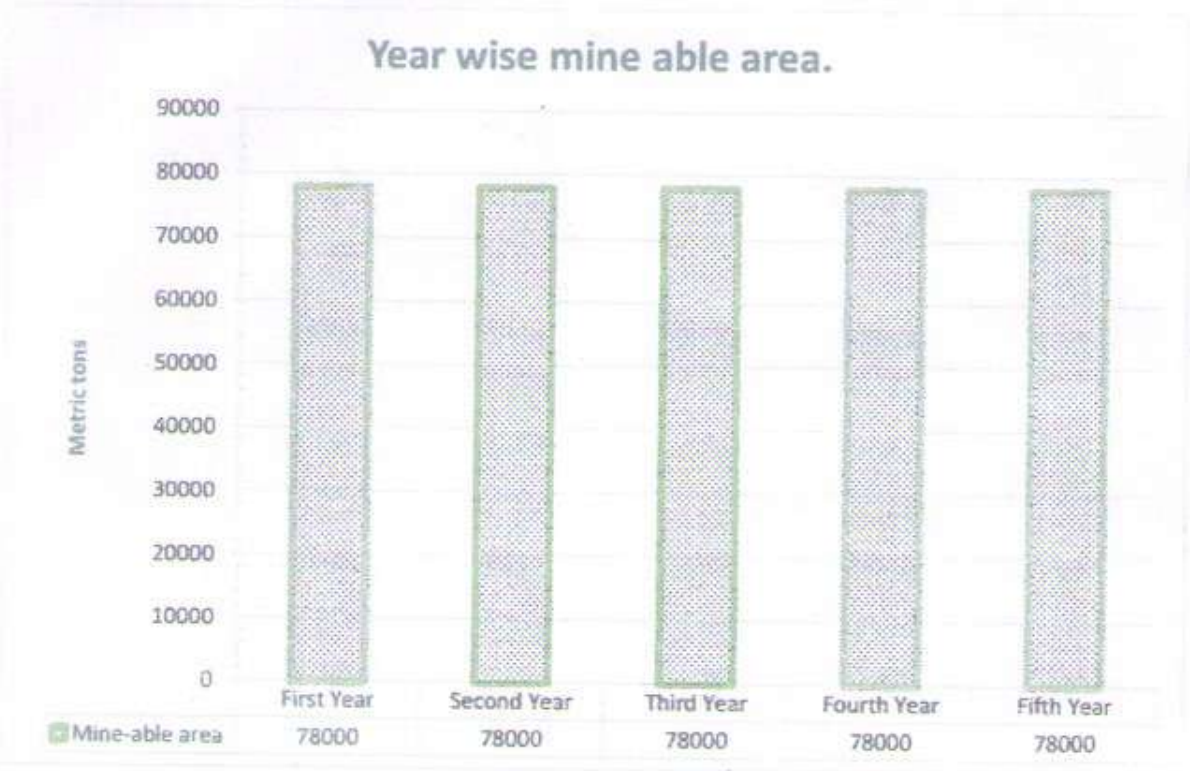


Figure 13: Showing year wise mine-able area

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

- Mining of 78000 cubic materials is proposed to be mined from 78000 square meter safe mining block.
- 66690 metric tons of stone and 56160 metric tons of bajri will be produced and sold in open market depending upon demand.
- 52650 metric tons of sand along with inseparable silt and clay will be produced and sold in open market depending upon demand.
- Some part of quarry area falls outside the banks of Seer Khad where plantation can be undertaken. During the year, it is proposed at area shown as P1.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-1.

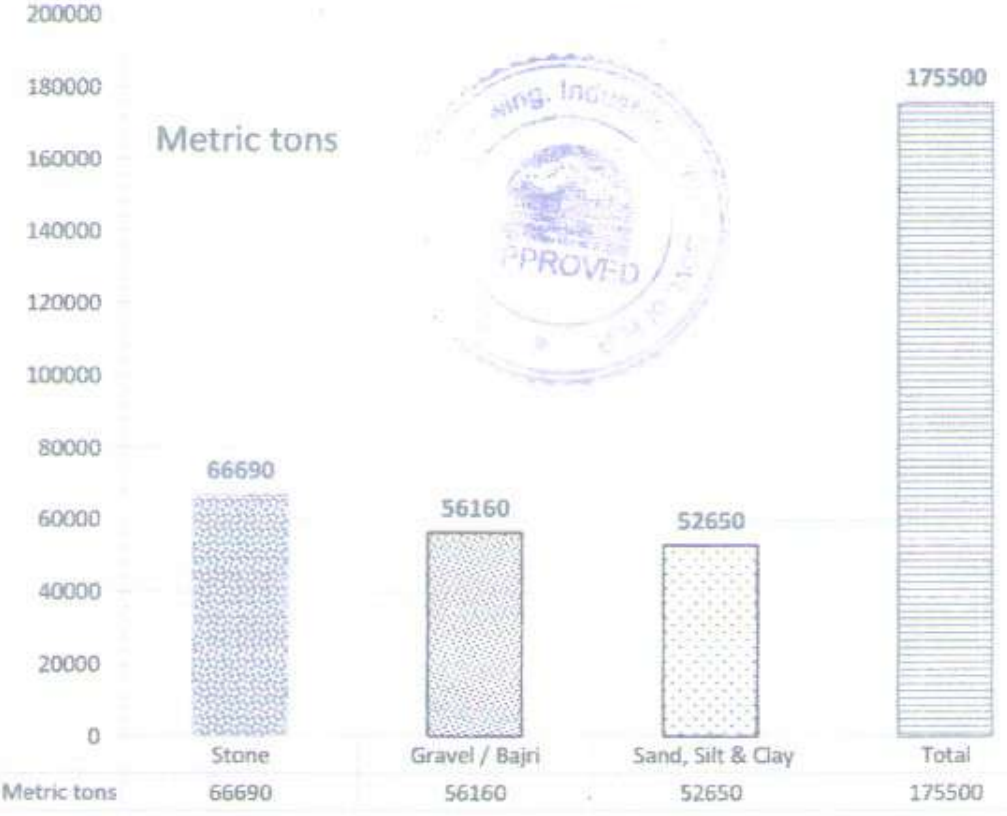
Figure 14: Proposed Production and Material Handling in the First Year of Mining.

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

During 2nd year of development and production programme:

- Mining of 78000 cubic materials is proposed to be mined from 78000 square meter safe mining block.
- 66690 metric tons of stone and 56160 metric tons of bajri will be produced and sold in open market depending upon demand.
- 52650 metric tons of sand along with inseparable silt and clay will be produced and sold in open market depending upon demand.
- Some part of quarry area falls outside the banks of Seer Khad where plantation can be undertaken. During the year, it is proposed at area shown as P2.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-2.

Projected Total Material Handling and Production of Mineral, in Metric tons during Second year.



	Stone	Gravel / Bajri	Sand, Silt & Clay	Total
Metric tons	66690	56160	52650	175500

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 78000 cubic materials is proposed to be mined from 78000 square meter safe mining block.
- 66690 metric tons of stone and 56160 metric tons of bajri will be produced and sold in open market depending upon demand.
- 52650 metric tons of sand along with inseparable silt and clay will be produced and sold in open market depending upon demand.
- Some part of quarry area falls outside the banks of Seer Khad where plantation can be undertaken. During the year, it is proposed at area shown as P3.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-3.

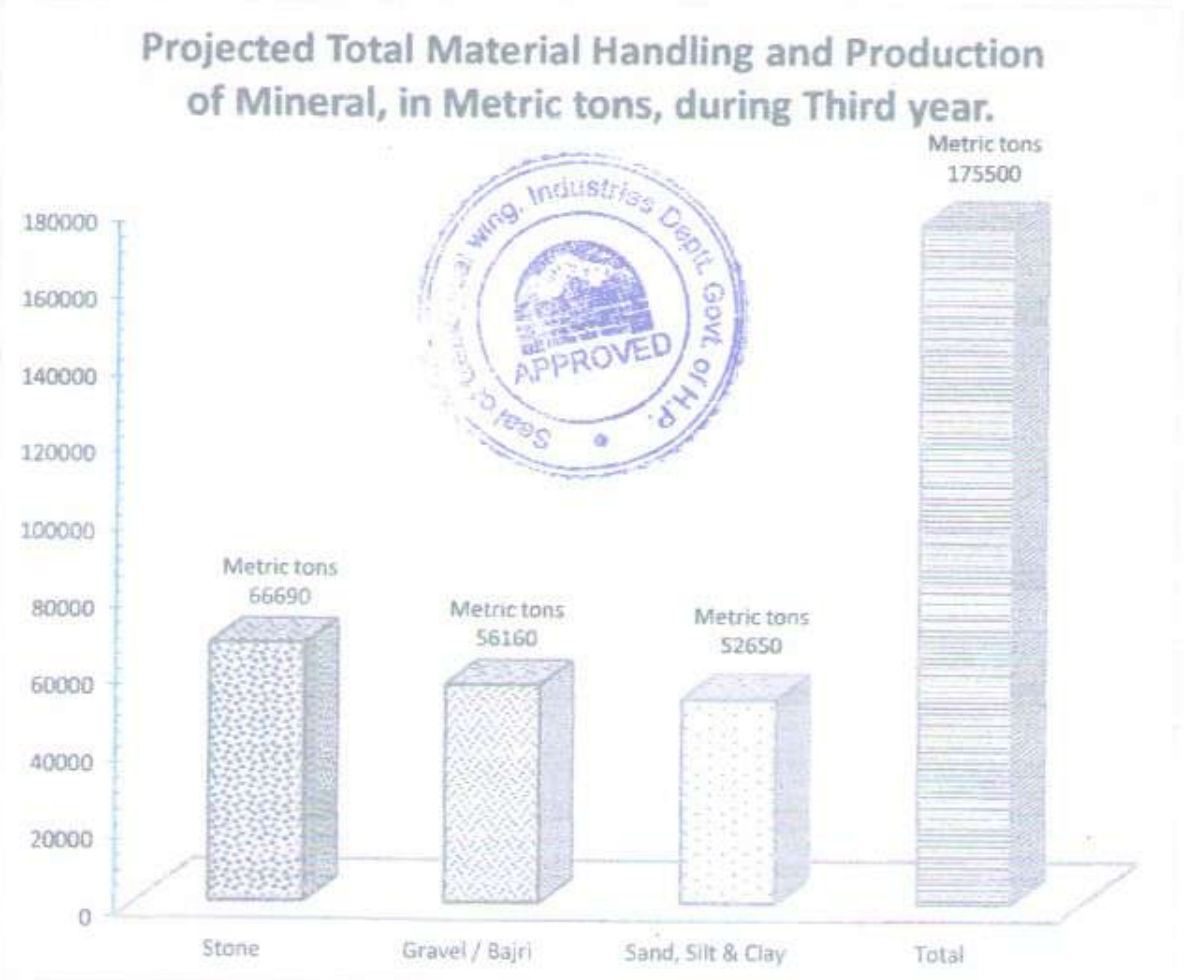


Figure 16: Proposed Production and Material Handling in the Third Year of Mining.

4.2 d Development and Production at end of fourth Year.

During 4th year of development and production programme:

- Mining of 78000 cubic materials is proposed to be mined from 78000 square meter safe mining block.
- 66690 metric tons of stone and 56160 metric tons of bajri will be produced and sold in open market depending upon demand.
- 52650 metric tons of sand along with inseparable silt and clay will be produced and sold in open market depending upon demand.
- Some part of quarry area falls outside the banks of Seer Khad where plantation can be undertaken. During the year, it is proposed at area shown as P1.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-4.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-4.

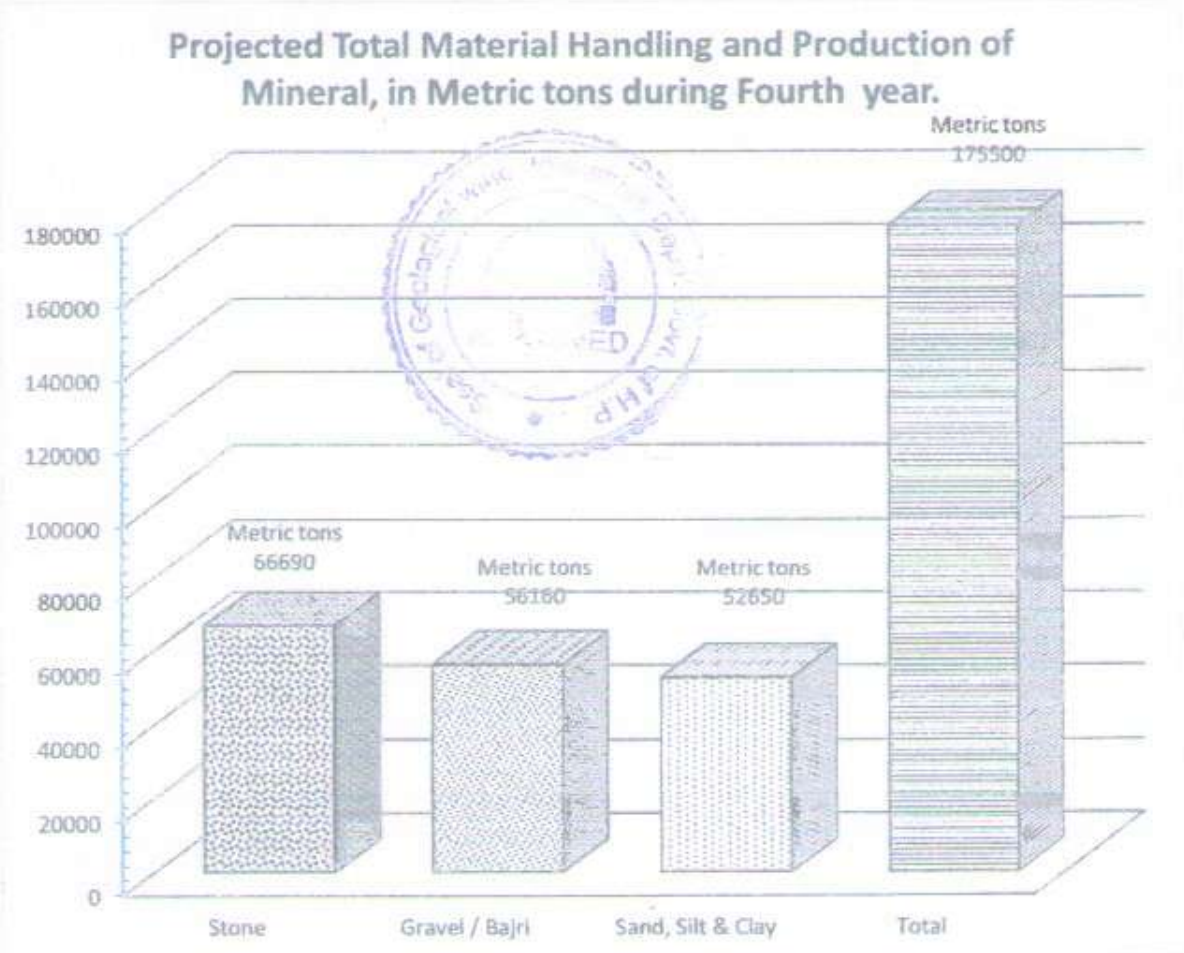


Figure 17: Proposed Production and Material Handling in the Fourth Year of Mining.

4.2 e Development and Production at end of fifth Year.

During 5th year of development and production programme:

- Mining of 78000 cubic materials is proposed to be mined from 78000 square meter safe mining block.
- 66690 metric tons of stone and 56160 metric tons of bajri will be produced and sold in open market depending upon demand.
- 52650 metric tons of sand along with inseparable silt and clay will be produced and sold in open market depending upon demand.
- Some part of quarry area falls outside the banks of Seer Khad where plantation can be undertaken. During the year, it is proposed at area shown as P5.
- Check dams are proposed in the part of Auctioned Area falling near the banks of Seer Khad shown as C-5.

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

4.3 End Use of Mineral

The extracted mineral stone, Bajri and sand along with silt will be sold in open market.

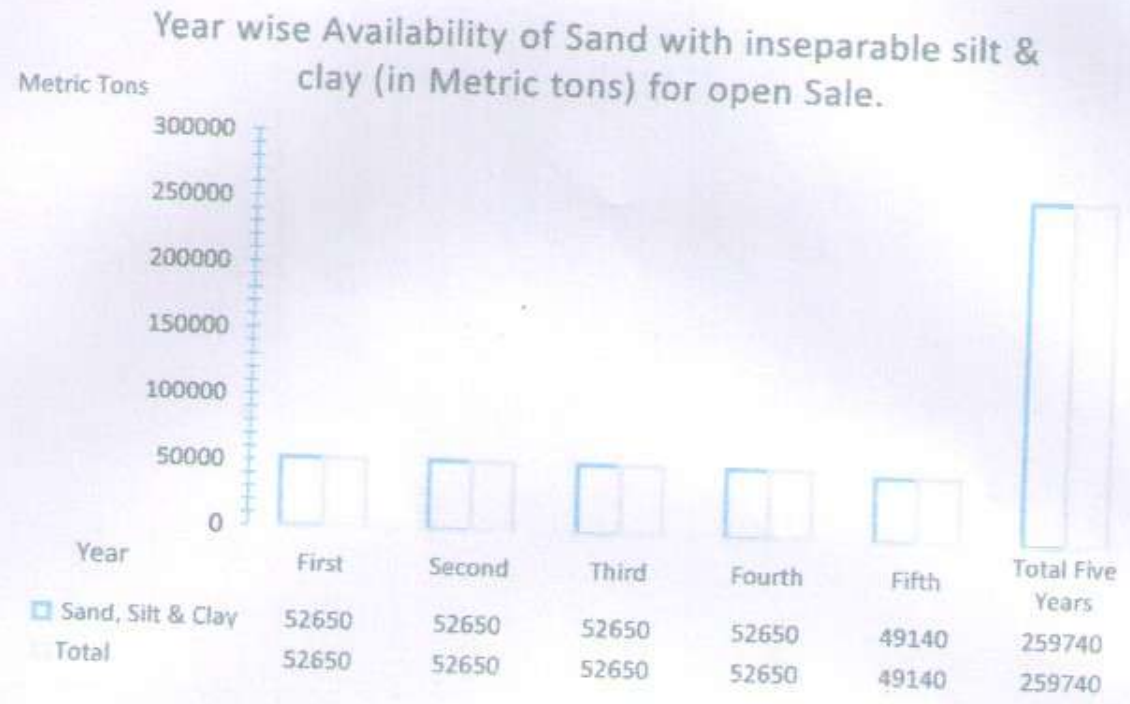


Figure 19: Year wise Availability of Sand

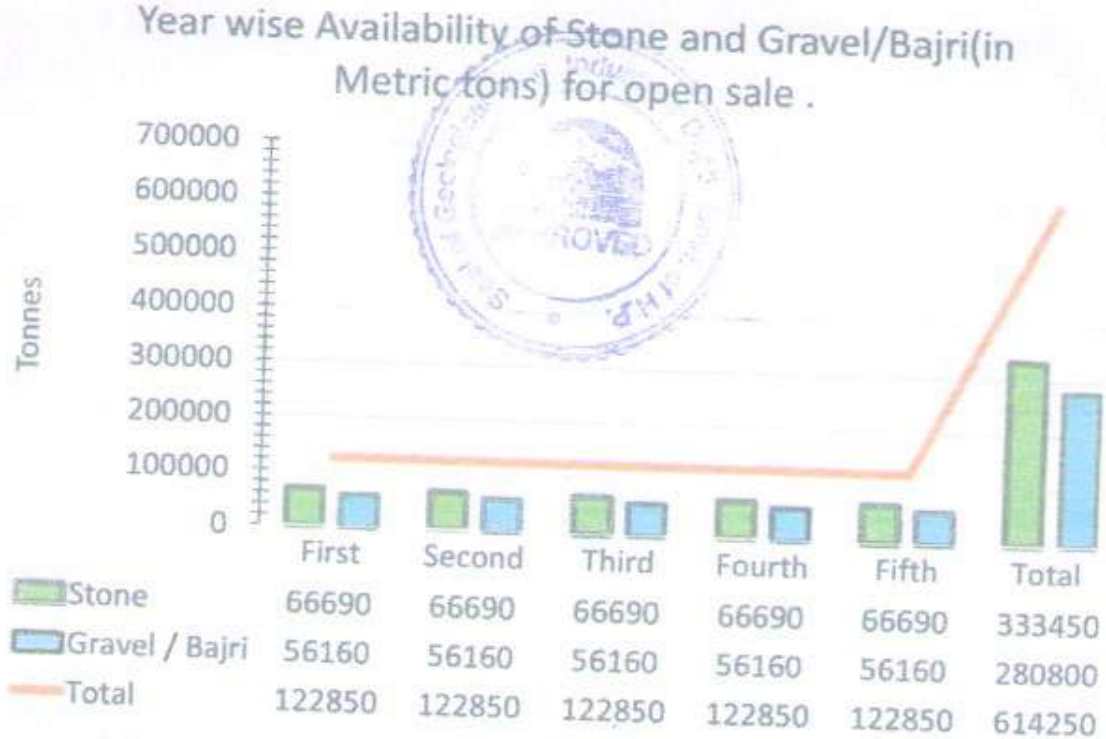


Figure 20: Year wise availability of Stone and Bajri

4.4 Detail of road Transport

The maximum total extraction of minerals stone, sand and bajri for market sale would be 175500 metric tons or 650 metric tons per day. Thus about 73 tipper truck trips would be required to move the material from quarry to market. The track through Seer Khad is about 1 kilometres from the quarry site to road head. The evacuation route is shown in figure 21.

Figure 21: Evacuation Map.

1. ENVIRONMENT MANAGEMENT

1. Base Line Data

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 t

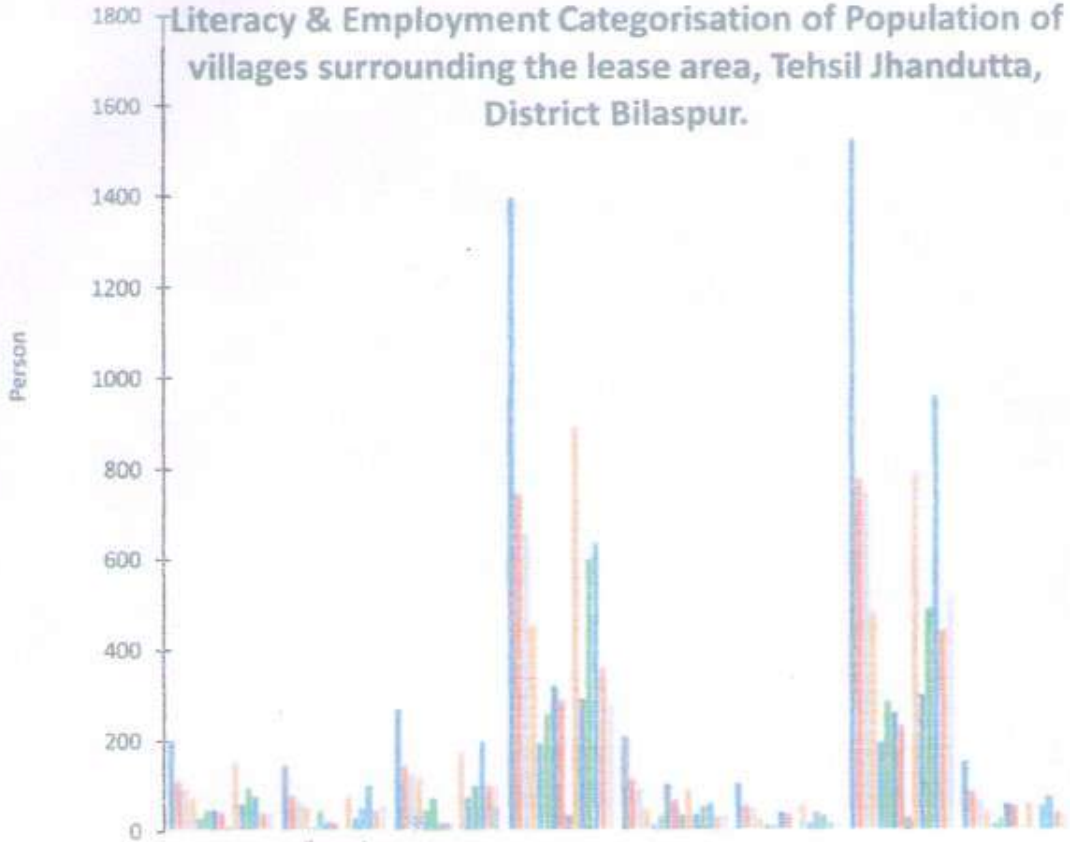
1.. Demography of the area

1.1 Detail of Population Distribution

The total population of the surrounding villages, as per the 2011 Census is given below in the figure -25. The break of population per gainful employment is given in figure 26. The population breakup of Tehsil is given in figure 27. Population break up of workers and literacy of Tahsil Jhandutta of District Bilaspur is shown in figure 28.

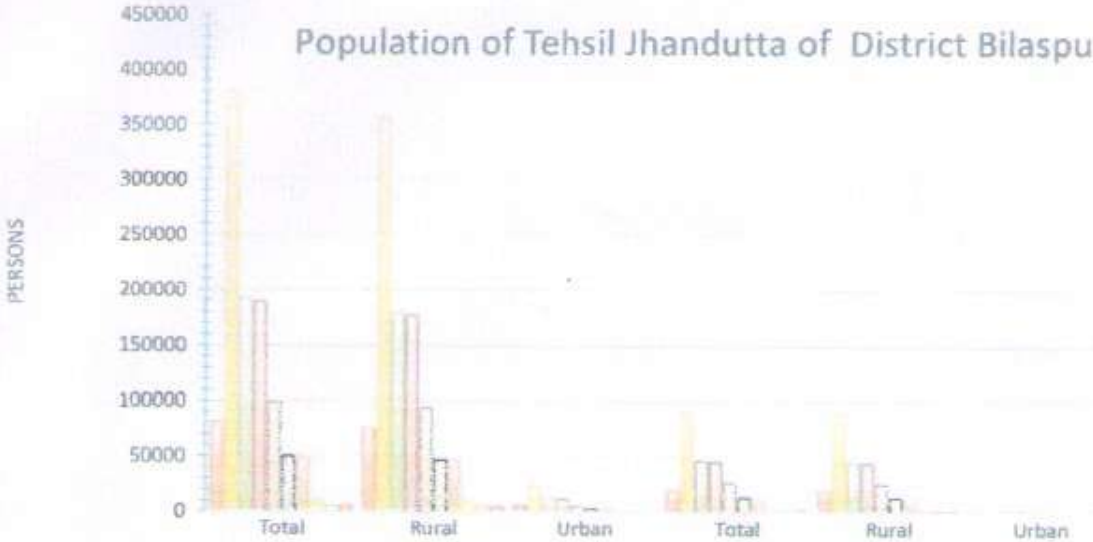
Village	Tungri	Jhareri (208)	Phatoh	Badgaon	Tihra	Raroh	Behran	Baroha
Total House Hold	61	51	83	358	51	24	419	41
Population	0	0	0	0	0	0	0	0
Male	135	88	189	938	131	72	974	100
Female	139	109	199	914	125	60	1036	94
Schedule Caste	7	57	226	597	84	83	674	19
SC_Male	2	26	110	302	45	41	333	11
SC_Female	5	31	116	295	39	42	341	8
Schedule Tribe	0	0	0	0	0	0	9	0
ST_Male	0	0	0	0	0	0	4	0
ST_Female	0	0	0	0	0	0	5	0

Figure 22: Population of the villages of the zone of influence.



	Tungri	Jhareri (208)	Phatoh	Badgaon	Tihra	Raroh	Behran	Baroha
Total Literate	202	144	270	1398	208	106	1526	153
Male Literate	109	78	144	743	115	57	777	86
Female Literate	93	66	126	655	93	49	749	67
Total Illiterate	72	53	118	454	48	26	484	41
Male Iliterate	26	10	45	195	16	15	197	14
Female Illiterate	46	43	73	259	32	11	287	27
Total Workers	46	20	18	321	104	40	261	60
Male Workers	39	17	15	286	68	37	230	55
Female Workers	7	3	3	35	36	3	31	5
Marginal Workers	152	78	172	893	90	58	790	59
Marginal Workers M	58	29	74	291	35	18	299	5
Marginal Workers Fe	94	49	98	602	55	40	491	54
Non-Workers	76	99	198	638	62	34	959	75
Non-Workers M	38	42	100	361	28	17	445	40
Non-Workers Fe	38	57	98	277	34	17	514	35

Figure 23: Break up of literacy and employment of Population in Surrounding Villages (Census 2011).



	Distt. Bilaspur			Tehsil Jhandutta		
Household	80485	74712	5773	19425	18941	484
Population	381956	356827	25129	91562	89190	2372
Male	192764	179653	13111	46167	44916	1251
Female	189192	177174	12018	45395	44274	1121
Schedule Caste	98989	93678	5311	26342	25728	614
SC_Male	50271	47550	2721	13424	13109	315
SC_Female	48718	46128	2590	12918	12619	299
Schedule Tribe	10693	10334	359	2651	2500	151
ST_Male	5485	5290	195	1339	1265	74
ST_Female	5208	5044	164	1312	1235	77

Figure 24: Population break up of Tehsil Jhandutta of District Bilaspur (Census 2011).

1.2 Socio-Economy of the villages.

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. The impact is generally positive. As can be seen in figure 29 there is high percentage of *unemployed (40.37%)* and *underemployed (43.22%)* people in the area despite moderately high level (75.56% literates, figure 28) of literacy.

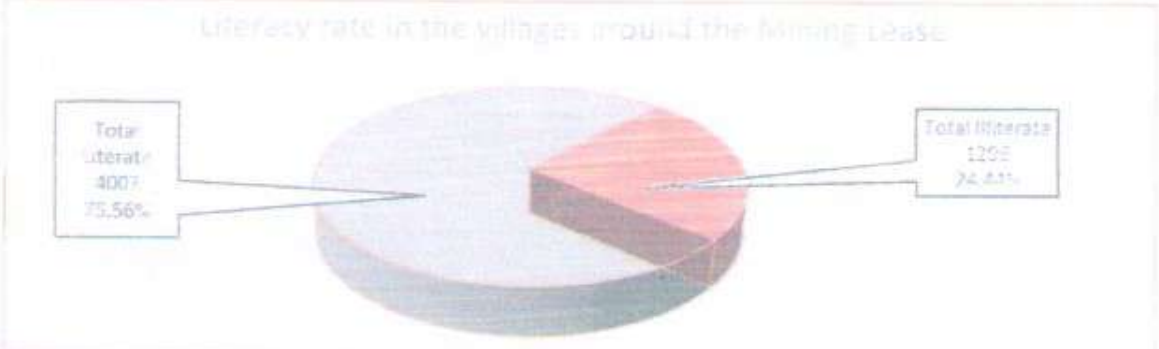


Figure 48:Literacy rate in adjoining villages.

EMPLOYMENT RATE IN THE VILLAGES AROUND THE MINING LEASE AREA

Figure 29: Employment rate in adjoining villages.

1.3. Land Use Pattern

Primarily the land of the district can be classified in following 9 categories as shown below:

1. Land Under Miscellaneous tree crops Etc
2. Culturable Waste Land
3. Forest Land
4. Area under non-agricultural Uses
5. Barren & Un-cultivable Land
6. Permanent Pastures and Other Grazing Land.
7. Fallows Land other than Current Fallows.
8. Current Fallows.
9. Net Area Sown

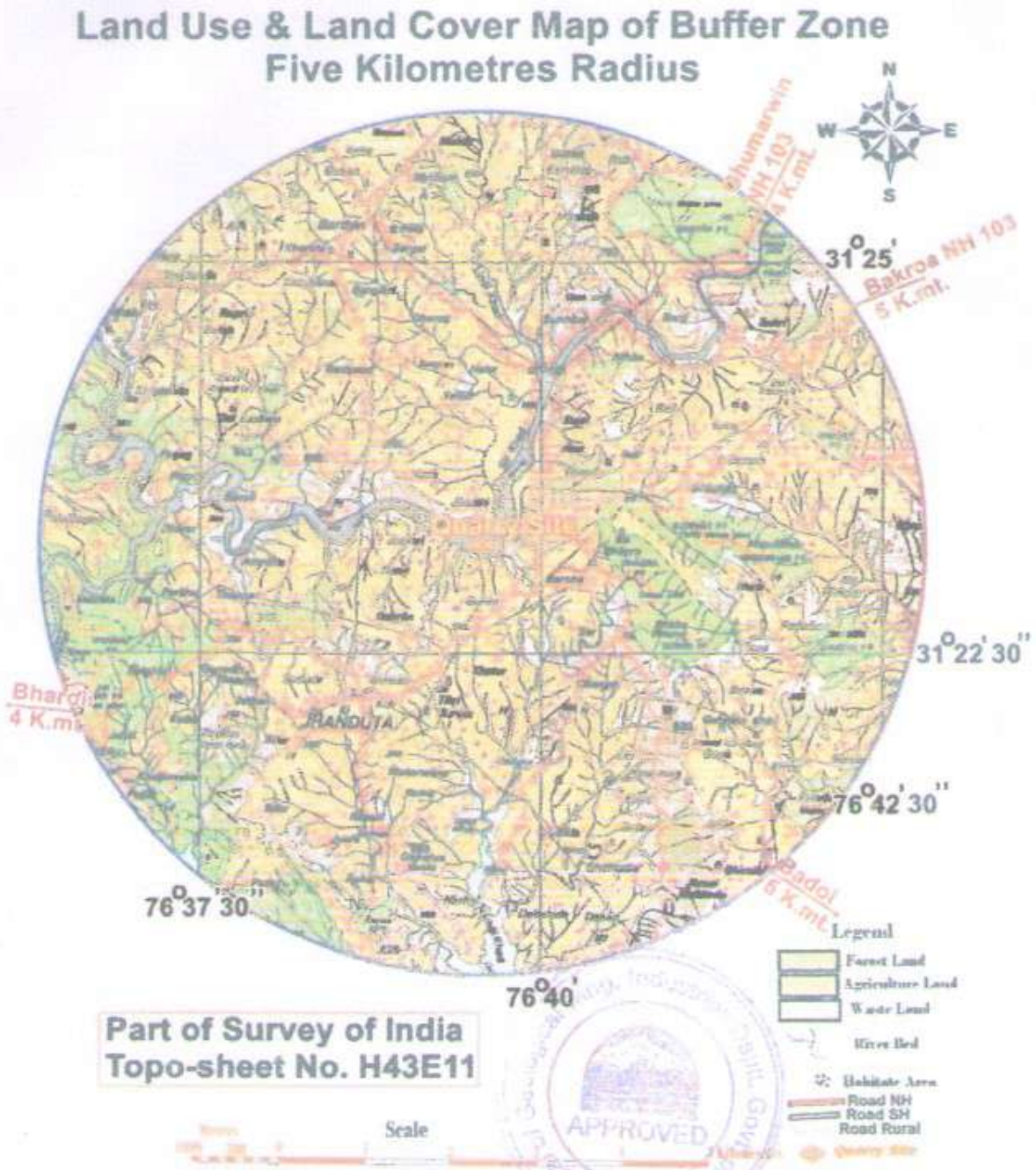
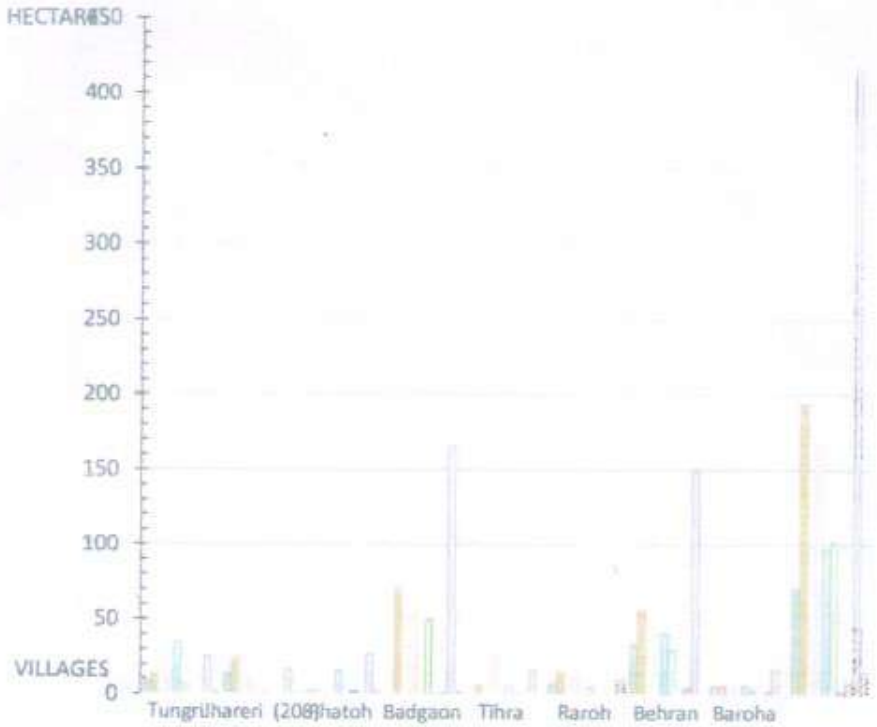


Figure 50: Showing the Five kms Radius Buffer zone.

The land use pattern of the nearby villages of Mining Auctioned area are shown in figure 31. Figure 32 shows the land use pattern & land use percentage for Tehsil I Jhandutta

Land Use Pattern of Villges Around:-Mining Lease Area.



	Tungrihareri	(208)hatoh	Badgaon	Tihra	Raroh	Behran	Baroha	
Forest Area	8.16	13.91	2.1	0	0	6.96	34	6	71.13
Area under Non-Agricultural Uses	13.59	22.91	2.97	70.59	6.59	14.7	57	6	194.35
Barren & Un-cultivable Land Area	1.1	0	0	0	0	0	0	0	1.1
Permanent Pastures and Other Grazing Land Area	14.56	9.66	0	54.18	31.29	11.99	41	6	168.68
Land Under Miscellaneous Tree Crops etc. Area	34.68	0	15.64	0	0	0	41	6	97.32
Culturable Waste Land Area	6.23	1.86	0	49.91	5.84	4.3	30	3	101.14
Fallows Land other than Current Fallows Area	0	0	2.05	0	0.24	0	0	0	2.29
Current Fallows Area	0	0	0	1.5	0	0	4	2	7.5
Total Unirrigated Land Area	24.81	16.49	26.65	165.4	16.33	0	149	17	415.68
Area Irrigated by Source	1.09	0.42	1.46	1.12	0	10.28	0	0	14.17

Figure 25: Showing Land Use Pattern of villages around the mining Auctioned area.

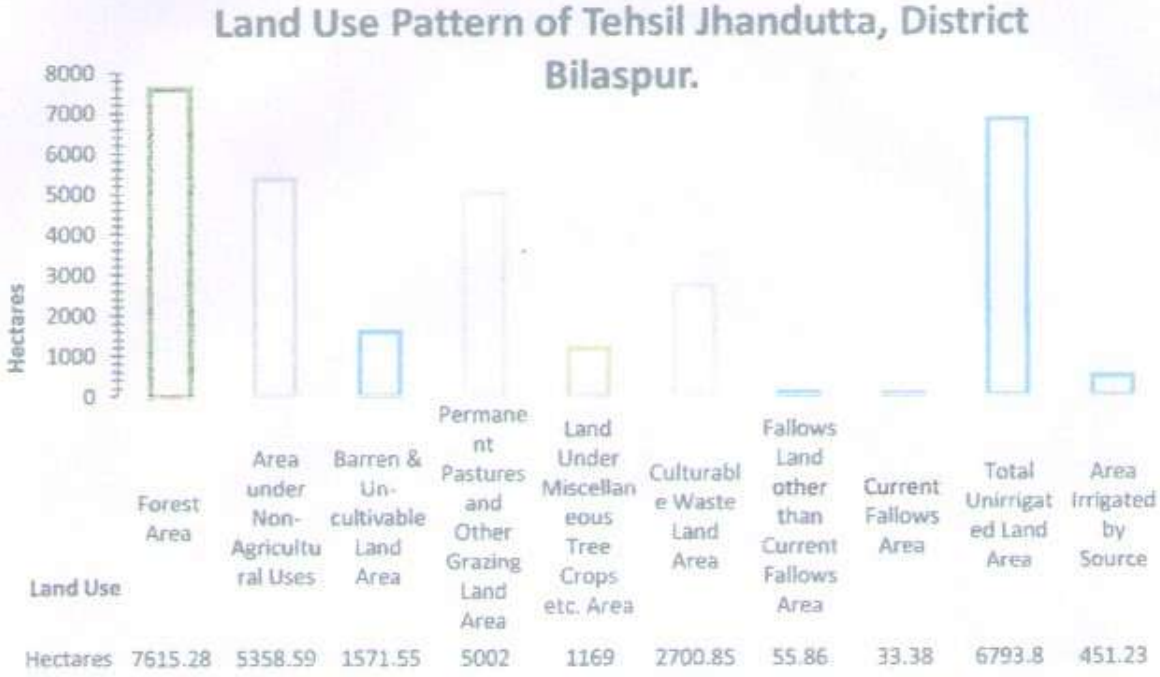


Figure 26: Showing Land Use Pattern of tehsil Jhandutta, district Bilaspur

Figure 33 and figure 34 shows the percentage wise pattern of the villages near the mining area and that of tehsil Jhandutta respectively.

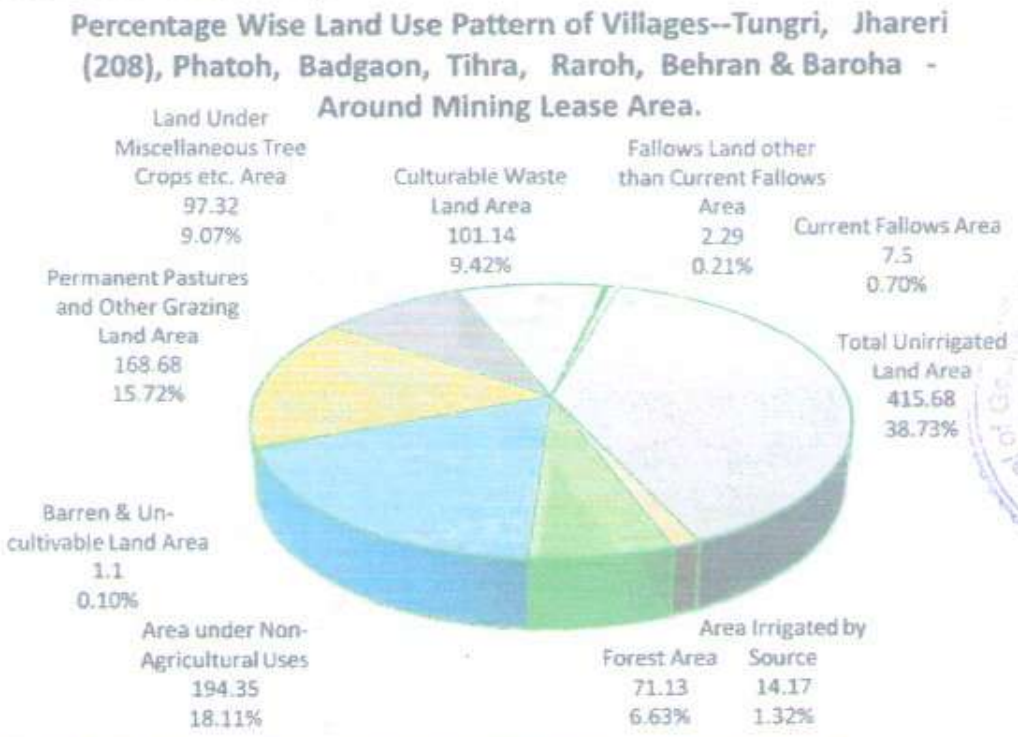


Figure 33: Percentage Wise Land Use Pattern of the nearby Villages

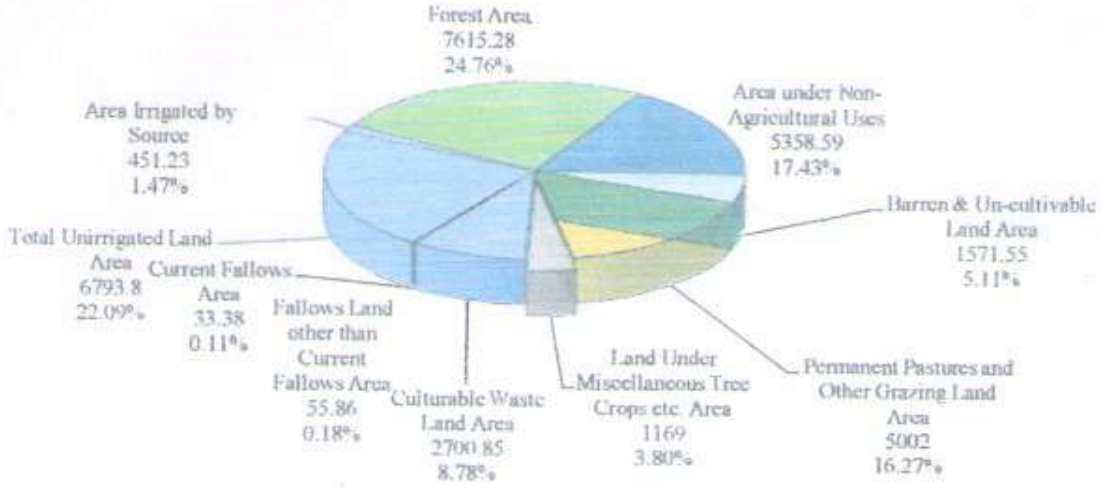


Figure 34: Land Use Pattern of Tahsil Jhandutta of District Bilaspur.

1.4 AGRICULTURE: -

The economy of Bilaspur 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 Bilaspur 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: -35.
figure36 depicts production of each crop in District Bilaspur
Figure 37 Shows area under vegetable, in Hectare and Production, in Metric tons, of District Bilaspur

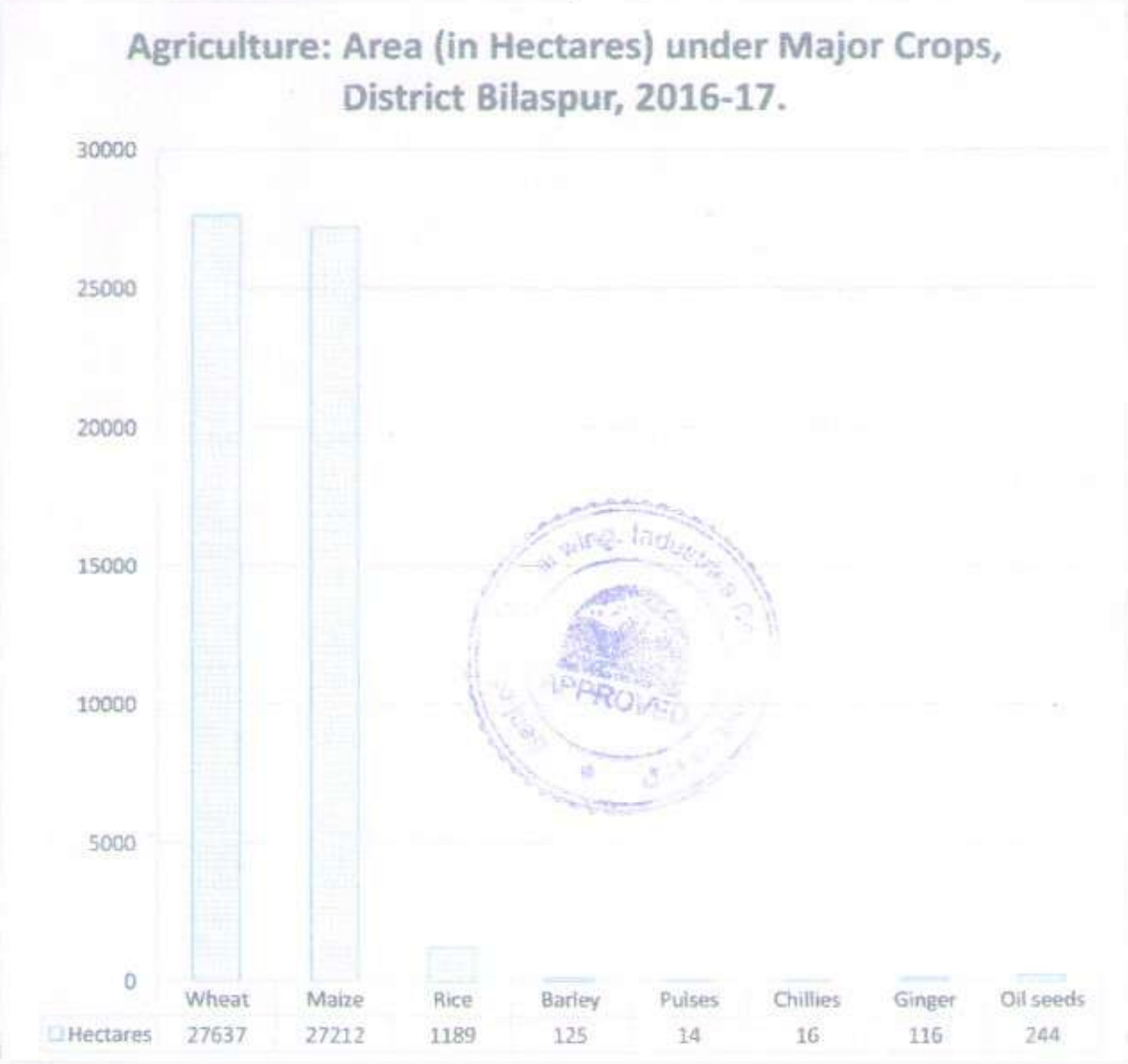


Figure 35 : Showing area under different crops in Bilaspur District.

Figure 36 Showing production of each crop in District Bilaspur

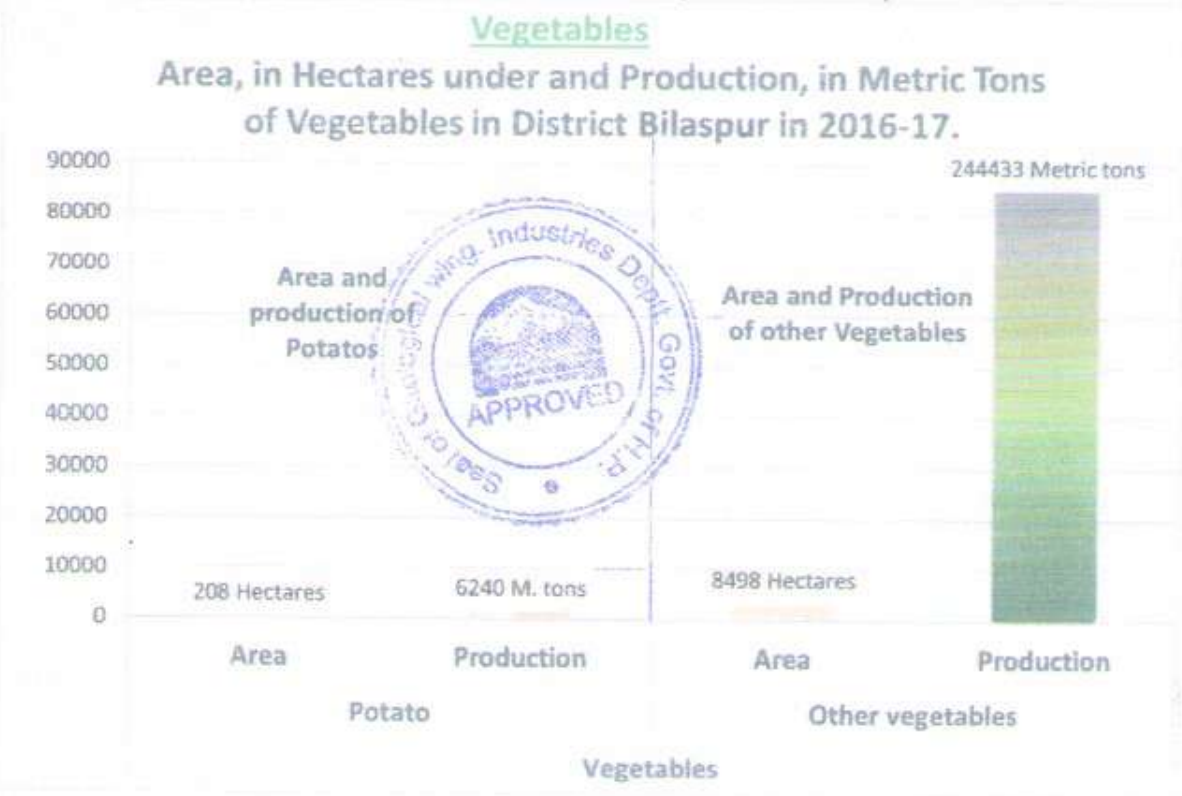


Figure 37: Showing area under vegetable, in Hectare and Production, in Metric tons, of District Bilaspur

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

The area under each fruit as well as the production of each fruit in district Bilaspur are shown in Table 10 as per 2014- 2015 survey.

Table10; Area under each fruit and their production in District Bilaspur

Status of Horticulture
District Bilaspur

Fruit	Area (In Hectares)	Production (In Metric Tons)
Apple	**10**	**4**
Plum	67	9
Peach	107	9
Apricot	1	0
Pear	441	81
Cherry	0	0
Green Almonds	0	0
Persimmon	2	0
Olive	0	0
Kiwi	1	0
Strawberry	0	0
O T F	**619**	**99**
Almonds	21	3
Walnut	16	5
Piccanut	26	2
Nuts & Dry Fruits	**63**	**10**
Orange	276	91
Malta	126	13
K. Lime	655	38

Galgal	261	102
Others	12	2
Citrus	**1330**	**246**
Mango	4045	4579
Litchi	587	622
Gauva	71	402
Papaya	31	153
Loquat	7	8
Aonala	250	133
Grapes	21	4
p-gmate	429	183
Jackfruit	177	24
Others	53	39
O S T F	**5671**	**6147**

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 Bilaspur is given in the figure 38. The population of the Buffaloes and Cattle in District Bilaspur is given in the figure 39.

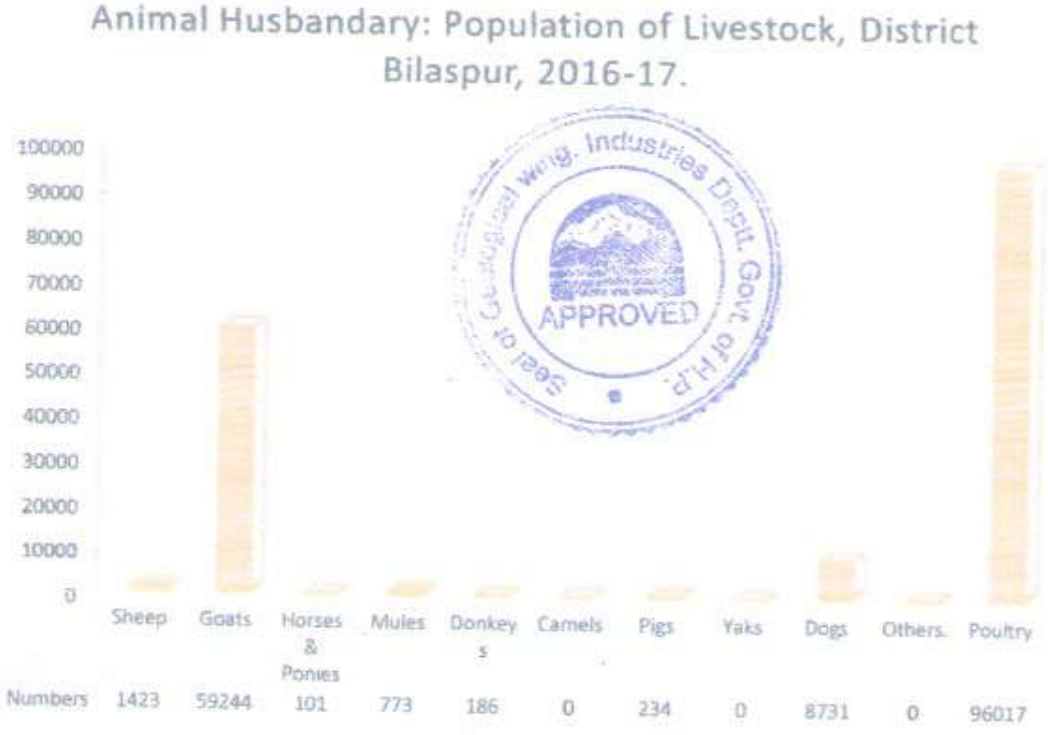


Figure 3827: Livestock population of District Bilaspur

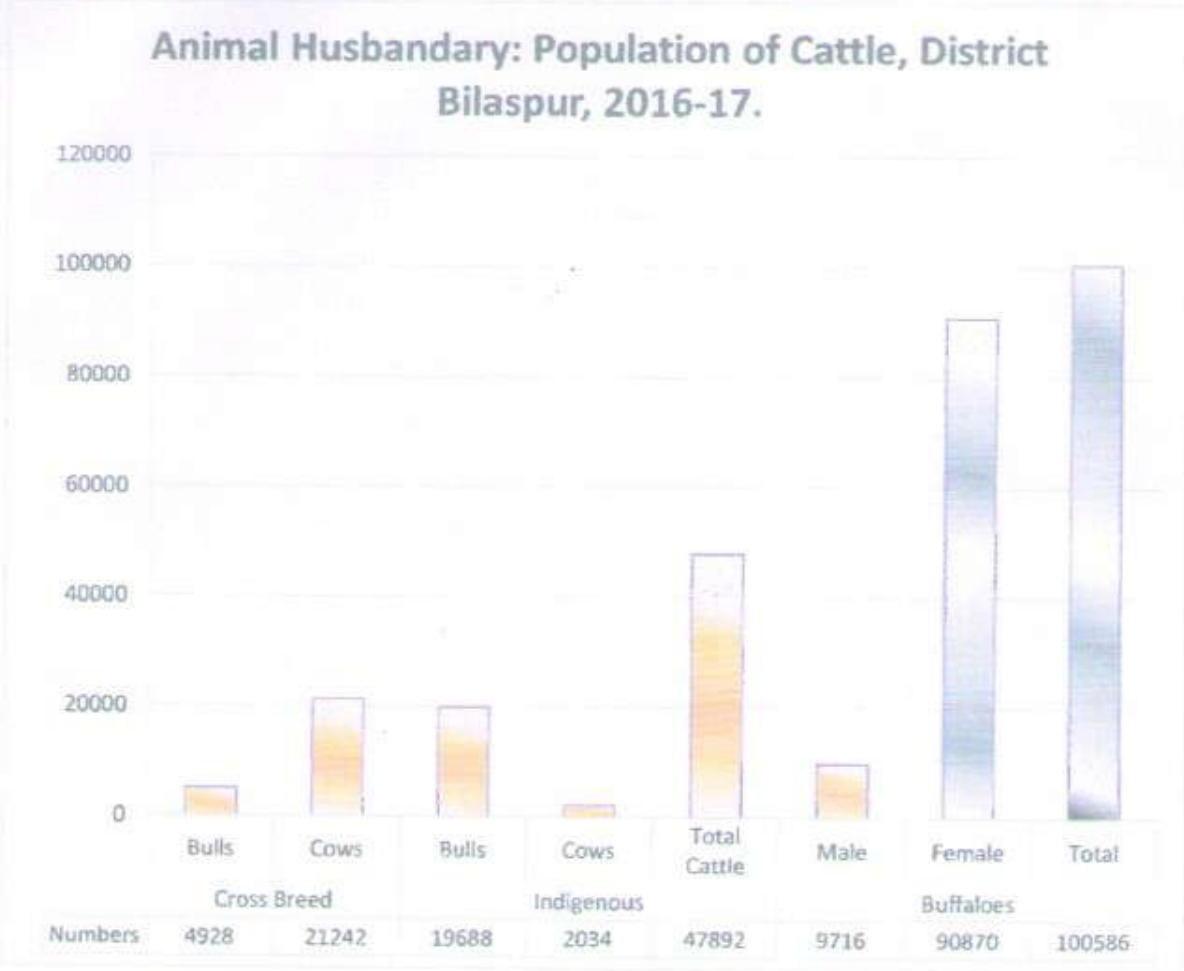


Figure 3928: Showing Population of Cattle Buffaloes in District Bilaspur.

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 Bilaspur district:

Trout
Mahasir
Gid Seviyon
Dise Gugli and
Mirror Carps

The major source of fishery is the Gobindsagar lake.

No fish is observed in the River as it is only a seasonal River.

Yearly production and value of fish catch in the district is given in figure 45.

No perennial stream passes through the area under consideration.

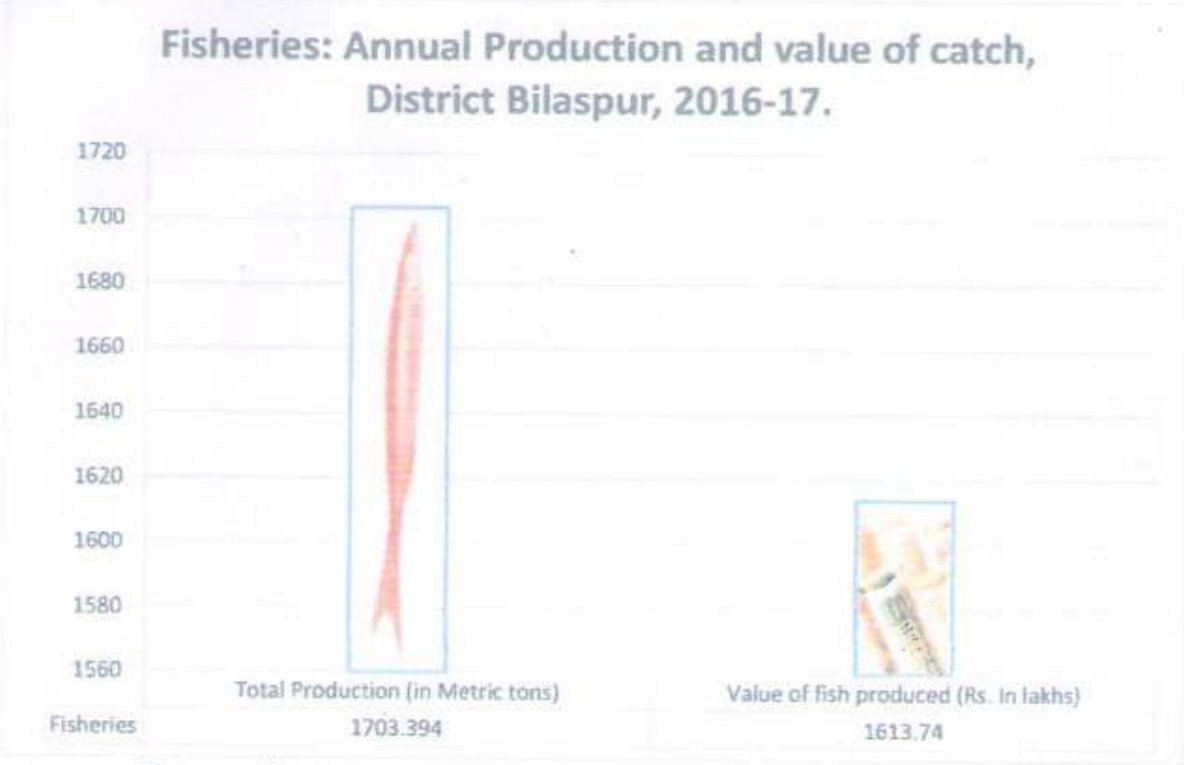


Figure 40: Showing Fish catch / production and its sale value in 2016-17.

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 Bilaspur 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
1. Munj
2. Ber
3. Ipomea
4. Dodonea &
5. 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 Bilaspur District is given in the Table 11

Table 11: Common mammals and birds in the Bilaspur District.

Birds		
Zoological Name	**English Name**	**Common Name**
Milvus migrants	Vulture	Cheel, Gidh, Eell
Eudynamys scolopacca	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 quail	Bater
Alectoris graeca	Chakor	Chakor
Crovus splendens	Crow	Kanwa
Prottacula Korneri	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	
Carduelis spinoides	Himalayan Green Finch	Chiria

Table 12: **Mammals in Bilaspur**

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, Fohiki
Camis aureus	Jackal	Gidder
Macaca mulatta	Ressus monkey	Lal Bander
Preshytes entellus	Languor	Languor
Sus sacrofa	Boar	Suar
Hystrix indica	Porcupine	Sehal
Lepus nigricollis	Hare	Khargosh, Sherra, Ideru
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 Auctioned following are the common birds: -

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

In the Auctionedd 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.

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

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:

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

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 Impact on Land use pattern and Topography and its Mitigation

- It is part of a River bed.
- The highest point of the Auctioned area is at 540 metre above mean sea level.
- The lowest point is at 530m above MSL.
- The mined area in the block would be completely replenished during monsoons floods.
- The mining shall be confined to well within the river bed corridor.
- Mining shall be undertaken to a depth of one metre or water level whichever is less.
- The Auctioned area is and shall remain river bed.
- Thus, the topography or land form of the River bed *per se* will not be changed.
- The land use of the mining Auctioned area is defined in the Revenue record as 'Khad bed.
- The land under active mining would always remain river bed, during as well as post mining.

2.2 Effect On Climate

- The mining Auctioned area is very small, only **81683** square meters.
- Mining will be confined to 78000 square metres safe area.
- The mining depth will be up to one metre or up to water level whichever is less, thus water regime will not be disturbed.
- The mining will be confined from within the river banks.
- 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.

2.3 Impact on Air

- No blasting material is to be used.
- 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).

- The mining activity will be limited to excavation of about 650 metric tons of stone, bajri, sand with silt-clay per day.
- 73 tipper truck trips will be able to move the required material from mine to market. This activity would generate negligible disturbance to air quality

2.4 Impact on Noise Level and Mitigation Measures

- The mining area represents calm surroundings.
- The mining shall be manual causing hardly any noise.
- The noise will be generated by the movement of trucks / tractor trolleys engaged in the transportation of the mined material.
- About 19 trucks trips would be required for transporting mined material per working day from mining area to destination.
- The dedicated tipper truck would be properly and regularly undergoing maintenance so as to create minimum 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.
- A thick belt of broad leaf trees, bushes and shrubs would be planted near the banks of River to screen the noise.

2.5 Effect on Flora & Fauna

- The mining Auctioned area is river bed.
- There is hardly any flora or fauna on the river bed to attract any protective or mitigating measures

2.6 Soil Cover

- The mining will be confine to River bed.
- It has no soil cover as the area gets frequently flooded during monsoons.
- Thus, there shall be no impact on any natural soil cover.

2.7 Impact on Hydrology

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

2.8 Waste disposal Management

The area is in a regular course of Satluj River and silt/clay is the only waste likely to be produced. However, separating it from sand is not an economical proposition. Moreover, for improving the grade of sand it must be washed. The washing of sand within river bed will increase the turbidity of the river water harming the aquatic fauna downstream.

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. The impact is generally positive. As can be seen in figure 29 there is high percentage of *unemployed (40.37%)* and *underemployed (43.22%)* people in the area despite moderately high level (75.56% literates, figure 28) of literacy.

The mining activity though with small direct employment potential but would create jobs for at least 30 persons directly and indirectly, in mining, transportation, and crushing unit.

The mining project and *its downstream* activity of transportation will provide work to as many as 50 persons. Considered their total minimum earning per day to a tune of Rs. 20000 per day (@Rs.400/= per person per day), the area will get a supplementation in its financial and social wellbeing.

2.10 Transport of Mineral

The maximum total extraction of minerals stone, sand and bajri for market sale would be 175500 metric tons or 650 metric tons per day. Thus about 73 tipper truck trips would be required to move the material from quarry to destination. The track through Seer Khad is about one kilometres from the auctioned area to road side. The evacuation route is shown in figure 24.

PART III

1 PROGRESSIVE MINE CLOSURE PLAN/RECLAMATION PLAN

1.0 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 river bed, during as well as post mining. The highest point of the Auctioned area is at 540 metre above mean sea level. The lowest point is at 530 m above MSL.

The mining shall be confined to well within the river bed corridor.

No mining near the banks up to 1/10th of its width is to be undertaken as per guidelines, i.e. 100-200 metres, from banks, in case of sutlej River and 10 to 20 metres in case of Seer Khad.

The mining depth will be up to one metre or up to water level whichever is less, thus water regime will not be disturbed.

The entire quarried material will be replenished and reclaimed by the river during monsoon floods.

The Auctioned area is and shall remain river bed.

Thus, the topography or land use of the River bed *per se* will not be changed. As such no reclamation work of mined area is required to be undertaken

1.1 Mine Waste Disposal:

As explained earlier silt and clay are the type of the waste generated during river bed mining. However, the quantity of silt and clay is hardly 2 percent if separated by washing. The silt and clay being associated minerals of sand in this case shall be marketed along with sand, thus no waste will be left in the lease area to be taken care of.

1.2 Top soil utilization,

As the mining area is part of river bed, having no top soil cover therefore, no top soil is required to be removed, disturbed or disposed of.

1.3. Check Dams.

The rivers in his region have a flatter bed slope, generally form 1 in 50 to 1 in 500. The velocity and its sediment transporting capacity gets reduced encouraging deposition of excess sediment load.

Medium size boulders, gravel and coarse sand are generally found in the beds. The floods are of flashy nature. The Khad in this reach is prone to progressively raise their beds by sediment deposition. In such case, the over bank spills increase year after year, until occurrence of abnormal floods in a year, when sudden change of course may take place.

The yearly mining of River bed up to a shallow depth of one metre is likely to protect the spilling over / overflowing and flooding by the River over the adjoining Agricultural

lands, by eroding the banks and damage the adjoining lands during high floods. Therefore, some protective measures are necessary:

Such as, training measures in the form of marginal bunds / check dams, extending right up to the high ground along the banks are requiring to be undertaken by giving suitable protection with boulders or concrete slabs or boulders in wire crates forming flexible type apron may be provided. Such measure in the form of check dams made with boulders in wire crates along the River banks are proposed. The width of check dams would be about one metres each.

The five-check dam's area are proposed at different five vulnerable locations as shown in the year wise working maps **(Map 3).**

Year	Number of check dams	Length (in meres)	Cost (I Rs)
First	1	8	30000
Second	1	8	30000
Third	1	8	30000
Fourth	1	8	30000
Fifth	1	8	30000
Total	5	40	150000

1.5 Plantation

A little part of quarry falling outside the Seer Khad, above H F L is suitable for plantation. Therefore, some plantation is possible within this area.

a) Year wise area to be covered under forestation.

Year wise area proposed plantation with, number of trees to be planted and amount spent is as given in the chart below

Year	Area to be covered (In Sq. Metres)	Number of trees to be planted	Cost of Plantation
First	100	10	1000
Second	100	10	1000
Third	100	10	1000
Fourth	100	10	1000
Fifth	100	10	1000
Total	500	100	5000

Year wise survival rate.

Though the survival rate is about 50 percent in the area. However, after yearly review it will be ensure that the plants are properly looked after and in case of failure of some plants to survive, these will be promptly replaced. Thus, by the end of five years, the survival rate will be ensured to be at least 60 percent.

2 Strategy for Protection of Point of Public Utility Etc.

There is a cremation ground of the left bank of the auction area. Sufficient buffer zone has been provided for its safety. There is no public utility within the near vicinity of the mining area thus, no specific protection measure is proposed.

3 Manpower Development

The mining activity will be mainly manual. Workers are mainly required in river bed mining for extraction and loading of river bed material in to tipper truck. Drivers for tippers will be another category of workers. Thus, employment potential is as given below:

Mines Supervisor cum clerk	1
Drivers	4
Unskilled workers	45

Thus, total generation of Employment will be to a tune of 50 both skilled and unskilled workers.

4. Use of Mineral

The stone and Bajri will be used as raw material for crushing unit to be established. The stone and bajri will be converted to angular grit for consumption in the construction and infrastructure building industry. The sand along with silt will be directly sold to the construction industry.

5 Other Important Information - Disaster Management & Risk Assessment

The mining Auctioned area part of River bed 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 fall in seismic zone V. 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.

5.a 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 contract for Stone, Bajri and sand situated in Khasra No. 100 (Government Land) measuring 8.1683 Hectares, falling in Mauza & Mohal Jhareri, Tahsil Jhandutta, District Bilaspur, 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: - Shimla

Shyam Kumar
Village: - Tikkari.
Post Office: - Panjgain,
Tahsil & District Bilaspur.

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 Auction Contract for Stone, Bajri and sand situated in Khasra No. 100 measuring 8.1683 Hectares, falling in Mauza Jharerit, Tehsil Jhandutta, District Bilaspur, Letter of Intent granted in favour of Shri Shyam Kumar, Village Tikkari, Post Office Panjgain, Tehsil & District Mandi.

- 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

Seal of Geological wing, Industries Dept. Govt. of H.P. APPROVED

SUTHASH SHARMA
No.HP/RQP/01/1/2004