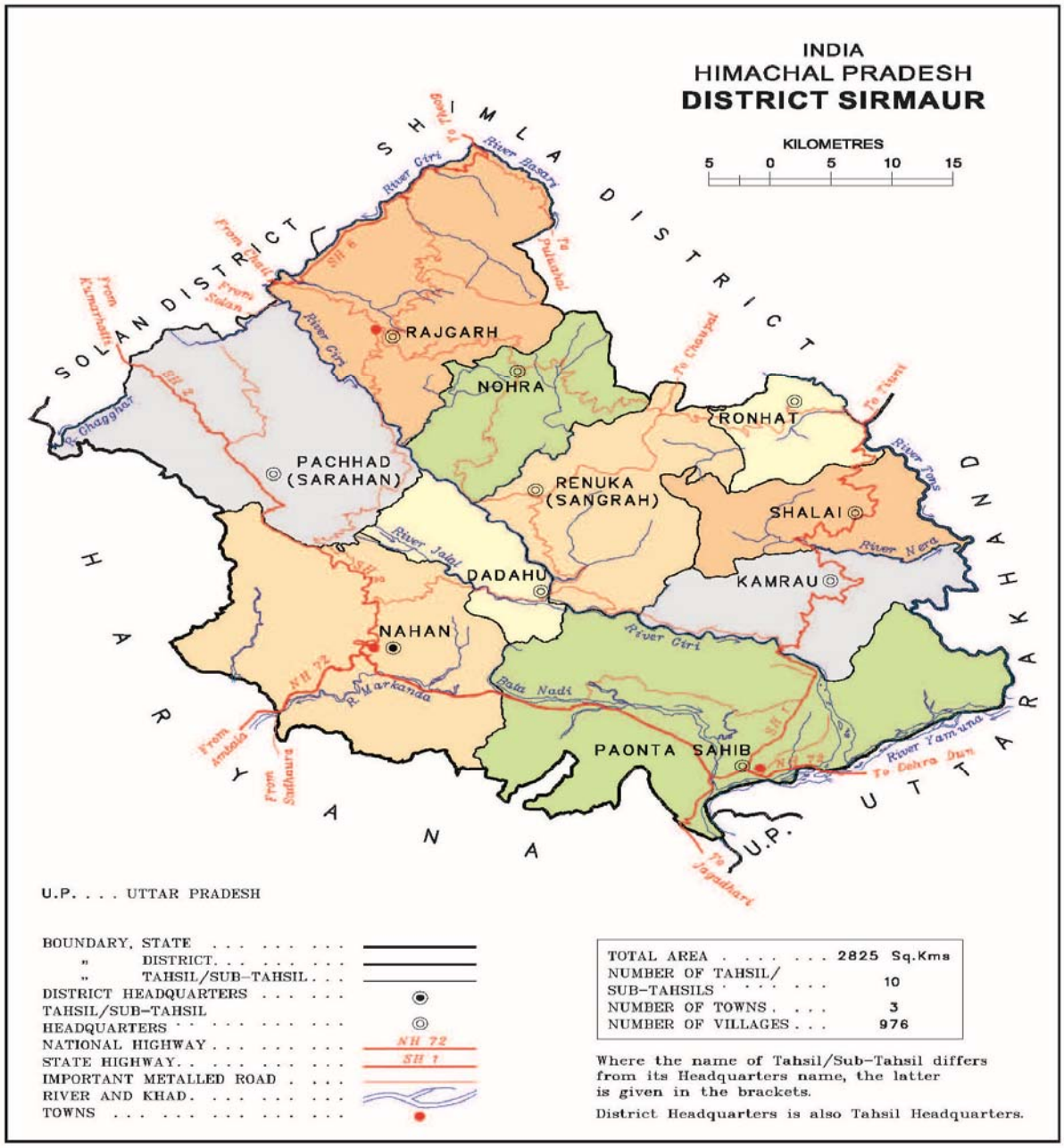
# DISTIRCT SURVEY REPORT-2024
# District- Sirmour Himachal Pradesh




## DISTRICT SURVEY REPORT FOR SAND MINING OR RIVERBED MINING AND OF MINOR MINERALS OTHER THAN SAND MINING OR RIVERBED MINING

Prepared and submitted by Department of Industries, Himachal Pradesh

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*Finalized & approved by SEIAA, Himachal Pradesh in its 69th (A) meeting held on dated 20th August, 2024 vide Agenda Item No. 1.*

# Executive Summary DSR

District Survey Report (DSR) is a comprehensive document prepared to regulate riverbed and hill slope mining activities within the district. This report is essential for sustainable management of riverbed mining, ensuring that the extraction of minerals is conducted in an environmentally sound and socially responsible manner. The preparation of DSRs is mandated under the Sustainable Sand Mining Management Guidelines, 2016.

District Survey Report of riverbed mining are indispensable tools for the sustainable management of riverine mineral resources. They offer a structured approach to resource assessment, environmental protection, regulatory compliance, and stakeholder engagement. By fostering sustainable mining practices, DSRs contribute significantly to environmental conservation, socio-economic development, and the overall well-being of communities dependent on river ecosystems.

As per the EIA Notification, 2006 and its subsequent amendment vide S.O. 3611(E) dated 25th July, 2018 issued by MoEF&CC, GoI, the main objective of the preparation of District Survey Report (as per the Sustainable Sand Mining Guideline) is to ensure the identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area.

- Key Aspects of District Survey Report

1. Assessment of Resources: DSR provide a detailed assessment of available mineral resources in the riverbeds within the district. This includes data on the quantity, quality, and distribution of sand and other minor minerals. By accurately estimating these resources, the report aids in preventing over-extraction and depletion of minerals.
2. Environmental Impact Analysis: The report include an analysis of the environmental impact of riverbed mining. This encompasses the effects on river morphology, hydrology, aquatic ecosystems, and biodiversity. Understanding these impacts is crucial for mitigating adverse environmental effects and preserving riverine ecosystems.
3. Regulation and Compliance: DSR serve as a regulatory framework for riverbed mining operations. They outline guidelines and standards for mining practices, ensuring compliance with national and state environmental laws. This helps in curbing illegal mining activities and promoting legal and regulated mining.
4. Sustainable Mining Practices: By recommending sustainable mining practices, DSR help in minimizing environmental degradation. These practices may include controlled mining depths, restricted extraction zones, and periodic replenishment studies to maintain the ecological balance of river systems.
5. Socio-Economic Considerations: The report also takes into account the socio-economic aspects of riverbed mining, including the impact on local communities. This includes evaluating benefits such as employment generation and revenue for local governments, as well as addressing negative consequences like displacement and loss of livelihoods.
6. Data-Driven Decision Making: DSR provide a scientific basis for decision-making regarding riverbed mining. The inclusion of geospatial data, remote sensing images, and field surveys enhances the accuracy and reliability of information. This data-driven approach supports informed policy-making and resource management.
7. Stakeholder Involvement: The preparation of DSR involves consultation with various stakeholders, including government agencies, local communities, environmentalists, and industry representatives. This inclusive process ensures that multiple perspectives are considered, leading to balanced and equitable mining practices.

- Benefits of District Survey Report

1. Environmental Protection: By identifying and mitigating the environmental impacts of riverbed mining, DSR play a crucial role in protecting river ecosystems, reducing erosion, and maintaining water quality.
2. Resource Management: Effective management of mineral resources is achieved through regulated extraction, preventing over-exploitation and ensuring the longevity of resources for future use.
3. Legal Compliance: DSR help in ensuring that mining activities adhere to legal requirements, reducing the incidence of illegal mining and associated environmental damage.
4. Community Welfare: By considering the socio-economic impacts, DSR help in safeguarding the interests of local communities, ensuring that they benefit from mining activities without suffering undue harm.
5. Sustainable Development: The integration of sustainable practices in mining operations contributes to the broader goals of sustainable development, balancing economic growth with environmental stewardship.

- While issuing any fresh permission for mining activity in the district the same is permissible only when the identified stretch is reflected in the DSR with its geo coordinates, quantity and geological profiling.
- The SEIAA/ SEAC while considering the cases for grant of EC need to assess with the help of DSR the proposed mining activity is within the identified stretches of river/ streams/ khads, matching the geo coordinates of proposed site and river stretch where the mineral is available by using ***kml*** files.
- In the DSR 'No Mining Zones' are also listed which clearly give a view of stretches where no mining activity will be allowed and remain restricted.

"*No Mining Zones*" (NMZs) are critical areas identified within riverbeds where mining activities are strictly prohibited. These zones are delineated based on various environmental, ecological, and social criteria to ensure the protection of sensitive areas. The identification of NMZs is a key component of District Survey Report (DSR) for riverbed mining in India, aimed at promoting sustainable and responsible mining practices.

Criteria for Identifying No Mining Zones in DSR

1. Ecological Sensitivity: Areas with high ecological value, such as habitats for endangered species, breeding grounds for aquatic life, and regions with significant biodiversity, are designated as NMZs. Protecting these areas is crucial for maintaining ecological balance and biodiversity.
2. Hydrological Importance: Zones critical for maintaining river flow and groundwater recharge are marked as NMZs. This includes regions near riverbanks, floodplains, and areas prone to erosion. Preserving these areas helps in sustaining water quality and quantity.
3. Proximity to Infrastructure: Areas close to infrastructure such as bridges, roads, dams, and human settlements are identified as NMZs to prevent structural damage and ensure the safety of human life and property.
4. Cultural and Archaeological Significance: Regions with cultural, historical, or archaeological importance are protected as NMZs to preserve heritage sites and prevent any damage due to mining activities.
5. Community Dependence: Areas that are vital for the livelihood of local communities, such as regions used for fishing, agriculture, and other traditional activities, are designated as NMZs. This ensures the sustenance of community livelihoods and social well-being.

Basis for appraisal of EC (River Bed Mining Projects)

| Sl. No. | PP Details | Location with khasra Nos. | River/ Stream location | Coordinates (Lat Long) | Area of Mining lease (ha) | Period of Mining lease (Initial) | | Period of Mining lease | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | From | To | Form | To |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | | | | | | | | |
| | | | | | | | | | |

Details of River/ Stream

| S. No. | Name of the River or Stream | Total Length in the District (in Km) | Place of origin | Altitude at Origin |
|---|---|---|---|---|
| (1) | | | | |
| (2) | | | | |

| Portion of the River or Stream Recommended for Mineral Concession | Length of area recommended for mineral concession (in kilometer) | Average width of area recommended for mineral concession (in meters) | Area recommended for mineral concession (in square meter) | Mineable mineral potential (in metric tonne) (60% of total mineral potential) |
|---|---|---|---|---|
| | | | | |

## *Mineral Potential*

| Boulder (MT) | Bajari (MT) | Sand (MT) | Total Mineable Mineral Potential (MT) |
|---|---|---|---|
| | | | |
| | | | |

| S. No. | River or Stream | Portion of the river or stream recommended for mineral concession | Length of area recommended for mineral concession (in kilometer) | Average width of area recommended for mineral concession (in meters) | Area recommended for mineral concession (in square meter) | Mineable mineral potential (in metric tonne) (60% of total mineral potential) |
|---|---|---|---|---|---|---|
| (1) | | | | | | |
| (2) | | | | | | |
| Total for the District | | | | | | |

# CONTENTS

# 1 INTRODUCTION

Minerals are valuable natural resources being finite and non-renewable. They constitute the vital raw materials for many basic industries and are a major resource for development. The history of mineral extraction in India dates back to the days of the Harappan civilization. The wide availability of the minerals in the form of abundant rich reserves made it very conducive for the growth and development of the mining sector in India. The country is endowed with huge resources of many metallic and non-metallic minerals. Mining sector is an important segment of the Indian economy. Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. India produces as many as 87 minerals, which includes 4 fuel, 10 metallic, 47 non-metallic, 3 atomic and 23 minor minerals (including building and other materials).

Minerals are classified into two groups, namely (i) Major minerals and (ii) Minor minerals. Amongst these two groups minor mineral have been defined under section 3(e) of Mines and Minerals (Regulation and development) Act, 1957. The minor minerals are further governed by "The Himachal Pradesh Minor Minerals (concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015". The Minor minerals include building stones, gravel, ordinary clay, ordinary sand, limestone used for lime burning, boulders, kankar, murum, brick earth, bentonite, road metal, slate, marble, stones used for making household utensils etc. and other minerals not defined as minor minerals in the said Act are treated as major minerals. They include coal, kyanite, sillimanite, barites, chromite, fluorite, quartz, sand used for stowing purposes in coal mines and many other minerals used for industrial purposes.

The mining activities in the state of Himachal Pradesh can basically be categorized as in large sector and in small sector. The large sector comprises of limestone projects for manufacturing cement and other lime products while the small mining sector comprises mining of minor minerals like sand, stone, bajri, slate, shale and clay etc. which are basically building material to meet up the demand for infrastructure development of the state.

In pursuance to the orders of Hon'ble Supreme Court dated 27.02.2012 in the matter of Deepak Kumar etc. vs State of Haryana and Others, prior environment clearance has now become mandatory for mining of minor minerals irrespective of the area of mining lease. In order to comply with the judgment of Hon'ble Supreme Court, the Ministry issued S.O.141 (E) dated 15.01.2016 vide which the District Level Environment Assessment Committee (DEAC) and District level Environment Imapact Assessmenyt Authority (DEIAA) were constituted. In the said Notification at point No.7 (iii) the procedure to prepare the District Survey Report (DSR) was laid down providing that a survey shall be carried out by the DEIAA with the assistance of Geology/Irrigation/Forest/PWD etc. departments. As, per the aforesaid, Notification dated 15.01.2016 the Geological Wing, assisted the DEIAA in the preparation of District Survey Report during the year 2016 and the said District Survey Report prepared for District Kangra was approved by the DEIAA, after following the procedure laid down in the aforesaid Notification. It is also provided in the Notification No. S.O. 141 (E) dated 15th January, 2016 that the District Survey Report (DSR) shall form the basis for application for Environment Clearence, preparation of reports and appraisal of Projects.The report shall be updated once every 5 years.

In the aforesaid notification dated 15.01.16, the Hon'ble High Court of Jharkhand at Ranchi in its orders dated the 11th April, 2018 and 19th June, 2018 in W.P. (PIL) No. 1806 of 2015, in the matter of Court on its Own Motion Versus the State of Jharkhand & Others with W.P. (PIL) No. 290 of 2013, in the matter of Hemant Kumar Shilkarwar Versus the State of Jharkhand & Others, has inter-alia directed the preparation of District Survey Report for the Sand mining or riverbed mining and for minor minerals other than Sand and bajri or delegation of the powers for preparation of format of District Survey Report of minor minerals other than sand and bajri to the State Government and/or District Environment Impact Assessment Authority and District Expert Appraisal. Thereafter, the Ministry of Environment, Forests

and Climate Change (MoEF & CC) vide notification dated 25.07.2018 provided the procedure for the preparation of the District Survey Document. Accordingly the survey report for district Sirmour has been updated. This District Survey Report has been updated by covering the mineral bearing areas and overviews of mining activities in the district with all the relevant features pertaining to geology and mineral wealth in replenish-able and non-replenish-able areas of rivers, stream and other sources. The mineral potential has been calculated based on field investigations taking in to consideration the geology of the catchment area of the river/streams and other sources.

# 2 OVERVIEW OF MINING ACTIVITY OF DISTRICT SIRMOUR

Three types of minor mineral constituents such as sand stone and bajri are required for any type of construction apart from other material like cement and steel. In earlier times, the houses/ buildings were constructed in form of small dwellings with walls made up of mud plaster, stone and interlocking provided with wooden frames and there were negligible commercial as well as developmental activities resulting less demand of building material. However, with the passage of time when the District was carved out during new vistas of developmental activities were started. As such the demand of minor mineral in the District started an increasing trend. The increase could be gauged from the fact that during year 2013-14 the royalty receipt on minor mineral was merely Rs. 7.62 Crore which has increased to Rs. 25.38 Crore (Approx.) in the year 2022-23. The quantity of minor mineral consumption is a thermometer to assess the quantity of developmental activities being undertaken in a particular area.

In order to meet the requirement of raw material for construction, the extraction of sand, stone boulder and bajri is being carried out exclusively from the riverbeds and hill slopes. The demand of sand is mainly met through by river borne sand whereas the demand of bajri/grit is either met through river borne collection or through manufactured grit by stone crushers. Also, the demand of dressed or undressed stone is met through the broken rock material from the hill slope. The local residents used to lift gravel etc. from the river beds to meet out their bonafide requirement, however, after coming into force the Himachal Pradesh Minor Mineral Concession and Minerals (Prevention of illegal mining, transportation and Storage) Rules, 2015 as the mining was allowed in accordance to the rules. Presently in this District mineral concessions are being granted through grant of mining Lease. At present 66 nos. of mining leases for minor minerals and 30 nos. of mining lease for Limestone have been granted under the ibid rules in different parts of the District and the detail is tabulated below. 40 quarries of quarries has been auctioned in District Sirmour in different riverbeds i.e. river Yamuna, Giri & Sunkar etc. Out of which 2 quarries has been operational till date and detail is tabulated below. All quarries identified for auction in District Sirmour has been auctioned and no further quarries remains for auction in District Sirmour.

# 3 GENERAL PROFILE OF THE DISTRICT

Sirmour is located in the southern part of the Himachal Pradesh and is situated between 30o22’30” to 31o01’20” north latitude and 77o01’12” to 77o49’40” east longitude The district has a total area of 2,825 sq. km. which cover 5.07 per cent area of the state. The population density in the District is 162 persons per square Kms. The District has the 70.40% of literacy rate.

The district is bounded by Shimla district in the north, Solan district in north-west, state of Haryana in the south and west While the state of Uttrakhand make its eastern boundary.

## Salient Features of the district

Geographical Area - 2825.0 Sq. Km
Total Population - 4,58,593 (2001 census)
Number of Sub-Divisions - 5
(i) Nahan
(ii) Paonta Sahib
(iii) Rajgarh
(iv) Sangrah
(v) Shillai
Number of Tehsils - 9
1 Nahan
2 Paonta Sahib
3 Pachhad
4 Shillai
5 Sangrah
6 Rajgarh
7 Dadahu
8 Nohradhar
9 Kamrau
Number of Sub-Tehsils - 4
1. Ronhat
2. Pajhota
3. Narag
4. Haripurdhar

Number of C.D. Block - 6
1. Nahan
2. Paonta Sahib
3. Pachhad
4. Shillai
5. Sangrah
6. Rajgarh

Number of Gram Panchayat - 228
Number of villages - 966
Total Population - 4,58,593 (2001 census)
Density per Sq Km - 162

District Sirmaur is located in outer Himalayas which is commonly known as Shivalik range.This district is bounded by district Shimla in North Uttrakhand in East, Haryana in South and Distt. Solan in North-West. Like other parts of Himachal Pradesh , it has beautiful landscapes, bracing climate, big and small game and legendry temples which hold abiding attraction for the tourists. The Siwalik Hills are located within the political boundaries of Pakistan, India, Nepal, and Bhutan, and ranges between 6 to 90 km in width. They gradually become steeper and narrower in relief and width respectively, from northern Pakistan to Bhutan (over 2000 km in length). 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), earth-pillars, rilled earth buttresses of conglomerate formations, semi-circular choedivides, 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. To the south of the Siwaliks are the Indo-Gangetic plains and in the north, they are bordered by the Lesser Himalayas.

Intermittently located between the Siwaliks and the Lesser Himalayas (exclusively in India and Nepal) are duns, flat-bottomed longitudinal structural valleys with their own drainage systems. These essentially comprise several large Himalayan piedmont alluvial fans and terraces, which formed as a result of tectonic episodes in the flanking Siwaliks. The duns also consist of lacustrine, fluvial, aeolian and swamp-environment deposits, and range from Middle Pleistocene to Holocene in age. During their formative stage, most of the duns were slightly narrower and have gradually expanded over time through the erosion of the adjacent Siwaliks sediments (a continuing process). In Nepal, these duns were often naturally filled with alluvial sediments of lacustrine and fluvial deposits, thus burying palaeolithic sites that were later exposed through erosion. The monsoon rains temporarily supply seasonal streams (locally known as choes, khads, or nalas) located both within the Siwalik hills and the adjacent duns. These stream banks and their terraces yield sizeable numbers of lithic artefacts, owing to the shared location for both water and raw material.

The district is bounded by Shimla District on the north and Solan district in the orth-west, state of Haryana in the south and west while the state of Uttarakhand makes its eastern boundary. Geographically the district can be divided into three parts: -

1. The Trans – Giri (Gir Par Region)
2. Cis – Giri Region (Giri War Region)
3. Plains of Kiar-da-Dun or Dun Valley.

The Trans - Giri region consists of the mountains culminating into the Chur Peak which is commonly known as Chur Chandni Ki Dahr (the hill of silver bangle). It has an attitude of 3647 meter above the mean sea level. From this lofty mountain runs two ranges one in the north - west direction called Dhar Taproli-Jadol and other Dhar Nohra which runs south - east direction toward Haripur Fort at an altitude of 2677 meter above the mean sea level where it is divided into two ranges , one of which runs almost east to the valley of Tons. Two other ranges runs north - west called Dudham Dhar and south- west with many minor spurs from them toward the Giri River. The second range initially runs south - west under the name of Dhar Nagali and then turns to east under the name of Dhar Kamrau. Dhar Shalai runs parallel to this Dhar ub northern side and both of them form the valleys of Nera River.

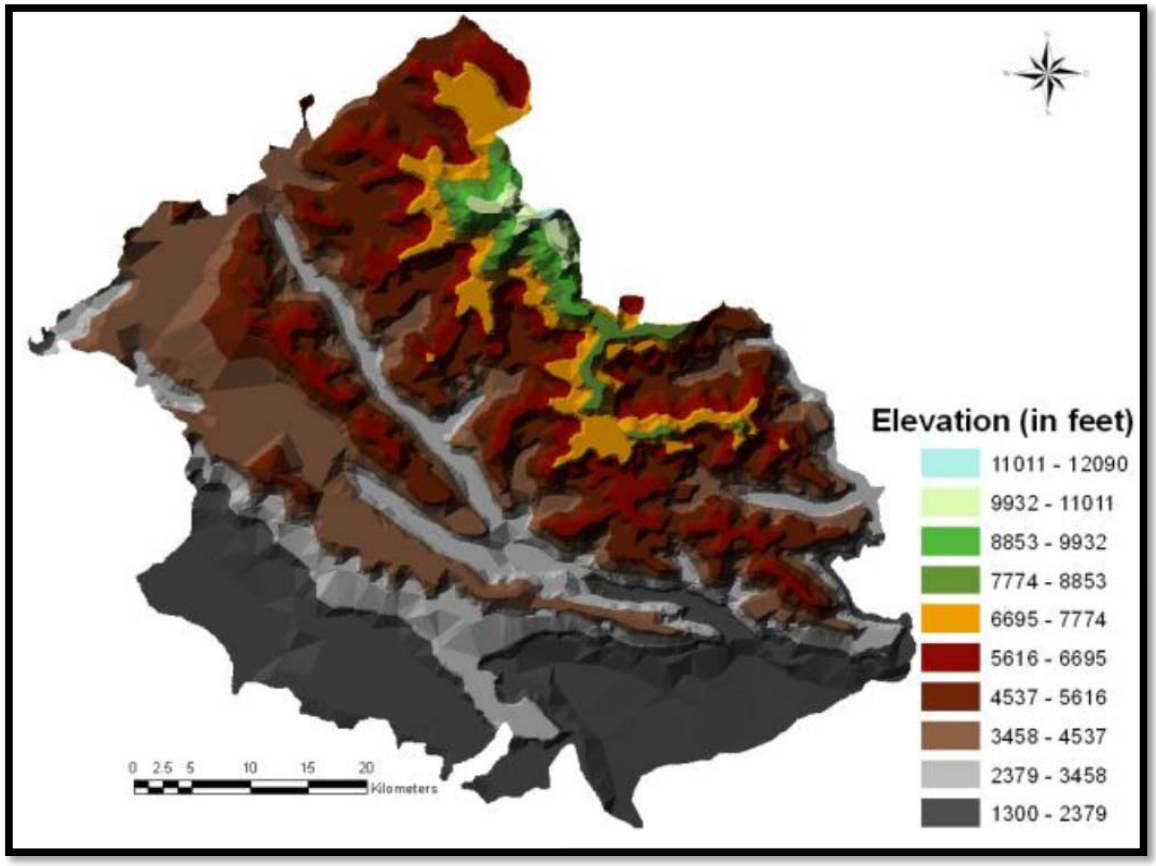
The Cis- Giri region is intersected by three main ranges which runs from noth-west to south-east, the Sain Dhar which runs parallel to Giri River. The second is the Dharti Dhar or what is called little range. Between these two ranges flows Jalan River. The third is quite low range, which runs from Kala Amb area to south of Nahan tehsil and form an open valley with Dahi Dhar. In the western half of this area the Markanda River flows. Between eastern extremities of this Dharti Dhar lies open valley Known as Kiar -da - dun valley which border the Yamuna and Giri River in the east and form the boundary of District with Uttarakhand. It also touches western portion of Nahan tehsil. This flat valley is irrigated by Bata River which flows from east to west originating from Dhati Dhar. Geomorphologically the district can be divided into three zones: -

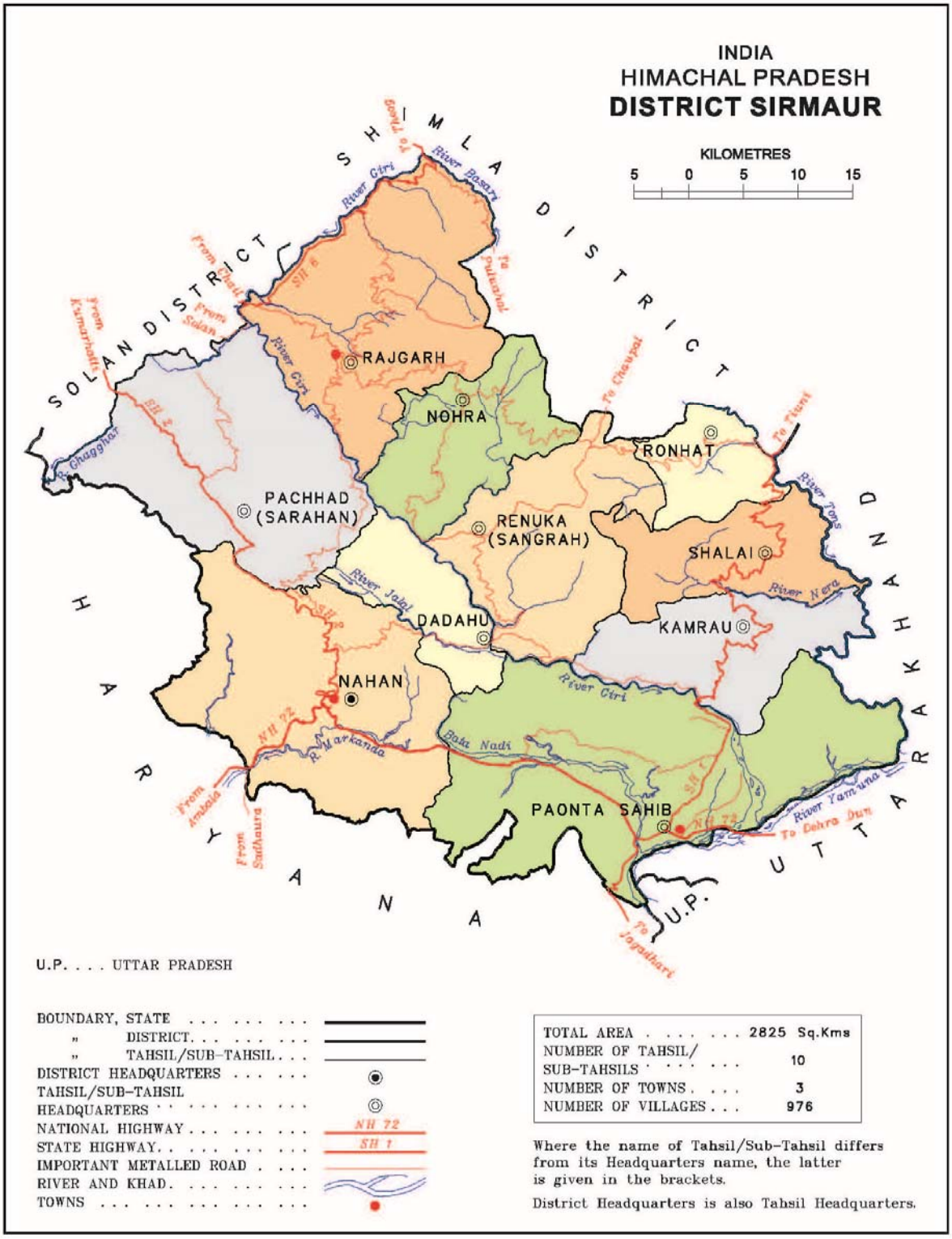
1. Steep to very steep high hills of lesser Hima;aya
2. Moderately steep to steep low hills and intervening valleys of Shiwalik
3. Piedmont Plains

Sirmaur district presents an intricate mosaic of high mountain ranges, hills and valleys with altitude ranging from 300 to 3000 m above MSL. There is general increase in elevation from south to north and from east to west. In general trance Giri terrain exhibits highly rugged mountain terrain. The

highest peaks in Chaur dhar remain snow bound throughout the year. Low denuded hill ranges of Siwalik represent the southwestern part of the district. In the areas underlain by high hill ranges of Himalayas, the valleys are narrow and deep with steep slopes. The terrain is moderately to highly dissect with steep slopes. Paonta valley, trending NW-SE, have an area of about 230 sq km and lies between the main Himalayan ranges on the north and outer Siwallik hill range in the south.

The Yamuna River that forms the eastern district boundary with the State of Uttranchal drains major part of Sirmaur district. Tons, Giri, Bata are its major tributaries. Only a small area in the southeast is drained by river Markanda of the Ghaggar river basin. Giri River practically bisects the district in to two parts, namely trans Giri area and cis-Giri area. Paonta valley is drained by river Bata, a tributary of Yamuna.




INDIA
HIMACHAL PRADESH
DISTRICT SIRMAUR
KILOMETRES
5 0 5 10 15
SHIMLA DISTRICT
SOLAN DISTRICT
HARYANA
UTTARAKHAND
U.P.
RAJGARH
NOHRA
RONHAT
PACHHAD (SARAHAN)
RENUKA (SANGRAH)
SHALAI
DADAHU
KAMRAU
NAHAN
PAONTA SAHIB
River Giri
River Basari
River Jalal
River Tons
River Nera
River Yamuna
Baka Nadi
R. Markanda
NH 72
SH 1
SH 2
SH 6
SH 9
To Rohru
To Chaupal
To Tikari
To Dehra Dun
To Jagadhari
From Kumarhatti
From Solan
From Ambala
From Sadhaura
U.P. . . . UTTAR PRADESH
BOUNDARY, STATE
" DISTRICT
" TAHSIL/SUB-TAHSIL
DISTRICT HEADQUARTERS
TAHSIL/SUB-TAHSIL HEADQUARTERS
NATIONAL HIGHWAY
STATE HIGHWAY
IMPORTANT METALLED ROAD
RIVER AND KHAD
TOWNS
TOTAL AREA . . . . . 2825 Sq.Kms
NUMBER OF TAHSIL/ SUB-TAHSILS . . . . . 10
NUMBER OF TOWNS . . . 3
NUMBER OF VILLAGES . . . 976
Where the name of Tahsil/Sub-Tahsil differs from its Headquarters name, the latter is given in the brackets.
District Headquarters is also Tahsil Headquarters.

# 4 GEOLOGY OF THE DISTRICT

District Sirmaur forms part of the Shiwalik and Lesser Himalaya ranges and it exhibits a rugged mountainous terrain with moderate relief. The rocks found in the area comprise sandstone, shale, limestone and schist deposited during the past 600 million years.

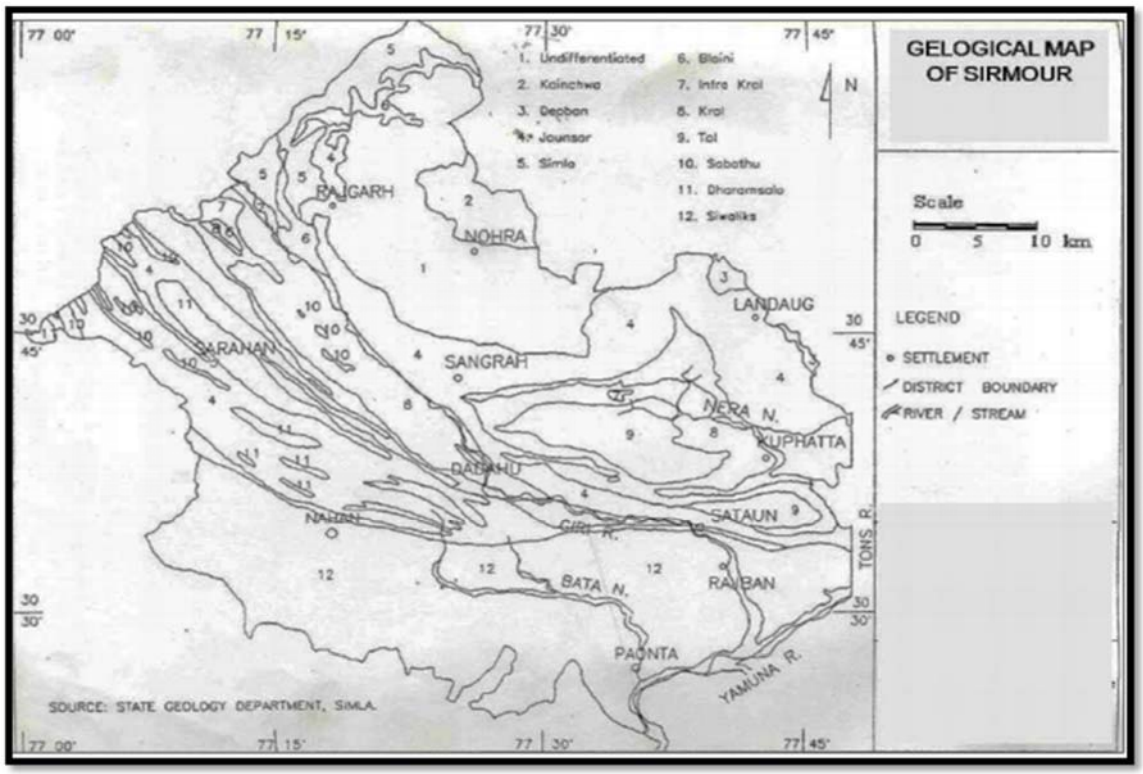
Various litho-units ranging from Proterozoic to recent era are found to occur in Sirmaur district. Among all, typical Mesozoic era formations cover most of the parts and Quaternary formations occupy the southern part of the district. Granite Gneisses of Jatogh Formation belonging to lower Proterozoic is located in the northern part of the district while Deoban Formation of upper Proterozoic is confined to the eastern part in a limited extent. Jaunsar and Simla Group of lower Proterozoic to upper Proterozoic period cover middle portion of the district which encircles Tal, Krol and Infra-Krol formation of Triassic period respectively. Among which the Krol Formation of Triassic period is known for its limestone deposits. Subathu and Dharamshala Formation of Oligocene cover a major portion of the southern area.

Main boundary fault of the Himalayas, extending from Indus to Brahmputra, runs through the south-central portion of the district. The major tectonic break here is called Nahan thrust, and along this fault plane the older rocks rest on the younger Shiwalik rocks. A marked plane of structural discordance exists as a district linear feature between the Nahans (Lower Shiwalik) to the south and the older Tertiary (Subathu-Dagshai group of rocks) to its north.

The Pre-tertiary limestone deposits (Sataun Formation), where exposed, occurs as discontinued lensoid outcrop along the northern fringes of the Nahan thrust and sandwiched in between the Nahan and the Subathu. Generally, all the Formations trend in WNW-ESE direction with moderate to high northerly dip.

Generalised Stratigraphic Successions of the district is given in the following table:

| *Era* | *Period* | *Formation* | *Lithology* |
|---|---|---|---|
| Quaternary | Recent to Pleistocene | Alluvium /valley fills/ Older alluvium | Sand with pebble and clay & multiple cyclic sequence of medium to coarse grained sand with pebble of sandstone and lenses of clay |
| Tertiary | Pliocene – M-Miocene | Siwalik Group | Sandstone, shale, conglomerate, mudstone, clay, gravel & boulder beds beds |
| | L-Miocene – Oligo-Eocen | Kasauli/Dagshai/ Subathu | Grey, purple sandstone, Shale, nodular clay, Shale, Limestone etc. |
| Pre-Tertiary Group | Pemo Carboniferous | Karol/ Infra-Karol, Blainis boulder beds | Limestone, shale, red shale Carbonaceous shale, slate, greywacke, dolomitic limestone. |
| | Devonian | Jaunsar series | Slates schist phyllite, |
| | Pre-Cambrian | Chail series | Slates called Shimla slates |
| | Achaean | Jutogh series | Quartzites, schist and limestone. |


GELOGICAL MAP OF SIRMOUR
1. Undifferentiated
2. Kainchwa
3. Deoban
4. Jounsar
5. Simla
6. Blaini
7. Infra Krol
8. Krol
9. Tal
10. Sabathu
11. Dharamsala
12. Siwaliks
N
Scale
0 5 10 km
LEGEND
SETTLEMENT
DISTRICT BOUNDARY
RIVER / STREAM
RAJGARH
NOHRA
LANDAUG
SARAHAN
SANGRAH
NERA N.
KUPHATTA
DARAHU
NAHAN
GIRI R.
SATAUN
TONS R.
BATA N.
RAIBAN
PAONTA
YAMUNA R.
SOURCE: STATE GEOLOGY DEPARTMENT, SIMLA.
77 00'
77 15'
77 30'
77 45'
30 45'
30 30'

# 5 DRAINAGE AND IRRIGATION PATTERN

Located on the southern most portion of the Himachal Pradesh, Sirmour district borders with Haryana State in the south and in the east with the Uttrakhand. The district lies between 30°22'30" to 31°01'20" north latitude and 77°01'12" to 77°49'40" east longitude. The district is bounded by Shimla district in the North, the river Tons and Yamuna in the East, Ambala District of Haryana in the South-West and Solan district in the North-West.

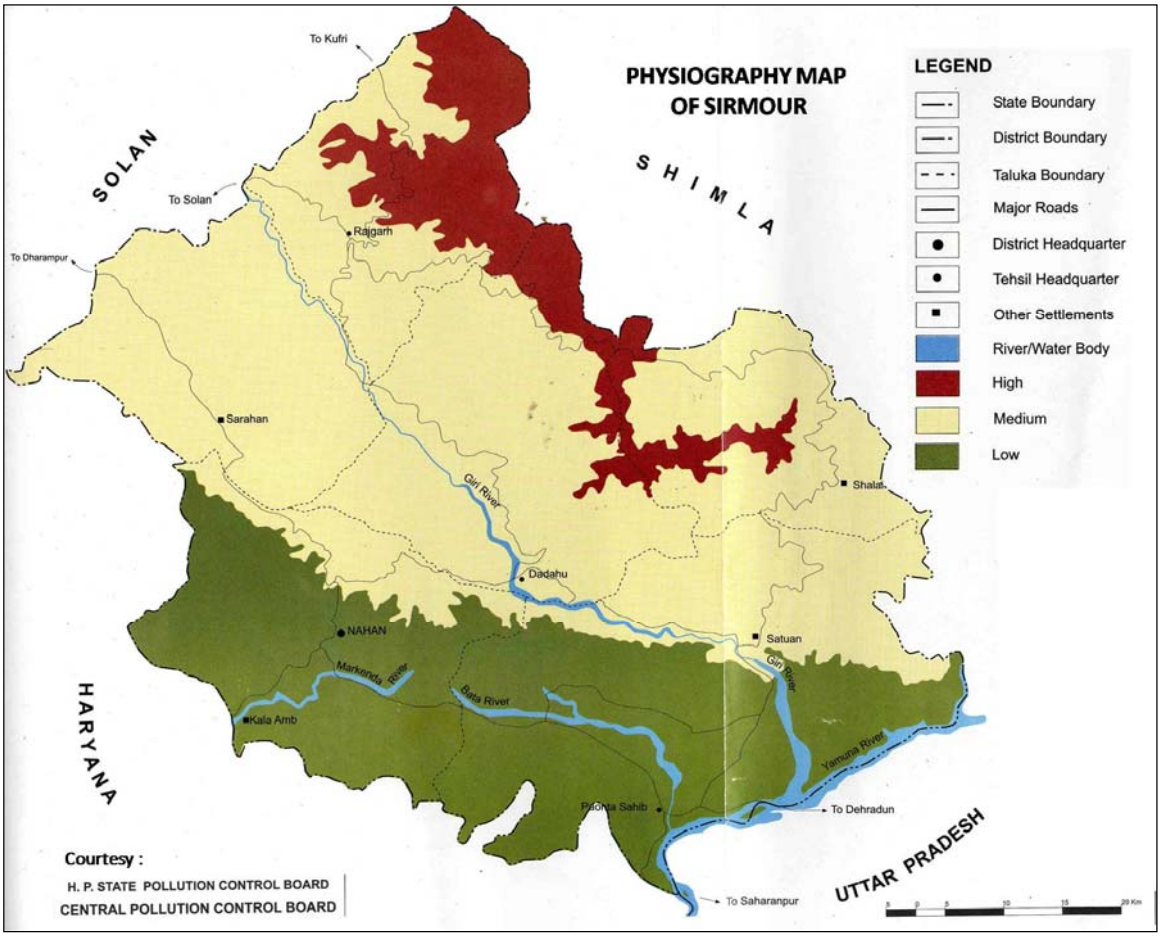
The area in general is the part of the lesser Himalaya and predominantly mountainous (except Dun Valley called as Kiar-da-dun in Tehsil Paonta Sahib) with deep valleys lying between ranges of varying elevation from 400m. towards South East to 3640m. toward North.

Broadly speaking the district is hexagonal in shape with longest length from west to east being 77 km. and maximum width from north to south being 80 km. Geographically the district can be divided into three parts.

1. The Trans –Giri (Giri Par Region) (46% of the total area)
2. The Cis –Giri (Giri War Region)
3. Plains of Kiar-da-dun or Dun Valley

The Trans –Giri (Giri Par Region)consist of high mountains culminating into Chur Peak with altitude of 3647 mtrs. From this lofty mountains, run two ranges, one in north west and other south west direction toward Haripurdhar. The second range agains deivdes into two, one which run almost east of the river Tons and the other range run south east under the name of Dhar Nigali and then turns east under the name Dhar Kamru. The Dhar Shillai run parallel to this in northern side and these two form the valley of Naira nallah which ultimately fall in the tons river.

The Cis –Giri (Giri War Region) is intersected by three main ranges which run from north-west to south-east. Of them, first is the Sain Dhar which runs parallel to the river Giri and second is the Dharthi Dhar. Between these to Dhar flows river Jalal. The third is quite a low range, which runs from around Kala Amb (to the south of Nahan) and forms an open valley with Dharthi Dhar. In the western half of this range flows the markanda river. Between the eastern extreme of the Dharthi range lies open wide valleyknown as Kiar-da-dun or Dun Valley, which borders the Yamuna and Giri river in the east and form the boundary of the district with the Uttrakhand. It also touches western portion of Tehsil Nahan. This flat valley is irrigated by the Bata river which flows from east to west originating from Dharthi ranges.




The District Sirmour is drained by the Giri, Tons, Bata, Markanda, Ghaggar and Somb Rivers . The Percentage of area shared by these streams is as below:

| Name of the river | Area drained (in Sq. Km) | %age of the area drained |
|---|---|---|
| River Giri | 1482 | 52.45 |
| River Tons | 430 | 15.21 |
| River Bata | 335 | 11.88 |
| River Markanda | 318 | 11.25 |
| River Ghaggar | 116 | 4.13 |
| Somb Nallah | 144 | 5.08 |

YAMUNA

This river originates from the Jamnotri mountain in the Himalayas at a height of about 7,924 m from the mean sea level. After crossing through Garhwal and irrigating Jaunsar area, it flows on the eastern boundary of the district for a distance of about 31 km. Entering at village Khodar Majri and leaving at Kaunch and continues in the Uttrakhand. It separates Kayarda Dun from the Dehradun and forms the boundary line between this district and the Utter Pradesh. Within the boundary of this district the estimated maximum width of the river is about 91m and the depth is about 6m, but this limit is far exceeded during the rainy season. In the summer, due to melting of snow on the mountains, the volume of water of the river is often subject to variation. The water of this river is generally cold and clear but during the summer, due to melting of snow, it becomes somewhat muddy. It is a sacred river

having two temples on its bank, at Rampur and at Paonta where a Gurudwara also exists. Since this river flows at a lower level than of the plateau of the Kayarda Dun, its water cannot be made use of for irrigating the area. It consists tributaries in the district i.e. the Tons meeting it at Khodari Majri, the Giri Joining it near Rampur Ghat and the Bata mingling its water with it at Bata Mandi.

The river Yamuna is the primary tributary of the river ganga, originates from the Yamounotri Glacier near Banderpoonch peak( 38o 59'N78o27'E) at an elevation about 6387 mtrs.in district uttrakashi. The Yamuna catchment drain the Punjab-Kinmaon Himalayas from Shimla in northwest to Musoorie in the south east. After flowing in southeasterly direction for about 120 kms it is joined by its principal tributary the Tons near Dakpathar. The Tons drain a large catchment area hence carries a large volume of water than the main river Yamuna. From the west another important tributary, the Giri joins the main river near the Paonta Sahib. The river pierces the lower Shiwalik range and enters the plains near Tajewala. From Tajewala onward it flows in a southerly direction for a distance of 240 kms upto the Okhla head water near Delhi. The Yamuna after receiving the water through other important tributaries joins the river Ganga and the underground Saraswati at Prayag (Allahbad) after traversing about 950 kms.

The catchment of the Yamuna river system covers part of Uttar Pradesh, Uttrakhand, Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh, and Delhi states. The state wise catchment area distribution is as below.

| Name of the state | Total catchment area in Yamuna(in Sq. Km) | Percentage contribution. |
|---|---|---|
| Uttar Pradesh (including Uttrakhand) | 74208 | 21.5 |
| Himachal Pradesh | 5799 | 1.6 |
| Haryana | 21265 | 6.5 |
| Rajasthan | 102883 | 29.8 |
| Madhya Pradesh | 14028 | 40.6 |
| Delhi | 1485 | 0.4 |

The tributaries contribute 70.9% of the catchment area and balance 29.1 % accounted for the direct drainage into the Yamuna river or to the smaller tributaries. On the basis of area, the catchment basin of the Yamuna account to 40.2% of the Ganga basin and 10.7% of the total land mass of the country.

GIRI

By far the greater portion of the district is drained by the river Giri or its tributaries. The river Giri originates near Kharapathar in Jubbal Tehsil of the district Shimla at hight of about 3270 mtrs. It through the hills of Kot-Khai and Tatesh, parts of Shimla district, and enters in the district on its south-west side. It continues its course for about 40 kms., forming the boundary with the Keonthal area of the Shimla district. At village Mandoplasa, this district and debouches in the Yamuna at Rampur Ghat

None of its tributaries are important, except, on its right bank, the Jalal, which joins it at Dadahu below Sati Bagh at the souther-eastrn extremity of the Sain Dhar. On its left bank the principal streams are the Nait and Palar, which rise on the Kawal, a stream which first flows westward, till it falls into the Giri. Other tributaries are the Bajhethi, the Pervi, the Khal and the Joggar streams.

Tons

The source of this river lies in the Jamnotri mountains and after coursing through the territories of Jubbal and Jaunsar it enters the district near village Kot separating it from the Jannsar area, once a

part of the ers while princely state of Sirmour. After flowing for about 50km and forming the eastern boundary of the district it joins the Yamuna near Khodar Majri, too soon losing its name in that of the Yamuna, which is trebled in size after the junction of the two rivers. When it issues from its bed of snow at an elevation of about 3,897 m. above the level of the sea, it flows in a grand volume, 9m wide and 9m deep maintaining its dignity of character until its confluence with the river, which should, if rivers had their just rights, have been considered its tributary. During its comparatively short career, the Tons receives into its bosom the water of several other beautiful streams. The current of this river is swift and the course full of 17tones.

### Jalal

This small, shallow and narrow river rises near village Bani below Nehi in tehsil Pachhad and forms a dividing line between the Sain and the Dharthi. At Dadahu in SubTehsil, it falls into the Giri river losing its name. It is generally fordable and rarely up-passable except when it floods which passes away soon.

### Markanda

It rises at Baraban in the hills of Katasan and pass below a temple of Katasan Devi. After flowing from south-east to south-west for a distance of about 24 km. With in the district, irrigating Bajora area, it passes on to the Ambala district at Kala Amb where it is quite wide at village Dewani it is joined by a streamlet named Salani. Areas of Bajora, Kala Amb the lands of Shambhuwala, Rukhri and the garden of Bir Bikrambag and the Khadar Bag are irrigated by its water and few water mills are also run. Its only tributary, of any importance, is the Salani.

### Bata

This river issues from Siori spring in the Dharthi range, located in village Bagna tehsil Nahan and takes easterly direction reverse to the course of the Markanda. Dividing Kayarda Dun into two parts it joins Yamuna at Bata Mandi and loses its separate entity and name. Dun area is irrigated by its water. It is a perennial stream subject to heavy floods in the rainy season, though usually for badable.

### Ghaggar

This river is mentionable not because it is one of the main or principal water bodies of the area but simply for the reasons that it rises near Lawasa in this district. It flows in the westerly direction and whole of southern slope of Dharthi Dhar up to Lawasa drains into this river. It flows for about 12.8 km. in Pachhad tehsil of this district before it enters the Haryana near Prit Nagar. Before it collects water sufficient to make it a river has already crossed the limits of the district. It is only two main tributaries, eg. the Lah which runs through Ghinni tract and Deh which drains the Ghar portion of the Ponwala Jagir. Near its source and for a number of kilometers further on it has a well-defined boulder strewn bed which is never dry but while coursing in the plains the quantity of water diminishers to a mere thread and finally it loses itself in Bikaner territory near Hanumangarh formerly called Bhatnair.

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Table: Area of district Sirmour being drained by various rivers/nallah.

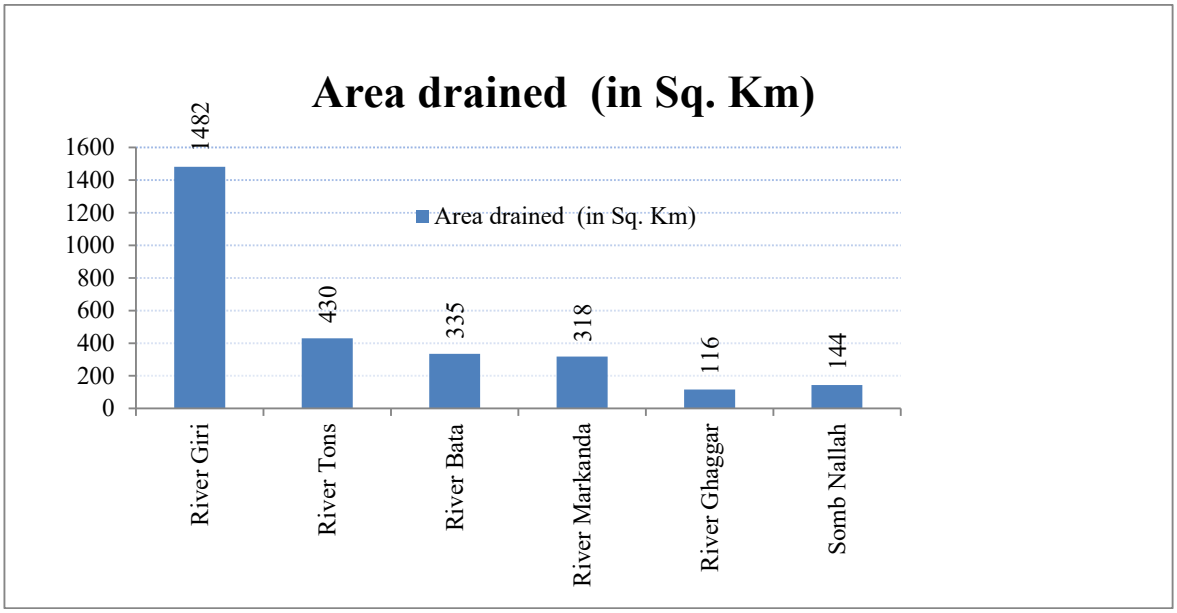



Chart showing Area of district Sirmour being drained by different streams

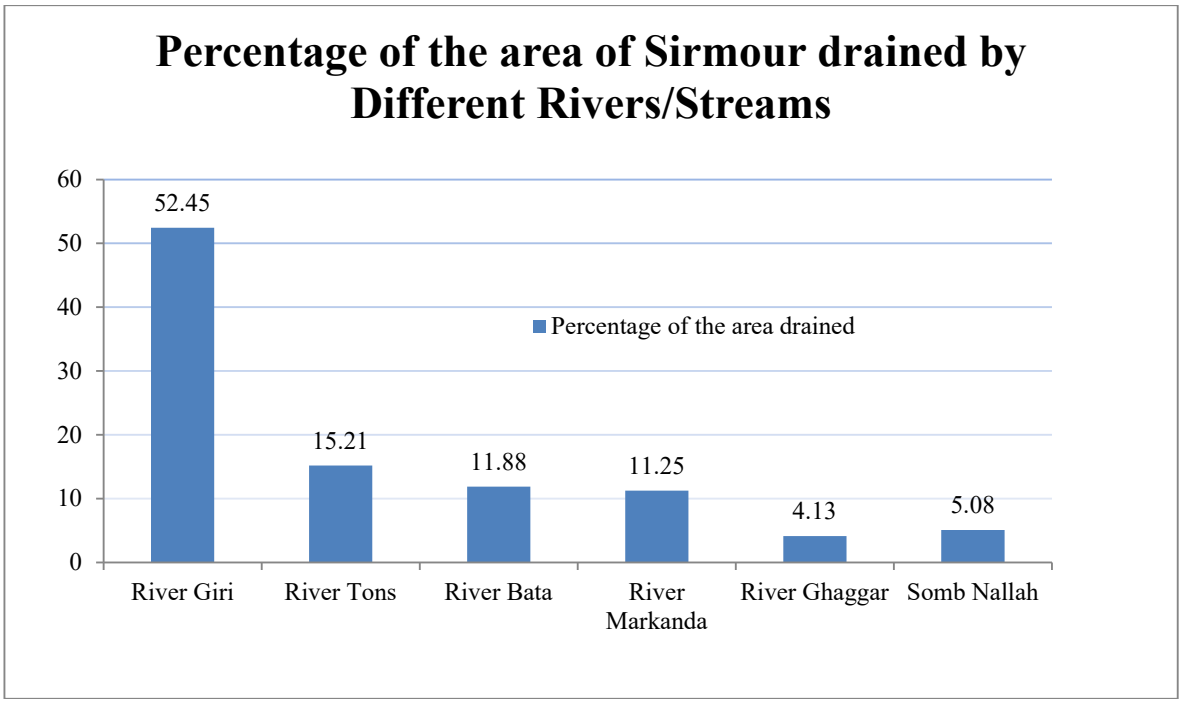



Chart showing Percentage of Area being drained by different streams

Process of Deposition of Sediments in the River Bed

Deposition is the opposite of erosion. Deposition is where a river lays down or drops the sediments or material that it is carrying. Rivers carries lots of different sediments, including rocks, boulders, silt, mud, pebbles and stonnes. Normally, a river has the power to carry sediments. If the force of a river drops, the river cannot carry sediment. This is when the river deposits its sediment.

## Constituents of minor mineral

The work done by a river consists of the following

1) Erosion
2) Transport of the material produced by erosion
3) Accumulation (deposition) of the transported material

The erosion and transport of material go hand in hand with the deposition of the latter. There is not a single river that doesn't carry fragmental material and deposit it. Even at the early stages, in the development of a river, when the erosion and transport definitely prevail over accumulation, the material carried by the river is deposited in some of the sections. During youthful stage of the river, these deposits are unstable and when the volume of water and stream velocity increases (during flood), they may start moving again downstream. The load carried by a stream includes the rock waste supplied to it by rain wash, surface creep, slumping etc. by tributaries, external agents such as glaciers, wind, together with, acquired by its own erosion work. The term load doesn't specifically mean the maximum amount of debris, that a stream could carry in a given set of conditions, that amount is referred to as the transporting power or capacity of a river. The term load is technically defined as the total weight of solid detritus transported in unit time. The transporting capacity of a stream rises very rapidly as the discharge and the velocity increases. Experiments show that with debris of mixed shapes and sizes, the maximum load that can be carried is proportional to something between the third and fourth power of the velocity. But the fragments of a given shape, the largest size that can be moved (not the actual mass of mixed debris) is proportional to the sixth power of the velocity, provided of course that the depth of water is also adequate for the purpose. As the velocity of a river is checked, the bed load s first to come to rest with continued slackening of the flow, the larger ingredients of the suspended load are dropped, followed successively by finer and finer particles. When the stream begins to flow more vigoroussly, the finer materials are the first to move again. A river begins to sort out its load or burden as soon as it receives it. The proportion of fine to coarse amongst the deposited materials tend on average to increase downstream, but there may be interruptions of this tendency because of addition of coarse debris from tributaries or from landslides and steepening of the banks.

Both discharge and load depend on the climate and geology (litholgy, structure and relief) of the river basin concerned and both co-operate in carving out the channels down.

<table>
<tr><td rowspan="2">Size</td><td colspan="2">Rounded, Subrounded, Subangular</td></tr>
<tr><td colspan="2">Fragment</td><td>Aggregate</td></tr>
<tr><td></td><td>Boulder</td><td>“ Roundst one”</td><td>Boulder gravel Boulder conglomerate</td></tr>
</table>

| | | | |
|---|---|---|---|
| 256 mm-- | Cobble | | Cobble gravel Cobble conglomerate |
| 128 mm- | Pebble | | Pebble gravel Pebble conglomerate |
| 64-10mm- | Granule | | Granule gravel |
| 6-2 mm-- | Sand | | Sand<br>Sandstone |
| <2 mm-- | Silt | | Silt<br>Siltstone |
| | Clay | | Clay<br>Shale |

General Geo-morphological Characteristics of Rivers/Streams

(i) Transport of Sediment by Streams and Rivers

The material transported by a stream can travel as:
Bed load
Suspended load
Dissolved load (salts, chemicals

(ii) Stream capacity

Maximum quantity of solid material that a stream can carry
Related to velocity (discharge)
Higher after a rain (more sediment in water
Stream competence (or competency)
Measure of the maximum size of particles the stream can transport
Predict erosive capabilities

Types of rivers or streams

Meandering
These streams are very sinuous, and tend to migrate back and forth across the floodplain (or meander), over time. The word "meander" comes from the name of a sinuous river in Turkey, named the Menderes.

Braided

These streams have lots of lenticular-shaped in-channel bars. The stream channel bifurcates around these bars, and follows a pattern resembling braided hair.

## Fluvial Geomorphology

Erosion is the set of all processes by which soil and rock are loosened and moved downhill or downslope. The most important process of erosion is due to running water. Erosion by running water acts in two basic forms: overland flow and channel flow.

## Splash Erosion

Most running water starts off as rain. Rain drops have diameters of between 0.5 to 7 mm and hit the ground at between 1 - 9 m/sec. The force of the impact loosens material and throws it into the air. This is called splash erosion. In violent thunderstorms over 200 tonnes/hectare can be disturbed. On a sloping surface, soil is shifted downhill as grains are moved slightly greater distances downhill than uphill. More importantly, however, it leads to a decrease in the permeability of the surface due to openings being sealed by particles. There is therefore less infiltration and an increase in overland flow

## Overland Flow

Runoff starts as a broad sheet. The sheet exerts a drag force over the ground surface and some weathered products may be removed. This is sheet erosion. Generally, after traveling a short distance, small channels or rills are formed, which coalesce into gullies, concentrating the erosive action.
The amount of erosion of a slope depends on the
Length and steepness of the slope
Rainfall intensity
Permeability and structure of the surface
Amount of vegetation cover.

## Channel Flow

Stream erosion is "the progressive removal of mineral matter from the surfaces of a stream channel which itself may consist of bedrock or regolith" (Strahler). Erosion will only occur when the stream has an excess of energy. In mountainous streams, the rough channel walls may amount to 96% of the potential energy of the stream. Some energy is also spent in transporting load previously acquired. Erosion will result if the energy available > cohesion of particles.

The quantity of water passing through the channel is termed the discharge (m2/sec) and is equal to the channel cross-sectional area (m2) times the average stream velocity (m/sec).
The amount of sediment carried by the stream is called the stream load (kg/m3)

## Sub-processes of erosion

### a. Hydraulic Action

- The force of the running water alone. This is very important in weak alluvial deposits, especially in times of flood, when fast flowing; turbulent water undermines the channel banks.

### b. Abrasion

- the scouring caused by the impact of rock particles that are being transported. Abrasion features include plunge pools, potholes and chutes. Abrasion is proportional to velocity2, so a three-fold increase in velocity leads to nine times as much abrasion. The mutual erosion of two particles is known as attrition

c. Solution (Corrosion)
- chemical reactions between ions in solution and exposed minerals. It is particularly important in limestone areas or on beds of rock salt and gypsum, but all common minerals are soluble to some extent.

## Stream Velocity

Stream velocity can be estimated from Manning's equation

$$V = \frac{1}{n}\left(\frac{A}{P}\right)^{\frac{2}{3}} S^{\frac{1}{2}}$$

Where A = cross-sectional area, P = wetted perimeter, S = slope and n = roughness coefficient. The value of n will vary from around 0.02 for a smooth channel to 0.03 for rough gravel. Other factors such as surface irregularities, changes in cross-section, obstructions, vegetation and degree of meandering will also affect the roughness coefficient. In general, as you go downstream, the slope decreases (lowers velocity) and n decreases (raises velocity). At any point along the stream's course, an increase in the depth of the stream's channel (e.g. during floods) will lead to an increase in A/P, with a consequent increase in velocity.

## Erosion Velocities

The easiest grains to erode are in the fine to medium sand size range (see figure 1). Particles greater than this size have a proportionally greater volume to surface area ratio, so are harder to erode. For clays, ionic bonding leads to increased cohesion between clay particles, making them harder to erode. Clays are also platy minerals and form smooth surfaces. Laminar flow over the smooth surface decreases the ability of the stream to erode the particles. Clays also infill between larger grains and so are protected by the larger grains. Sands, therefore, may be moved during "normal" river flow, but it is only when floods increase the stream's velocity that the larger and smaller particles can be moved. Once the particles are being transported, there is an orderly deposition of particles with the largest being deposited first and clays being held almost indefinitely. Hence the sediment becomes sorted downstream.

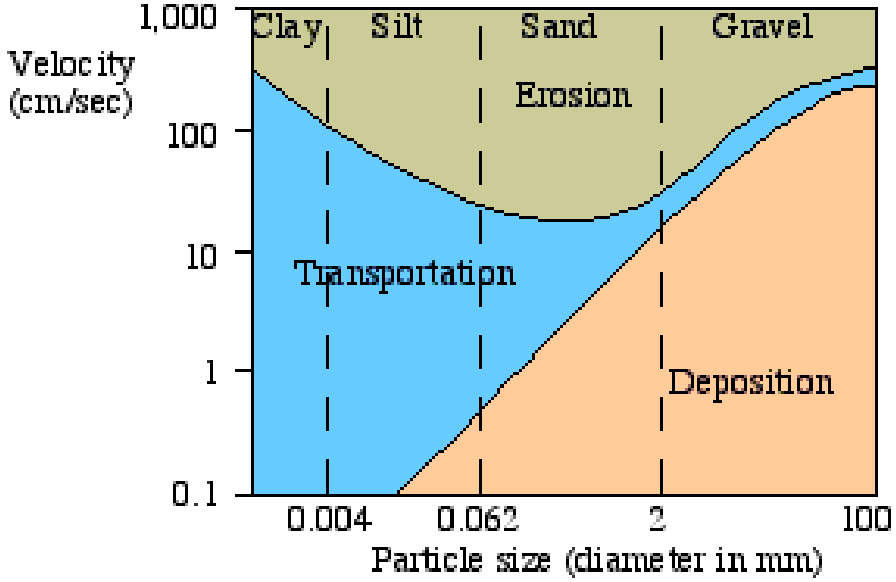



Figure 1. Diagram showing the stream velocity required to erode, transport and deposit particles of various sizes.

Transportation

The particles carried by streams is known as the stream load. Particles may be carried by
Floatation. Of very minor significance.

Solution. Ions of dissolved minerals that may travel downstream indefinitely. The most common are Na, Ca, K, Mg, Cl, SO4 and HCO3. One estimate of U.S. Rivers was that they carry 300 million tonnes of dissolved load each year, and 250 million tonnes of solid load.

Suspension. The temporary support of particles when turbulence is greater than the settling velocity of the particle. Clay and silt are normally transported in suspension, but sand may be carried this way in floods.
Saltation. Intermittent "jumping" of grains that are lifted by turbulence, but are too heavy to remain in suspension.
Traction. The sliding or rolling of particles along the stream floor. Particles moved in this way comprise the bed load. Bed load normally constitutes around 10% of the solid load, but may be up to 50% during floods, when the major work of the stream is done.

Transportation is aided by the buoyancy of water, e.g. quartz grains are Å 2000 times the density of air, but only two and a half times that of water. Unequal velocities at the top and bottom of boulders also assist transportation, as does steep gradients.

The total load of particles of all sizes that a stream can carry is known as its capacity. It is proportional to discharge, which is proportional to velocity. A faster flowing stream therefore has a higher capacity. If a stream's capacity is less than its load, the stream cannot carry its load, so deposition occurs. If capacity exceeds load, the stream has excess energy (gravitational, potential energy), so it can erode more sediments. Streams switch back and forth from depositional to erosional agents, depending on load vs. capacity. A stream can erode along one stretch and deposit along another, since gradient and channel shape/size vary along the stream's course. Streams can erode during periods of higher velocity or discharge (floods) and deposit during periods of lower velocity or discharge. Anything that alters the sediment load delivered to the channel or that alters the stream's capacity to carry that load will cause the stream's gradient or channel geometry to change in response

The largest particle that a stream can transport is known as its competency. Assuming that there is sufficient depth to cover the particles, then competence is proportional to the square of velocity.

## Deposition

Deposition will occur when a loss of energy results in a decrease in velocity. This may be due to such things as declining gradient, a decrease in water volume, an increase in cross-sectional area (particularly pools, lakes, and oceans), or by local obstructions. An excessive load produced by increased erosion in the drainage basin or tributary valleys, or from glaciofluvial outwash will also inevitably lead to deposition. The accumulations of stream deposits are called alluvium.

Note: There is a constant interaction between erosion, transportation and deposition. During a flood, the bed of a stream at a particular point may be eroded, but as the flood subsides the bed is filled again. Similarly, in different parts of the stream, velocity differs and hence one part of the stream may be eroding its bank, while on the opposite bank deposition is taking place.

## Downstream Adjustments

Overall, despite some variations, effluent streams (those that receive water from the water table) generally show the following changes downstream:

discharge increases (due to more tributaries and a greater drainage area)
total load increases (due to more tributaries and a greater drainage area)
channel size increases (to cope with the increased discharge and load)
particle size decreases (due to increased abrasion/attrition and changes in velocity)
the smoothness of the channel increases (due to decreased particle size)
gradient decreases
Stream velocity downstream is increased by the smoother channels, but decreased by lower gradients. Under normal conditions, velocity is proportional to discharge0.1, so there is a slight overall increase in the average velocity of the stream - despite the appearance of faster flowing mountain streams at the headwaters. In such streams, the amount of turbulence and associated eddies and backward flowing portions of the streams means that the average velocity is lower than the smoother flowing waters downstream. During floods, however, when the major work of the stream is done, velocity is proportional to discharge0 (i.e. it is constant), so the increased velocity associated with floods allows the erosion and transportation of a large range of particle sizes throughout the drainage system.

It can be seen from these relationships that peak discharge conditions that occur during floods are very important in determining the form of rivers and the features associated with them, and not the "normal" river level.

These changes take place in an orderly manner and lead to a longitudinal profile that is smooth and concave. This is known as a graded profile (see Figure 2 and Chernicoff & Whitney, fig, 14-7, pg 438).

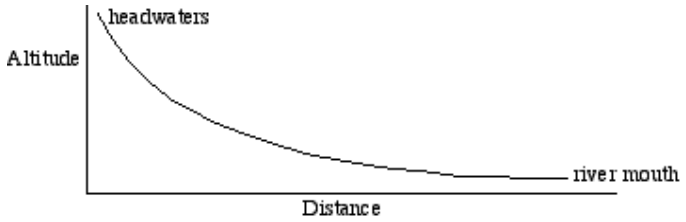



Figure 2. Long profile of a graded stream, showing a regular change in gradient.

For a stream with an irregular profile, erosion will be more pronounced at places of higher than normal gradient, such as at falls and rapids, and sedimentation will occur in areas of low gradient, such as lakes. The "bumps" are therefore ironed out until the graded profile is achieved.

Over geological time, providing that tectonic forces do not change the base level, any stream, irrespective of length, discharge, and bedrock, will achieve such a state of "dynamic equilibrium".

It is a "dynamic" system, as there is constant re-adjustment of the channel in response to local variations in the volume, velocity and load, that leads to a local balance between the sediment being transported and the energy available. That is, short term changes of scour and fill may occur, but in the long term the gradient and velocity are such that the available load can be transported without erosion or deposition dominating in any particular place. Over geological time, erosion dominates and the whole profile is lowered until a peneplain is developed close to base level. The base level is the lowest level that a stream can erode its channel. A temporary base level results from obstructions such as resistant outcrops, lakes, dams etc. that lead to temporary sub-profiles

An increase in base level will lead to aggradations, the built up of sediment on valley floors and the development of thick deposits of alluvium.

A decrease in base level will lead to such things as nick points that migrate upstream, alluvial terraces, valley in valley topography and entrenched meanders.

The rise in sea level from 18,000 to 10,000 years ago means that most present river systems don't demonstrate ultimate base level control by modern sea level. Estuaries (in streams with minor solid loads) and deltas (large loads) demonstrate adaptations to the changed conditions.

Salient Features of Important Rivers and Streams

| Sr. No. | Name of the River/Stream | Total Length in Sirmour (in Km) | Place of Origin | Altitude at Origin (in Metre) |
|---|---|---|---|---|
| 1 | Yamuna | 31 | Yamounotri Glacier | 6387 |
| 2 | Giri | 109 | Kharapathar in Jubbal | 3270 |
| 3 | Jalal | 39 | Sainki Dhar Near Village Barno | 1868 |
| 4 | Bata | 36 | Daghera RF | 1460 |
| 5 | Nera | 26.8 | Juni Dhar | 2450 |
| 6 | Tons | 48.6 | Yamounotri Glacier | 6387 |
| 7 | Markanda | 27.6 | Simbhwala Dhar Near Vilage Santhal | 1390 |
| 8 | Trilokpur Nadi | 9.8 | Kaluwala Ki Dhar | 590 |
| 9 | Salauni Ki Nadi | 18.2 | Near Village Shilli Sinari | 1150 |
| 10 | Run Nadi | 21.4 | Dharti Dhar | 1290 |
| 11 | Kandiwala Ki Nadi | 12.8 | Kangu Ki Dhar | 1282 |
| 12 | Kairi Ka Khala | 6.6 | Khairwala RF | 650 |
| 13 | Somb Nadi | 9.3 | Nagiwala RF | 636 |
| 14 | Lohgarh Ka Khol | 9.8 | LohGarh RF | 655 |
| 15 | Nimbuwala Khala | 15.5 | Garuk RF | 635 |
| 16 | Matar Ki Khol | 7.9 | Brahmanwala RF | 648 |
| 17 | Jagat Ka Nala | 20.6 | Dawai Dhar | 2462 |
| 18 | Katli Ki Nadi | 5.2 | Simbhwala Dhar Near Vilage Santhal | 1390 |
| 19 | Sudanwala Khala | 6.4 | Sudanwala RF | 655 |
| 20 | Gumti Nadi | 13.4 | Gumti Sambhalwa RF | 620 |
| 21 | Dholi Rao Khalla | 8.0 | Gorasa | 650 |

Methodology adopted for calculation of Mineral Potential:

The mineral potentials have been calculated based on field investigations and geology of the catchment area of the river/streams. It is also important to mention here that the there is a provision in the River/Stream Bed Mining Policy Guidelines where collection of material upto a depth of one meter is allowed in a single season where mineral concession have been granted. As per the provision in the River/Stream Bed Mining Policy Guidelines, only 60% of the area of the particular river/stream bed has been taken into account for calculation of mineral potential. It is noticed that during flood season whole of the pits so excavated is completely filled up and as such the excavated area is replenished with new harvest of mineral. No change in river profile is noticed in the past few years. Mineral constituents like boulder, river borne bajri, sand upto a depth of one metre is considered as resource mineral. Other constituents like clay and silt are exclude as waste while calculating the mineral potential of particular river/stream. The specific gravity of each mineral constituents is different. While calculating the mineral potential, the average specific gravity is taken as 2.25. The percentage of mineral constituents like boulder, river borne bajri, sand is also varies for different river/stream. While calculating the mineral

potential the percentage of each mineral constituents is taken as, 35-40% for Boulder, 30-35% for river born Bajri, 25-30% for sand and 5-15% for silt and clay.

The deposition in river beds is more pronounced during rainy season. Although the quantum of deposition is varies from stream to stream depending upon numbers of factors such as catchment lithology, discharge, river profile and geomorphology of the river course. However, there are certain geomorphological features developed in the river beds such as channel bars, point bars etc. where annual deposition is much more even two to three metres. The annual deposition of minor mineral in the different river/stream beds has been calculated on the basis of field investigations and geology of the catchment area of the river/streams. The rate of annual deposition of minor mineral in the different river/stream beds of district Sirmour varies from 5 cm to 30 cm.

Description of Rivers/Streams

Yamuna (Toposheet No. 53F/11 and 53F/15 )
General

Yamuna river is one of the major tributaries of the Ganga river system. This river originates from the Jamnotri mountain in the Himalayas at a height of about 6387 m from the mean sea level. Drainage pattern of the Yamuna river is of Dendritic type. Total length of Yamuna river in Himachal Pradesh is about 31 Km and the total catchment of this area is approx. 270 Sq. Km.

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Confluence with Tons River to Behral near Haryana and Uttar Pradesh Border | 31 | 478 | 14818000 | 20004300 |

Present status of mining.

Presently there are 16 mining leases has been granted in Yamuna River. Out of these, 1 number of mining lease for extraction of minor mineral for Open sale, 2 numbers of auctioned quarries and 13 numbers of mining leases have been granted for running the stone crushers. The detail is as under:

For Open sale

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | Shri Manjeet Singh R/O House No. 171/11, Devi Nagar, Tehsil Paonta Sahib, District Sirmour, H.P. | 4.2 |
| | Total Area | 4.2 Hect. |

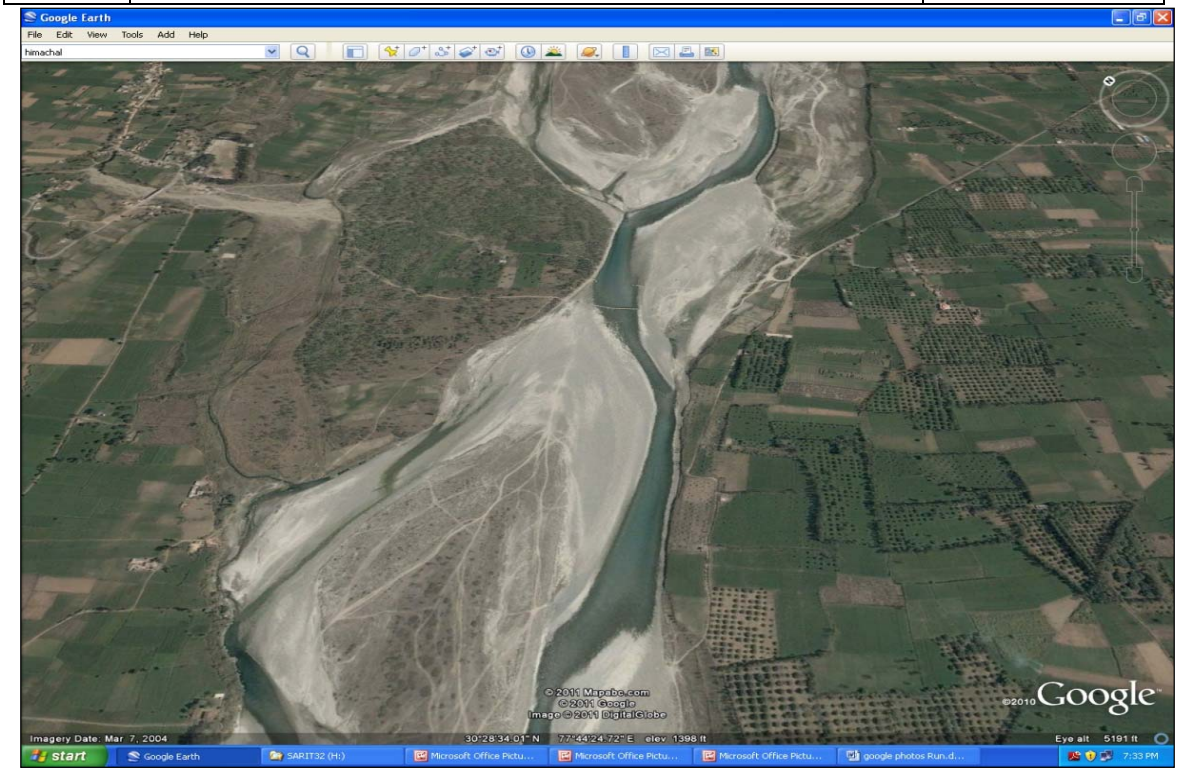
Auctioned Quarries

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | Shri Randeep Singh, S/o Shri Gurbaksh, Village Masruwala, P.O. Dulmana, Tehsil & District Hanumangarh, Rajasthan | 1-10-40 Hect. & 53-56-40 Hect. |
| 2. | Shri Dev Raj Negi, S/o Shri Singha Singh, Village Gojjar, Tehsil Paonta Sahib, District Sirmour, H.P. | 5-37-05 |
| | Total Area | 60-03-85 Hect. |

For stone crusher

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | M/s Sab Giri Industries, Prop. Shri Madan Mohan Sharma, S/o Shri Natha Ram Sharma, H. No. 214, Ward No. 10, Devi Nagar, Tehsil Paonta Sahib, District Sirmour, H.P. | 2.68 |
| 2. | M/s Mahender Singh & Company, Prop: Shri Mahender Singh, S/o Shri Sohan Singh, Devi Nagar, Tehsil Paonta Sahib, District Sirmour H.P. | 10.2 |
| 3. | Smt. Meera Chandel, W/o Dr. Hakam Chand Chandel Devinagar Paonta Sahib distt. Sirmour H.P | 4.7 |
| 4. | M/S Yamuna Mines and Minerals, C/o Sh. Sher Singh Negi Ho. No. 133/E Canal road Heerpur Paonta Sahib Distt. Sirmour H.P | 3.75 |
| 5. | Sh. Anil Sharma Sirmour Industries, Vill. Bata Mandi Teshil Paonta Sahib Distt. Sirmour H.P | 3.52 |
| 6. | Sh. Vivek Gautam, Vill. Manpur Devra Tehsil Paonta Sahib Distt. Sirmour H.P | 2.16 |
| 7. | Sh. Mahabir Singh, Vill. Gojar adain Tehsil Paonta Sahib Distt. Sirmour H.P | 7.2 |
| 8. | Smt. Seema Devi, D/o Shri Ghunger Ram, Prop. M/s Krishna Stone Crusher, R/o Ward No. 8, Mohalla Nalagarh, Tehsil Nalagarh, District Solan, H.P. | 3.75 |
| 9. | M/s Bitta Stone Crusher, (Partnership Firm, Partners S/Shri Salinder Singh, Sarwan Singh, Amarjeet Singh & Smt. Babita Dubey) Village Kunja Matralion, Tehsil Paonta Sahib, District Sirmour, H.P. | 2.05 |
| 10. | M/s Akhilesh Enterprises, Partners Smt. Malini Jung & Kirnesh Jung, Village Ganguwala, PO Batamandi, Tehsil Paonta Sahib, District Sirmour, H.P. | 2.0 |
| 11. | Shri Lakhwinder Singh, S/o Sh. Jagmel Singh, Falt No.824, Phase-2, Mohali, Punjab. | 4.2 |
| 12. | Shri Amrik Singh, Prop. M/s Neelkanth Stone Crusher, Haripur Tohana, Tehsil Paonta Sahib, District Sirmour, H.P. | 3.08 |

| | | |
|---|---|---|
| 13. | M/s Hare Krishna Stone Crusher Prop. Shri Aachman Kapoor, House No. 180/46, Surya Colony, Ward No. 6, Paonta Sahib | 3.51 |
| | Total Area | 52.8 Hect. |




*Upstream google earth view of Yamuna River near Guruwala*

## Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri and sand. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 20%.

Table Showing Minor Mineral Potential and Annual Deposition of Yamuna River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 7001505 | 6001290 | 5001075 | 2000430 | 20004300 |
| Annual Deposition 30% | | | | |

| | | | | |
|---|---|---|---|---|
| 2100451.5 | 1800387 | 1500322.5 | 600129 | 6001290 |

Recommendation

It is evident from the above table that about 20004300 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Yamuna River in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 6001290 metric tonnes. As such 20004300 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the right bank of the river bed from downstream of confluence with Tons River to village Behral near Haryana and Uttar Pradesh Border.

Giri: (Toposheet No. 53F/1, 53F/5, 53F/6, 53F/10 and 53F/11)
General

Giri river is one of the major tributaries of the Yamuna river system. The river Giri originates near Kharapathar in Jubbal Tehsil of the district Shimla at hight of about 3270 mtrs. Drainage pattern of the Giri river is of Dendritic type. Its catchment is stretched between 30°04'30" to 31°15'40" N latitude and 77°00'00" to 77°43'45" E longitude covering an area catchment area of 2600 Sq.Km. which is further divided into 36 Sub-catchments. Its water has been diverted by putting a barrage at Dadahu to generate power at Girinagar and provide irrigation in and around Paonta valley. Keeping in river physics point of view and availability of the minerals, the Giri river can be divided into two portions i.e. upstream of the Dadahu Barrage (Giri-I) and downstream of the Dadahu Barrage (Giri-II).

Present status of Mining

Presently there is 30 numbers of mining leases has been granted in Giri river. Out of these, 3 Nos. of mining leases have been granted for extraction of minor mineral for Open sale and 27 numbers of mining leases have been granted for the stone crusher. The detail is as under:-

For Open Sale

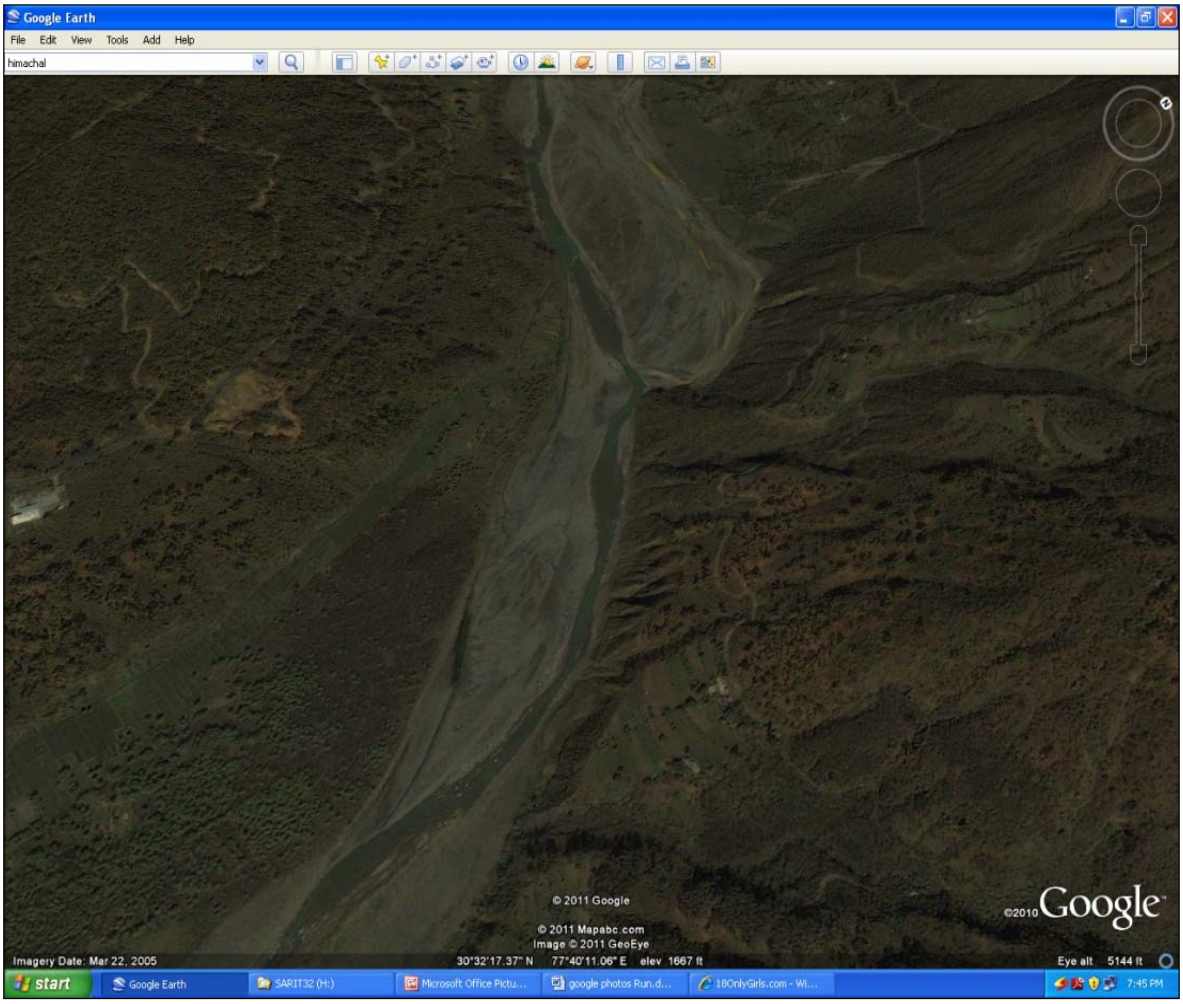
| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | Shri Dalip Singh, S/o Shri Narayan Singh, R/o Village Chandni, P.O. Bharog Baneri, Tehsil Kamrau, District Sirmour, H.P. | 2.11 |
| 2. | M/s A-One Enterprises H. No. 603 Sec-7 Panchkula Haryana | 4.24 |
| 3. | M/s Bala Sundri Mines & Minerals, (Partners S/Shri Manish Kumar, Rishi Kumar & Naveen Kumar) House No. 169/19, Ward No. 5, Yamuna Vihar, Shamsherpur, Tehsil Paonta Sahib, District Sirmour, H.P. | 3.09 |
| | Total Area | 9.44 Hect. |

For Stone Cruhser

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|

| | | |
|---|---|---|
| 1. | Sh. Ashish Kumar S/o Sh. Anand Kumar 186/10 Devinagar Paonta Sahib (H.P) | 18.04 |
| 2. | M/s All Stone Mine & Minerals, Vill. Rampur Ghat, P.O. Shivpur, Teh. Paonta Sahib, Distt.Sirmour (H.P) | 19.84 |
| 3. | M/S Chandel Associates, 186/10, Devi Nagar, Paonta Sahib, Distt. Sirmour | 9.5 |
| 4. | Sh. Ashok Goyal-Naveen Goyal, Prop. Goyal Crushing Company, Vill. Manpur Devra, teh. Paonta Sahib distt. Sirmour (H.P) | 10.4 |
| 5. | M/S Dev Raj Stone Crusher, Vill. Manpur Devra. Paonta Sahib Distt. Sirmour H.P | 9.53 |
| 6. | M/s Sab Giri Industries, Prop. Shri Madan Mohan Sharma, S/o Shri Natha Ram Sharma, H. No. 214, Ward No. 10, Devi | 4.91 |
| 7. | M/s Shubh Giri Industries Works, Prop: Smt. Shubhlata Sharma, W/o Shri Madan Mohan Sharma, R/o Devi Nagar, Ward. No. 10, PO & Tehsil Paonta Sahib, District Sirmour, H.P. | 3.75 |
| 8. | M/s Shubh Giri Industries Works, Prop: Smt. Shubhlata Sharma, W/o Shri Madan Mohan Sharma, R/o Devi Nagar, Ward. | 5.91 |
| 9. | M/s Shubhgiri Crushing Company, Prop. Shri Madan Mohan Sharma, Devinagar, PO Rampur Ghat, Tehsil Paonta Sahib, District Sirmour, H.P. | 13.51 |
| 10. | Sh. Gajender Pal Singh, S/o Surain Singh . 519 Vijay Park Extension, Dehardun (UK) | 10.4 |
| 11. | M/s Guru Nanak Dev St. Cr. Vill. Nawada, The. Paonta Sahib Distt. Sirmour H.P., | 5.25 |
| 12. | M/s Shirgul Mine & Minerals, Vill. Bhatorg Tehsil Paonta Sahib | 4 |
| 13. | M/s Neelgiri Stone Cr. Vill. Bhatorg Tehsil Paonta Sahib, Distt. Sirmour H.P | 2.75 |
| 14. | M/s Himalayan Stone Crusher, Vill. Manpurdevra Tehsil Paonta Sahib distt. Sirmour H.P | 6.25 |
| 15. | M/s Yaksha Industries, (Partner S/Shri Nirmal Sharma, Ravi Dogra & Manjeet Kumar), VPO Rampurghat, Tehsil Paonta Sahib, District Sirmour H.P. | 4.25 |
| 16. | Sh. Ashutosh Gupta Vill. Nawada, Teh. Paonta Sahib Distt. Sirmour H.P. | 4.75 |
| 17. | M/s Shiva Mines & Minerals Industries, Partner Shri Jagdeep Singh Tomar & Parvesh Kumar, R/o 194/4, Durga Colony, Tehsil Paonta Sahib, District Sirmour, Himachal Pradesh | 3.66 |
| 18. | M/s Rocklime & Allied Products, Prop Shri Anil Kumar Sharma, Rampur Ghat, Tehsil Paonta Sahib, District Sirmour, H.P. | 1.91 |
| 19. | M/S Goyal Brothers Stone Crusher Prop. Narender Kumar R/o Chawal Tehsil and Distt Solan HP | 5 |
| 20. | M/s A-One Minerals H. NO. 603 Sec-7 Panchkula Haryana | 4.64 |
| 21. | Radha Mines H.No. 165 Ward No. 4 Badri pur Teh. Paonta Sahib Distt. Sirmour H.P. | 3.5 |

| | | |
|---|---|---|
| 22. | Vinayak Minerals H.No. 165 Ward No. 4 Badri pur Teh. Paonta Sahib Distt. Sirmour H.P. | 2.54 |
| 23. | M/s A.R. Crushing Company, Partnership Firm (Partners S/Shri Rajesh Garg & Ashutosh Gupta), House No. 165/4, Badripur, Tehsil Paonta Sahib, District Sirmour, H.P. | 3.92 |
| 24. | Jag Mohan, Vill. Chanyan Bakyori P.O. Bhellon Tehsil Pachhad. Distt. Sirmour H.P | 2.14 |
| 25. | M/s Shiv Shakti Stone Crusher, Partner Shri Pawan Kumar, Amargarh, Tehsil Paonta Sahib, District Sirmour, H.P. | 2.51 |
| 26. | M/s Omkara Stone Crusher, (Partners S/Shri Rahul Chaudhary & Gurdeep Singh) Ward No. 6, Y-Point, Tehsil Paonta Sahib, District Sirmour H.P. | 4-23-15 |
| 27. | M/s R.J. Associates, (Partners S/Shri Jaspal S/o Shri Dalipa Ram, Jaibir S/o Shri Kuldeep Singh, Rajesh Gupta S/o Shri Prem Chand, Gopal Chand S/o Shri Sadhu Ram & Smt. Preeti Garg W/o Shri Kamal Garg), Village Nawada, P.O. Shivpur, Tehsil Paonta Sahib, District Sirmour, H.P. | 3.916 |
| | Total Area | 171.0075 Hect. |




*Upstream google earth view of Giri River near Rajban*

Giri-1

Minor Mineral Potential in the River Bed

As the stream cut its course through the Himalayan Hills of district Shimla and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the percentage of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| From Downstream of Confluence Khori Ka Nala to Confluence with River Jalal near Dadahu | 64 | 120 | 7680000 | 10368000 |

Table Showing Minor Mineral Potential and Annual Deposition of Giri-I River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 3628800 | 3110400 | 2592000 | 1036800 | 10368000 |
| Annual Deposition 5% | | | | |
| 181440 | 155520 | 129600 | 51840 | 518400 |

Recommendation

It is evident from the above table that about 10368000 metric tonnes of different sizes of minor minerals are available up to depth of one metre in this portion of river bed in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 518400 metric tonnes. As such 10368000 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Confluence Khori Ka Nala to Confluence with River Jalal near Dadahu. No concession may be granted in small tributaries for proper replenishment of River bed.

*d.* Giri-II

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 15 Cms.

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Jataun Barrage to Confluence with River Yamuna | 34 | 498 | 16932000 | 22858200 |

Table Showing Minor Mineral Potential and Annual Deposition of Giri-II River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% | River Born | Sand 25% | Clay 10% (in | Total Mineable |

| (in MT) | Bajri 30% (in MT) | (in MT) | MT) | Mineral Potential (in MT) |
|---|---|---|---|---|
| 8000370 | 6857460 | 5714550 | 2285820 | 22858200 |
| Annual Deposition 15% | | | | |
| 1200055.5 | 1028619 | 857182.5 | 342873 | 3428730 |

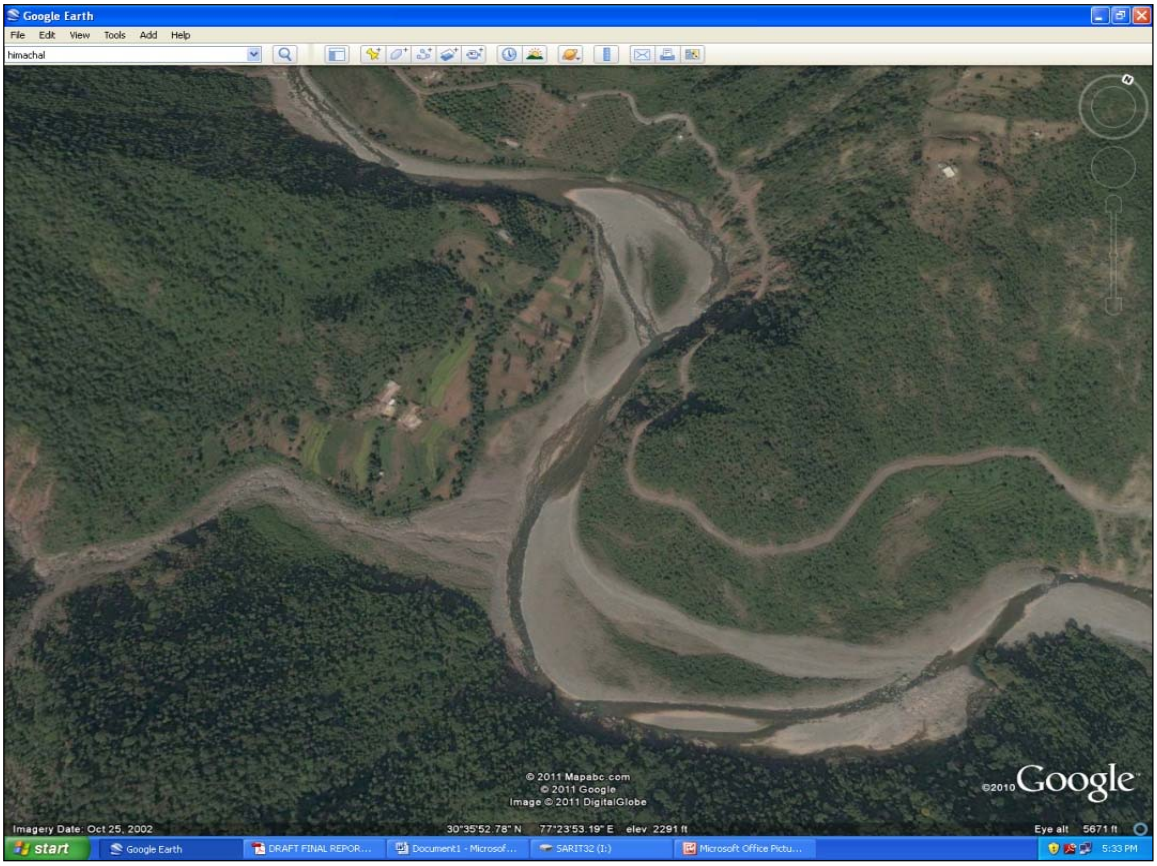
Recommendation

It is evident from the above table that about 22858200 metric tonnes of different sizes of minor m

inerals are available upto depth of one metre in the river bed of Baker khad in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 3428730 metric tonnes. As such 22858200metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed. The mineral concession may be granted in the river bed From Downstream of Jataun Barrage to Confluence with River Yamuna. No mineral concession may be granted in small tributaries for proper replenishment of river.

Jalal (Toposheet No. 53F2 and 53F3 )

River Jalal is the right bank tributary of the river Giri and merge into Giri near Dadahu. Its Total length in Sirmour is about 39 km. It originates from the Sainki Dhar at an elevation of 1868 metre.




Upstream google earth view of River Jalal near village Baneri

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Odar to Confluence with River Giri | 27 | 45 | 1215000 | 1640250 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the percentage of each mineral constituent up to a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Jalal River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 574087.5 | 492075 | 410062.5 | 164025 | 1640250 |
| Annual Deposition 5% | | | | |
| 28704.3 | 24603.7 | 20503.1 | 8201.2 | 82012.3 |

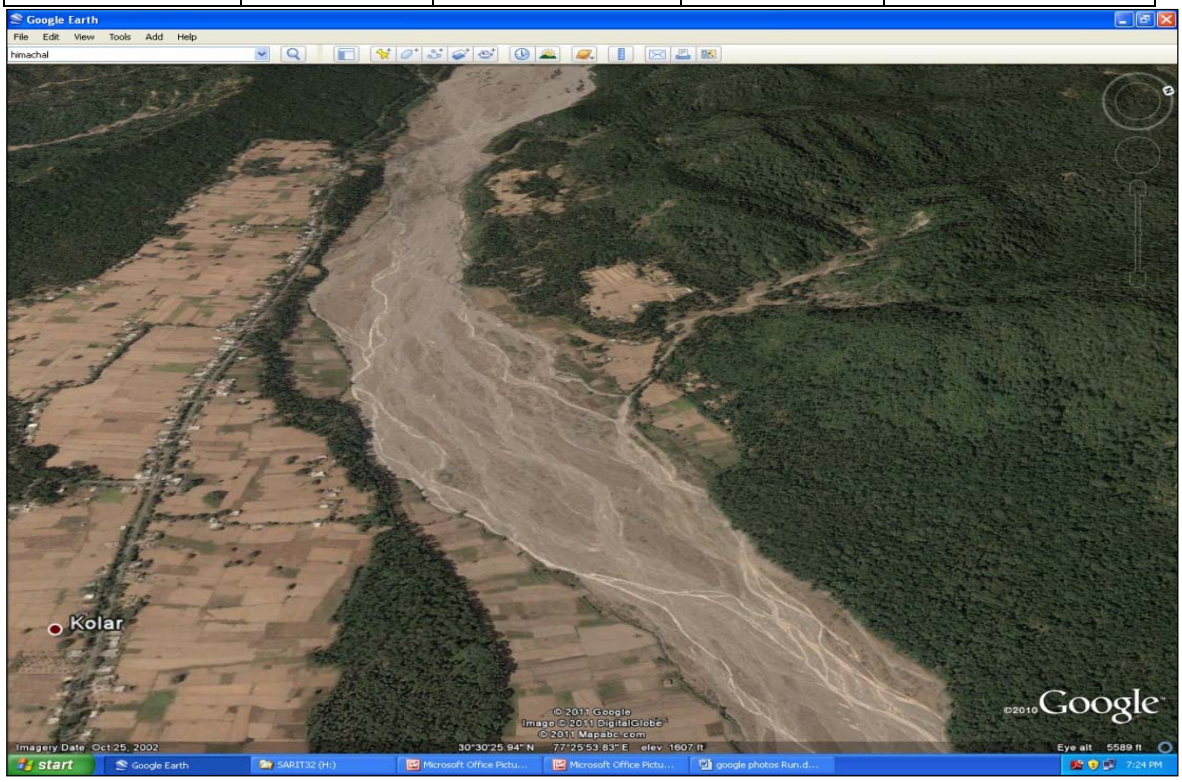
Recommendation

It is evident from the above table that about 1640250 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Jalal river in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 82012 metric tonnes. As such 1640250 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Jalal River from downstream of Village Odar to Confluence with River Giri near Dadahu. No mineral concession may be granted in small tributaries of the river.

Bata (Toposheet No. 53F2 and 53F3 )

River Bata is the right bank tributary of the river Yamuna and merge into Yamuna near Paonta Sahib. Its Total length in Sirmour is about 36 km. It originates from the Daghera Reserve Forests at an elevation of 1460 metre.

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60% of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Uttamwala to Confluence with River Yamuna | 26 | 290 | 7540000 | 10179000 |




*Upstream google earth view of Bata River near Kolar*

## Present status of mining

Presently there is 3 numbers of mining leases has been granted in Bata river. Out of these, 1 Nos. of mining lease have been granted for extraction of minor mineral for Open sale and 2 numbers of mining leases have been granted for the stone crusher. The detail is as under:-

## For Open Sale

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | Shri Shakun Gupta, M/S Shakumbhri Minerals, R/O Gupta House, Hindu Ashram Road Nahan, Distt. Sirmaur, HP | 3.7 |

| | | |
|---|---|---|
| | Total Area | 3.7 Hect. |

For Stone Crusher

| Sr. No | Name & Address of mining lease holder | Area (in Hect.) |
|---|---|---|
| 1. | Sh. Kirnesh Jung Prop: M/s Arikesh Stone Crusher Village Ganguwala, P.O. Bata Mandi, Tehsil Paonta Sahib, District Sirmour, H.P. | 4-88-05 |
| 2. | Mohakam Singh, Vill. Suraj Pur Tehsil Paonta Sahib Distt. Sirmour H.P. | 2.34 |
| | Total Area | 7.2205 Hect. |

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 15 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Bata River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 3562650 | 3053700 | 2544750 | 1017900 | 10179000 |
| Annual Deposition 15% | | | | |
| 534397.5 | 458055 | 381712.5 | 152685 | 1526850 |

Recommendation

It is evident from the above table that about 10179000 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Bata River in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 1526850 metric tonnes. As such 10179000 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Bata from Downstream of Village Uttamwala to Confluence with River Yamuna and no mineral concession may be granted in small tributaries for proper replenishment of River.

Nera (Toposheet No. 53F2 and 53F3 )

River Nera is the right bank tributary of the river Tons and merge into Tons near Pojal. Its Total length in Sirmour is about 26.8 km. It originates from the Juni Dhar at an elevation of 2450 metre.

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60% of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Bheta to Village Koti | 8.4 | 62 | 520800 | 703080 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Upper Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Nera River

| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 246078 | 210924 | 175770 | 70308 | 703080 |
| Annual Deposition 5% | | | | |
| 12303.9 | 10546.2 | 8788.5 | 3515.4 | 35154 |

Recommendation

It is evident from the above table that about 703080 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Nera River in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 35154 metric tonnes. As such 703080 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Nera River from Downstream of Village Bheta to Village Koti and no mineral concession may be granted in small tributaries for proper replenishment of River.

Tons (Toposheet No. 53F/14 )

River Tons is the right bank tributary of the river Yamuna and merge into Yamuna near Dakpathar. Its Total length in Sirmour is about 48.6 km. It originates from the Yamounotori glacier at an elevation of 6387 metre.


*Upstream google earth view of Tons Near Village Kolawar*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of village Dhamog to Confluence with Yamuna River | 12.3 | 38 | 467400 | 630990 |

## Present status of mining

Presently no mineral concession has been granted in the beds of this stream.

## Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 10 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Tons River

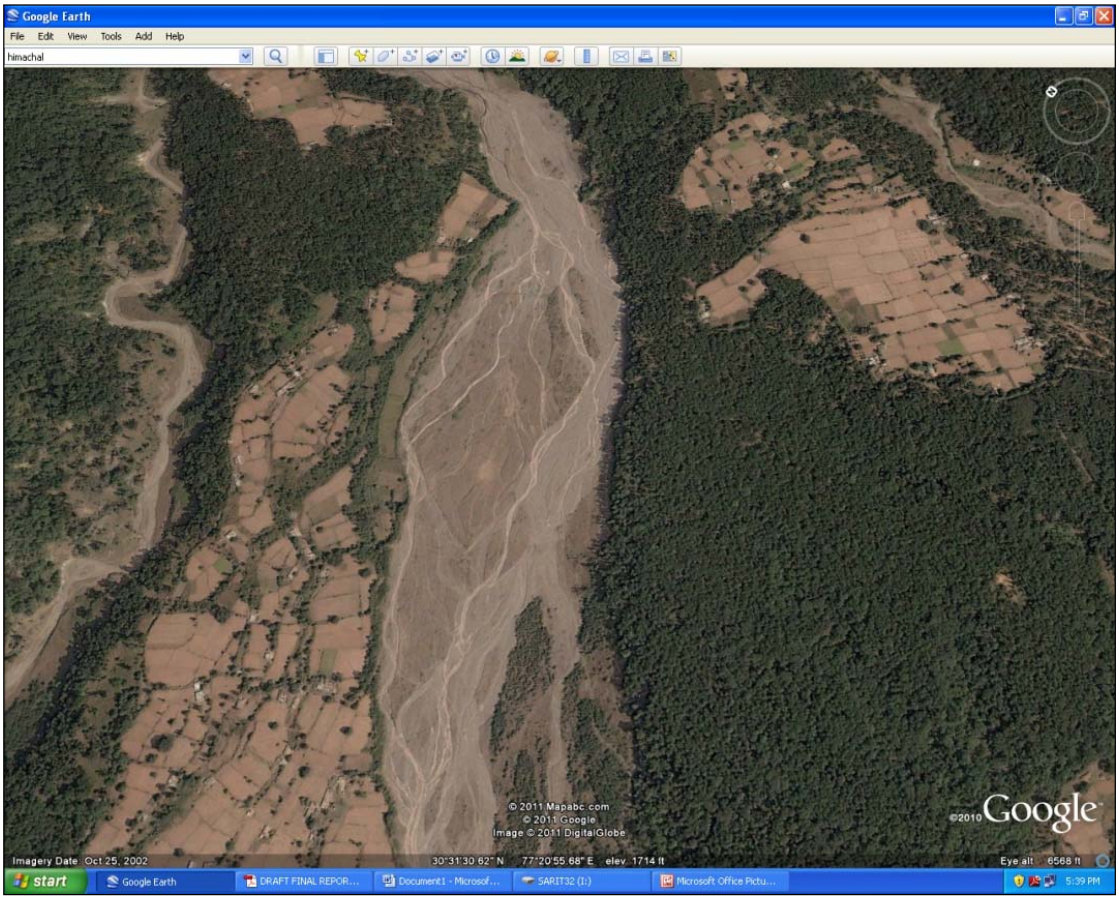
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 220846.5 | 189297 | 157747.5 | 63099 | 630990 |
| Annual Deposition 10% | | | | |
| 22084.6 | 18929.7 | 15774.7 | 6309.9 | 63099 |

Recommendation

It is evident from the above table that about 630990metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Tons River in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 63099 metric tonnes. As such 630990metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Tons River from Downstream of village Dhamog to Confluence with Yamuna River. No mineral concession may be granted in small tributaries such for proper replenishment of River.

Markanda River (Toposheet No. 53F2 and 53F3 )

Markanda River is the right bank tributary of the river Ghaggar and enters in State of Haryana near Kala Amb. Its Total length in Sirmour is about 27.6 km. It originates from the Simbhwala Dhar near village Santhal at an elevation of 1390 metre.




*Upstream google earth view of Markanda river near village Bankalan*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Gara to Haryana Border | 21 | 140 | 2940000 | 3969000 |

Present status of mining.

Presently only one Mining lease have been granted in the bed of this stream in favour of M/s Tribhuvan Stone Crusher, Prop. Shri Ram Pal Malik, Village & P.O. Shambuwala, Tehsil Nahan, Distt. Sirmour, H.P for running stone crusher.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Markanda River

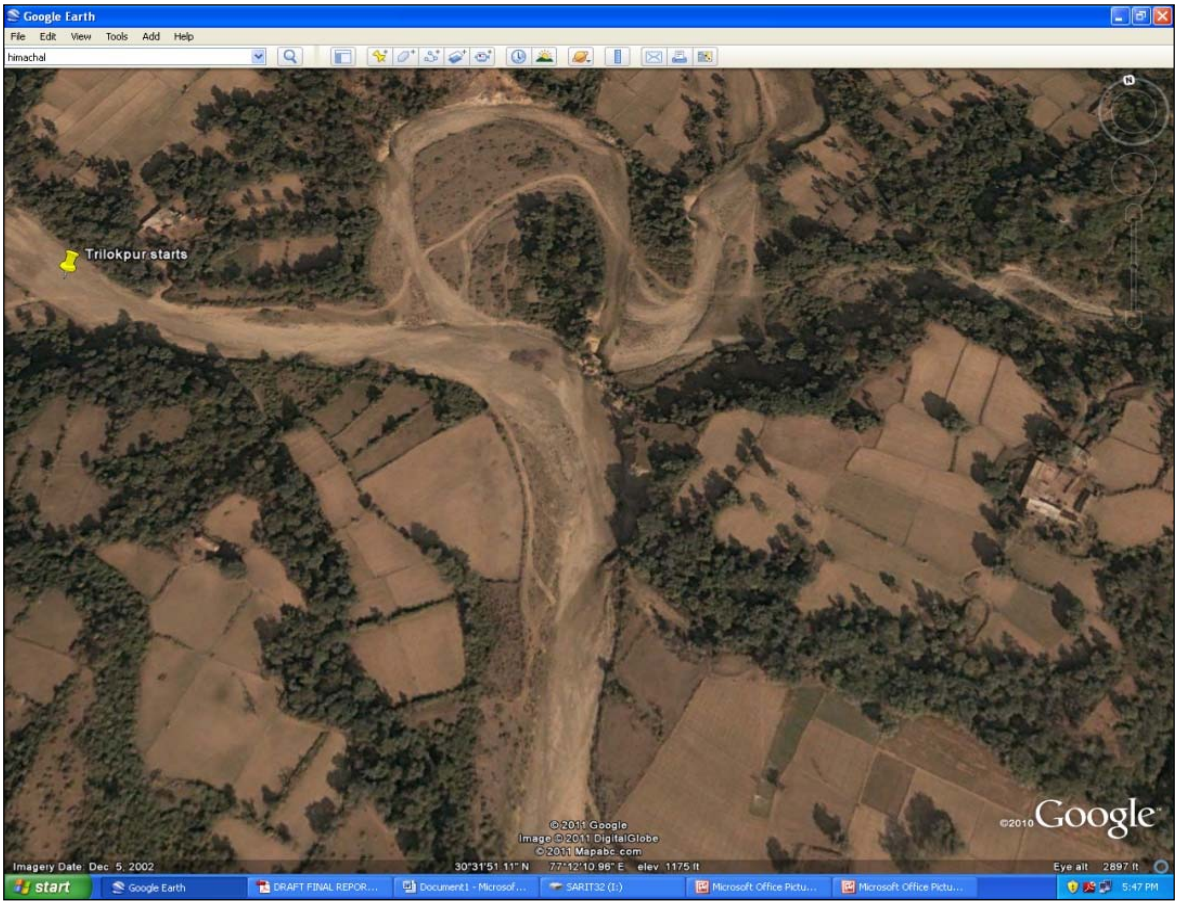
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 1389150 | 1190700 | 992250 | 396900 | 3969000 |
| Annual Deposition 5% | | | | |
| 69457.5 | 59535 | 49612.5 | 19845 | 198450 |

Recommendation

It is evident from the above table that about 3969000 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Markanda River in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 198450 metric tonnes. As such 3969000 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Markanda River from Downstream of Village Gara to Haryana Border. No concession may be granted in small tributaries for proper replenishment of Khad.

Trilokpur Ki Nadi (Toposheet No. 53F2 and 53F3 )

Trilokpur ki Nadi is the right bank tributary of the Run Nadi and and enters in State of Haryana near Khairi. Its Total length in Sirmour is about 9.8 km. It originates from the Kaluwala Ki Dhar at an elevation of 590 metre.




*Upstream google earth view of Trlokpur ki Nadi near Village Khairi*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of the Motorable Bridge Near Village Bhudra to Haryana Border | 3.4 | 68 | 231200 | 312120 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Trilokpur ki Nadi

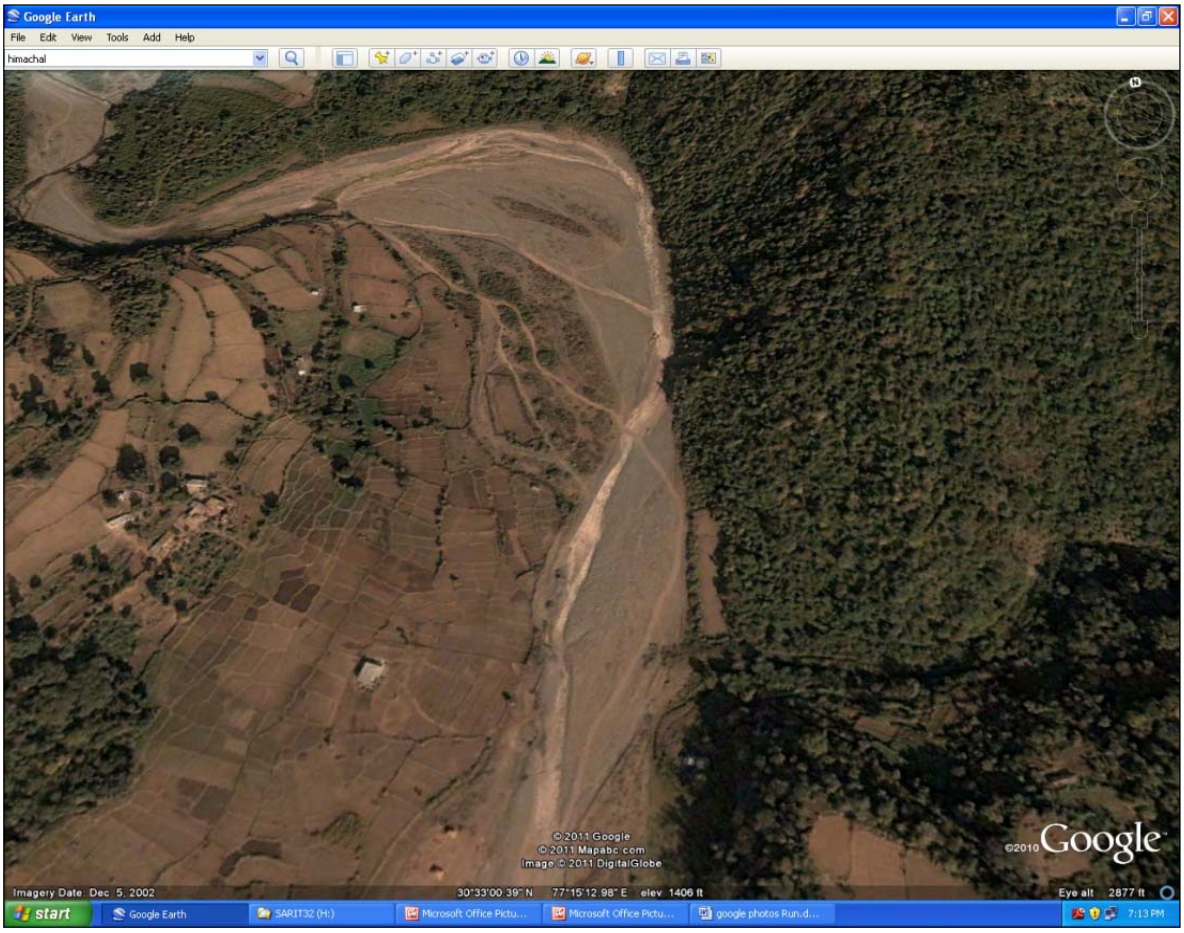
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 109242 | 93636 | 78030 | 31212 | 312120 |
| Annual Deposition 5% | | | | |
| 5462.1 | 4681.8 | 3901.5 | 1560.6 | 15606 |

Recommendation

It is evident from the above table that about 312120 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Trilokpur ki Nadi in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 15606 metric tonnes. As such 312120 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Trilokpur ki Nadi from Downstream of the Motorable Bridge Near Village Bhudra to Haryana Border. No mineral concession may be granted in small tributaries for proper replenishment of Khad.

Salani Ki Nadi (Toposheet No. 53F2 and 53F6 )

Salani ki Nadi is the right bank tributary of the Markanda River and merge into Markanda near village Dida. Its Total length in Sirmour is about 18.2 km. It originates from near village Shilli Shinari in Jhira Reserve Forests at an elevation of 1150 metre.




*Upstream google earth view of Salauni Ki Nadi near village Danta*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Maholiya Bas to Confluence with River Markanda | 7.6 | 64 | 486400 | 656640 |

Present status of mining.

Presently only one Mining lease have been granted in the bed of this stream in favour of M/S Maa Vaishno Stone Crusher, Village Salani Katola, P.O. Sain Wala, Tehsil Nahan, Distt. Sirmour, H.P. for running stone crusher.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constitute up to a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Salauni Ki Nadi

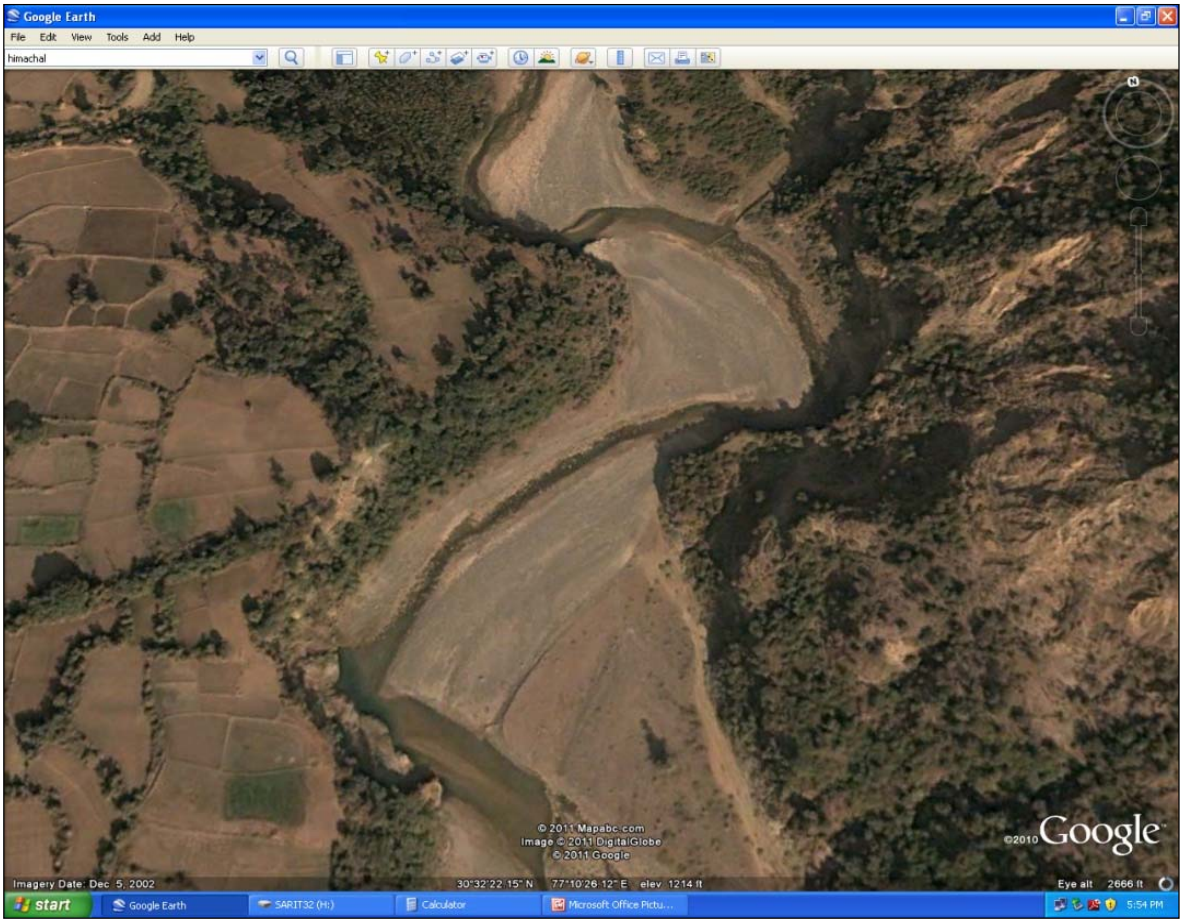
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 229824 | 196992 | 164160 | 65664 | 656640 |
| Annual Deposition 5% | | | | |
| 11491.2 | 9849.6 | 8208 | 3283.2 | 32832 |

Recommendation

It is evident from the above table that about 656640 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Salauni Ki Nadi which can be safely be removed. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 32832 metric tonnes. As such 656640 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Maholiya Bas to Confluence with River Markanda. No concession may be granted in small tributaries for proper replenishment of Khad.

Run Nadi (Toposheet No. 53F2 and 53F6)

Run Nadi is the right bank tributary of the Markanda River and enters in State of Haryana near Mirpur village. Its Total length in Sirmour is about 21.4 km. It originates from Dharti Dhar at an elevation of 1290 metre.




*Upstream google earth view of Run Nadi near village Kotla*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of confluence of Tarapur Ki Nadi to Haryana Border | 9.5 | 90 | 855000 | 1154250 |

Present status of mining.

Presently One Mining lease have been granted in the bed of this stream in favour of Shri Naib Singh, Prop. M/S Shiv Shakti Stone Crusher, Village Mirzapur, Tehsil Naraingarh Haryana for running of stone crusher.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Run Nadi

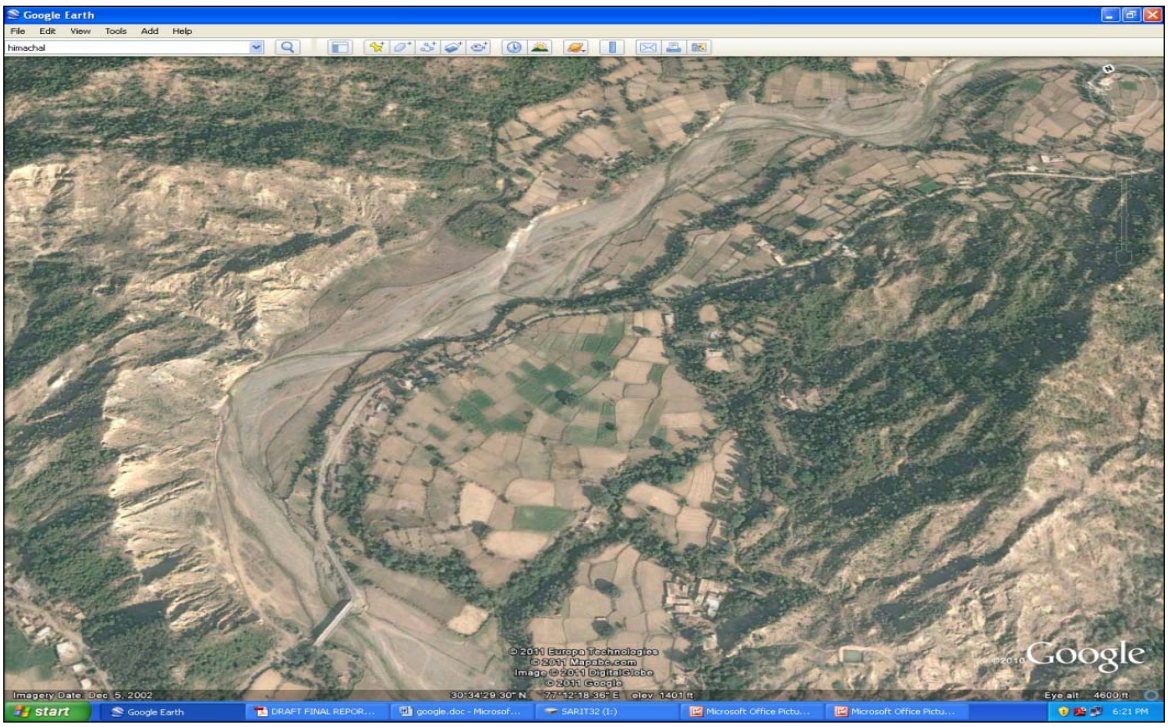
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 403987.5 | 346275 | 288562.5 | 115425 | 1154250 |
| Annual Deposition 5% | | | | |
| 20199.3 | 17313.7 | 14428.1 | 5771.2 | 57712.3 |

## Recommendation

It is evident from the above table that about 1154250 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Run Nadi in the Sirmour District. Similarly the annual deposition of minor mineral in the river bed is approximately to the tune of 57712 metric tonnes. As such 1154250 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed of Run Nadi from Downstream of confluence of Tarapur Ki Nadi to Haryana Border. No mineral concession may be granted in small tributaries for proper replenishment of Khad.

## Kandiwala Ki Nadi (Toposheet No. 53F2 and 53F6 )

Kandiwala ki Nadi is the Left bank tributary of the Run Nadi and merge into Run near village Telpura. Its Total length in Sirmour is about 12.8 km. It originates from Kangu Ki Dhar at an elevation of 1282 metre.



Upstream google earth view of Kandiwala ki Nadi near Barma

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Kandiwala to Confluence with Run Nadi | 5.1 | 68 | 346800 | 468180 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Kandiwala ki Nadi

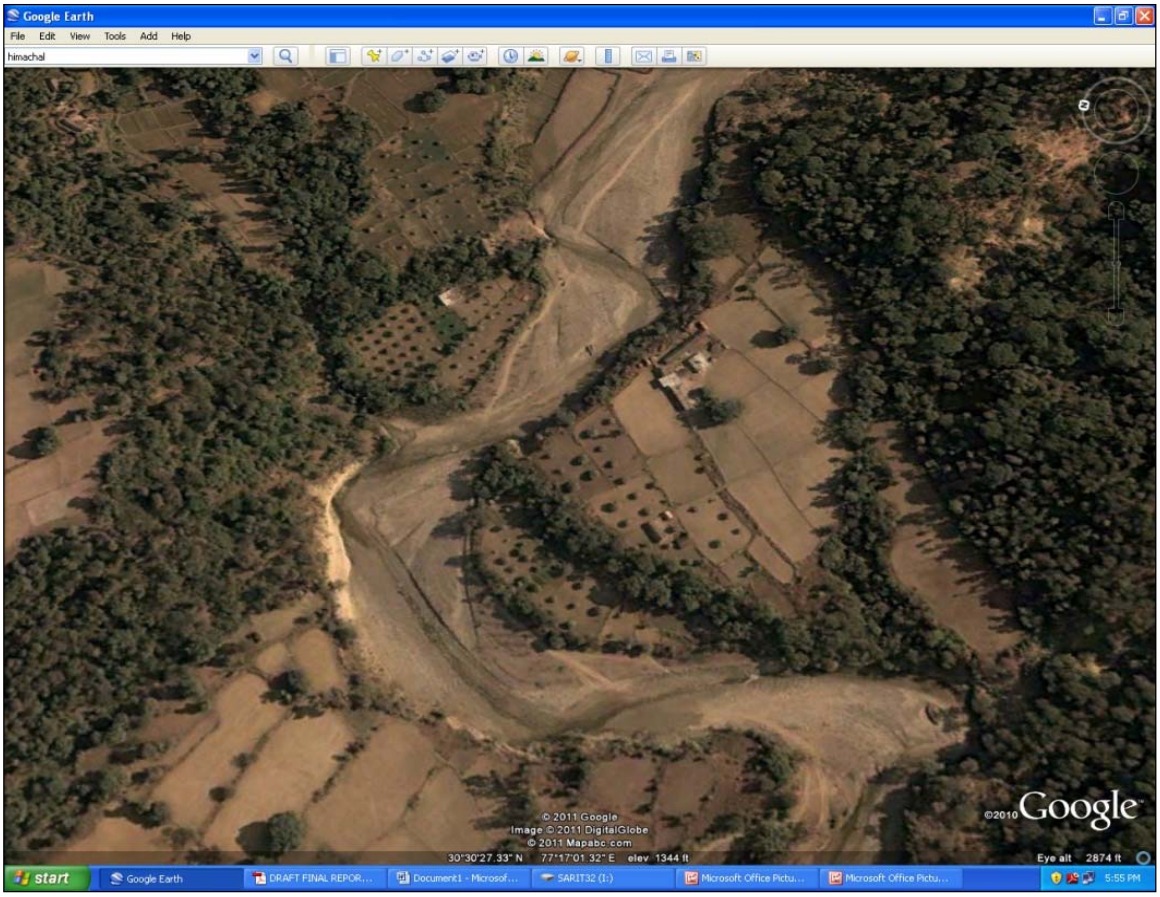
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 163863 | 140454 | 117045 | 46818 | 468180 |
| Annual Deposition 5% | | | | |
| 8193.1 | 7022.7 | 5852.2 | 2340.9 | 23408.9 |

Recommendation

It is evident from the above table that about 468180 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Kandiwala ki Nadi in the Sirmour District. Similarly the annual deposition of minor mineral in the river bed is approximately to the tune of 23408 metric tonnes. As such 468180 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Kandiwala to Confluence with Run Nadi. No concession may be granted in small tributaries for proper replenishment of Khad.

Khairi Ka Khala (Toposheet No. 53F/6 )

Khairi ka Khala is the Left bank tributary of the Markanda River and merge into Markanda near village Kanthra. Its Total length in Sirmour is about 6.6 km. It originates from Khairwala Reserve Forest at an elevation of 650 metre.




*Upstream google earth view of Kairi Ka Khala near Village Simbalwala*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Simbalwala to Confluence with River Markanda | 3.2 | 72 | 230400 | 311040 |

## Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

## Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy

sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Khairi ka Khala

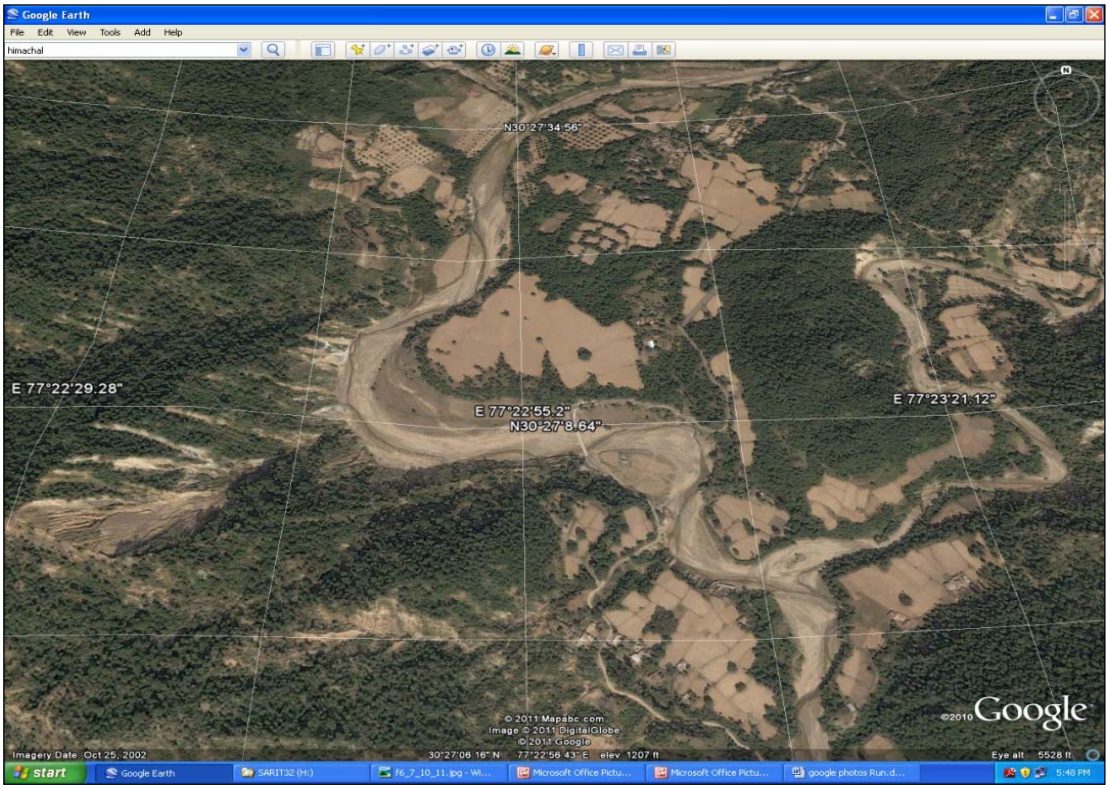
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 108864 | 93312 | 77760 | 31104 | 311040 |
| Annual Deposition 5% | | | | |
| 5443.2 | 4665.6 | 3888 | 1555.2 | 15552 |

Recommendation

It is evident from the above table that about 311040 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Khairi ka Khala in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 15552 metric tonnes. As such 311040 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Simbalwala to Confluence with River Markanda. No mineral concession may be granted in small tributaries for proper replenishment of Khad.

Somb Nadi (Toposheet No. 53F/6 and 53F/7)

Somb is the Right bank tributary of the Yamuna River and enters in State of Haryana near Devwala village. Its Total length in Sirmour is about 9.3 km. It originates from Nagiwala Reserve Forest at an elevation of 636 metre.




*Upstream google earth view of Somb Nadi near village Haripur*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Dhakranwala to Haryana Border Near Devwala Village | 5.4 | 96 | 518400 | 699840 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Somb Nadi

| Mineral Potential |
|---|

| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
|---|---|---|---|---|
| 244944 | 209952 | 174960 | 69984 | 699840 |
| Annual Deposition 5% | | | | |
| 12247.2 | 10497.6 | 8748 | 3499.2 | 34992 |

Recommendation

It is evident from the above table that about 699840 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Somb Nadi in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 34992 metric tonnes. As such 699840 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Dhakranwala to Haryana Border Near Devwala Village. No mineral concession may be granted in small tributaries for proper replenishment of Stream.

Lohgarh Ka Khol (Toposheet No. 53F/7)

Lohgarh ka Khol is the Left bank tributary of the Somb Nadi and and enters in State of Haryana near Bhagwanpur village of Haryana. Its Total length in Sirmour is about 9.8 km. It originates from Lohgarh Reserve Forest at an elevation of 655 metre.


*Upstream google earth view of Lohgarh Ka Khol near village Lohgarh*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Lohgarh to Haryana Border | 6.6 | 48 | 316800 | 427680 |

Present status of mining

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Lohgarh Ka Khol

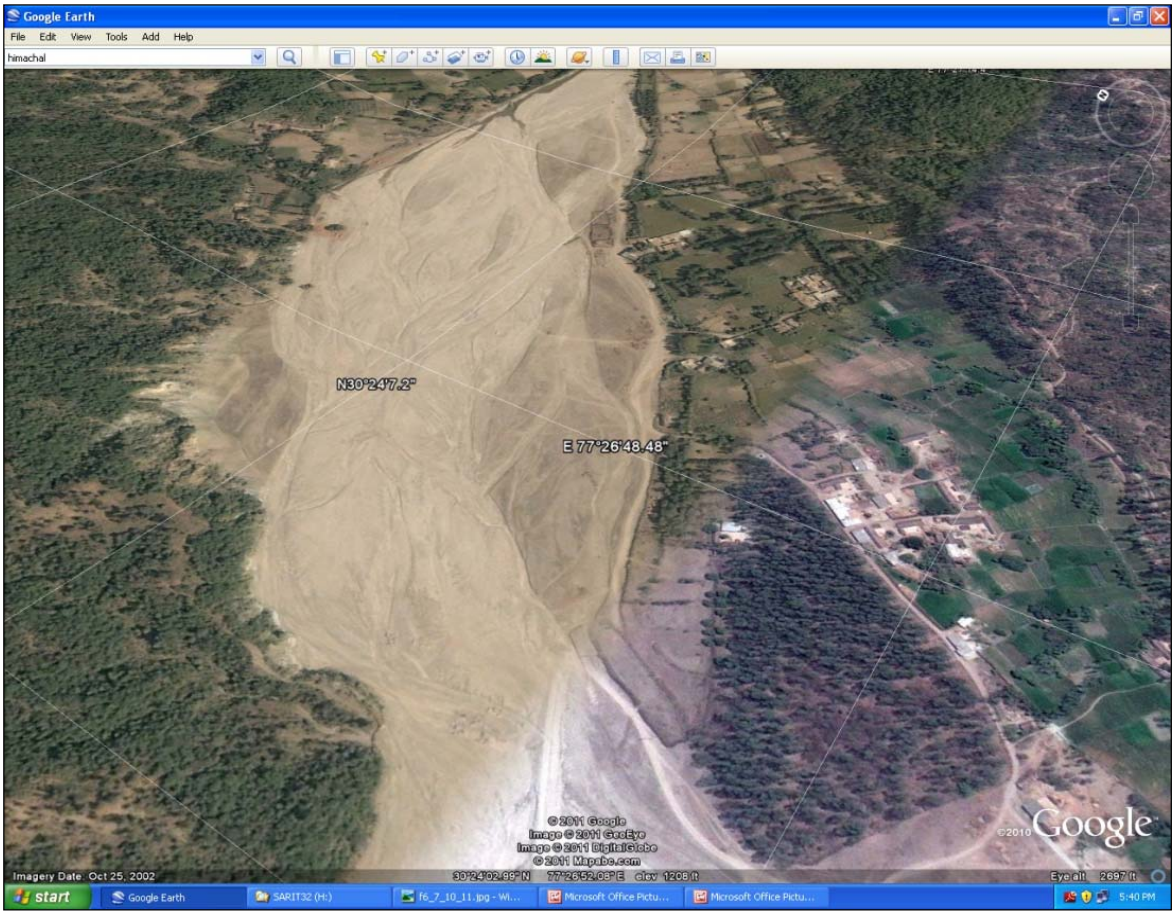
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 149688 | 128304 | 106920 | 42768 | 427680 |
| Annual Deposition 5% | | | | |
| 7484.4 | 6415.2 | 5346 | 2138.4 | 21384 |

Recommendation

It is evident from the above table that about 427680 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Lohgarh ka Khol in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 21384 metric tonnes. As such 427680 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Lohgarh to Haryana Border. No mineral concession may be granted in small tributaries for proper replenishment of Khad.

Nimbuwala Khala(Toposheet No. 53F/7)

Nimbuwala Khala Right bank tributary of the Yamuna River and enters in State of Haryana near Palhori village. Its Total length in Sirmour is about 15.5 km. It originates from Garuk Reserve Forest at an elevation of 635 metre.




*Upstream google earth view of Nimbuwala Khala near village Palhori*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Pir Marusidh to Haryana Border Near Village Palhori | 8.6 | 96 | 825600 | 1114560 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Nimbuwala Khala

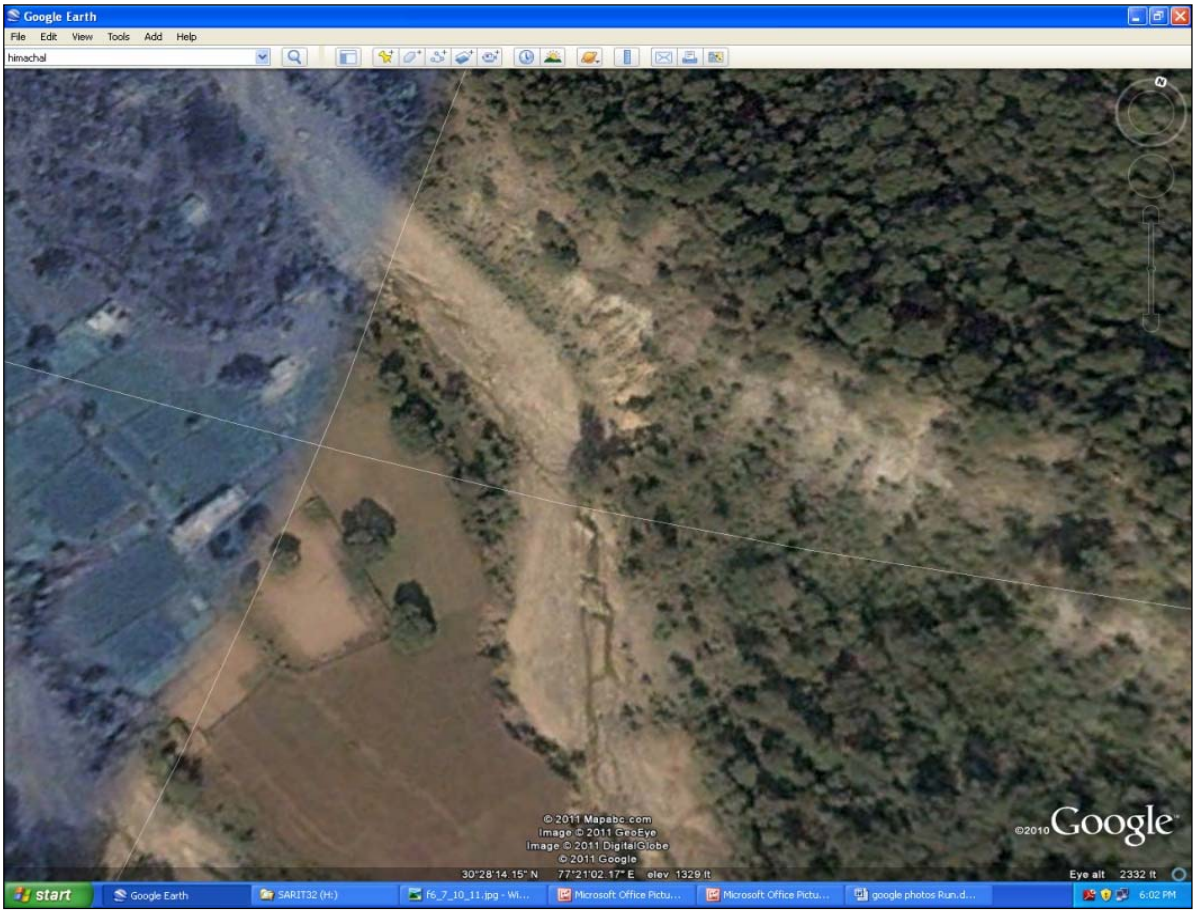
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 390096 | 334368 | 278640 | 111456 | 1114560 |
| Annual Deposition 5% | | | | |
| 19504.8 | 16718.4 | 13932 | 5572.8 | 55728 |

Recommendation

It is evident from the above table that about 1114560 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Nimbuwala Khala in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 55728 metric tonnes. As such 1114560 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Village Pir Marusidh to Haryana Border Near Village Palhori. No mineral concession may be granted in small tributaries for proper replenishment of Khad.

Matar Ki Khol (Toposheet No. 53F/6 and 53F/7)

Matar ki Khol is Right bank tributary of the Somb Nadi and enters in State of Haryana near Katgarh village. Its Total length in Sirmour is about 7.9 km. It originates from Brahmanwala Reserve Forest at an elevation of 648 metre.




*Upstream google earth view of Matar ka Khol near village Matar*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Confuence of Kalhuwala and Brahamanwala streams to Village Matar | 4.6 | 46 | 211600 | 285660 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of

one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Matar Ki Khol

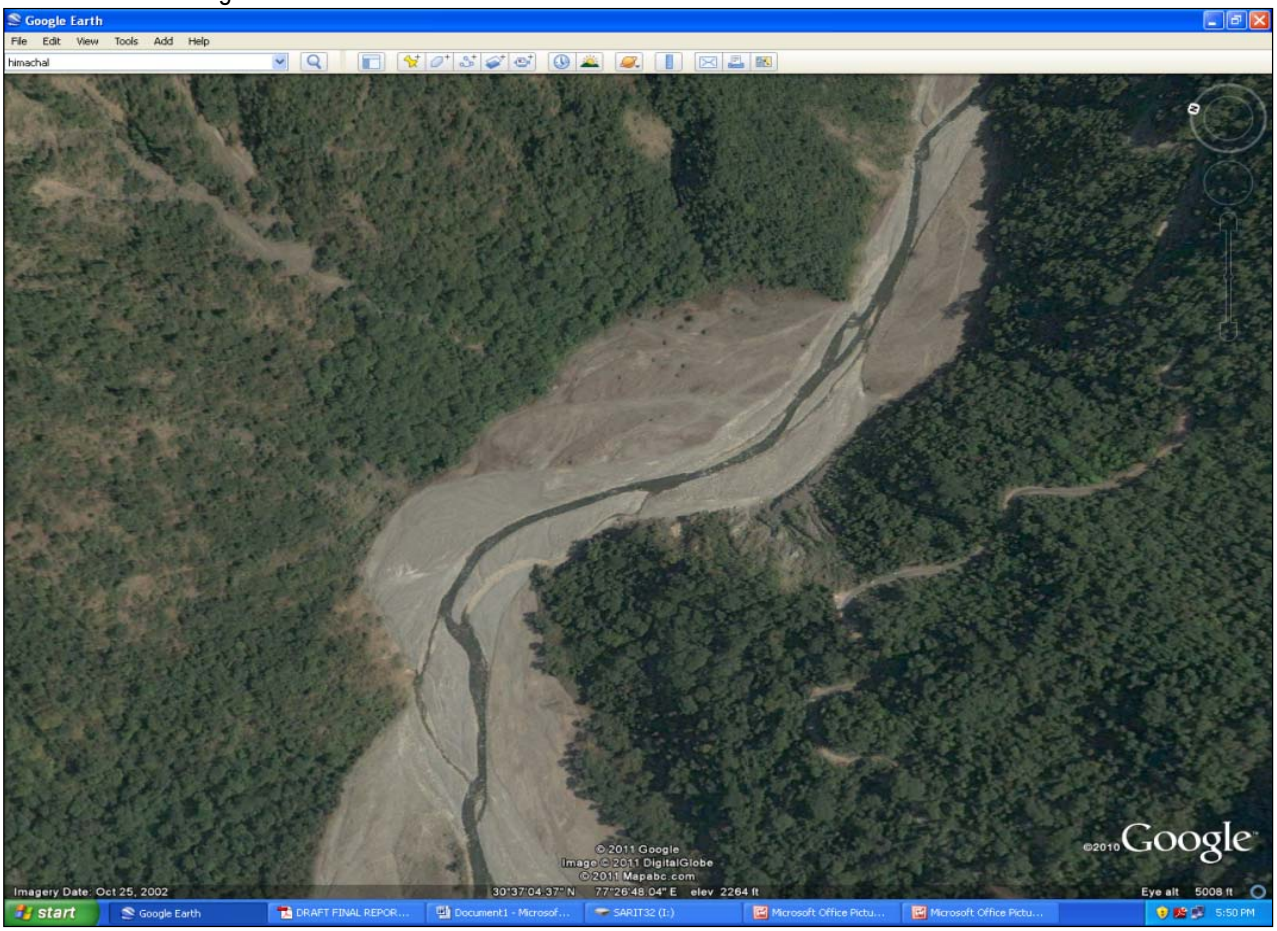
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 99981 | 85698 | 71415 | 28566 | 285660 |
| Annual Deposition 5% | | | | |
| 4999 | 4284.9 | 3570.7 | 1428.3 | 14282.9 |

## Recommendation

It is evident from the above table that about 285660 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Matar Ki Khol in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 14282 metric tonnes. As such 285660 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Confluence of Kalhuwala and Brahamanwala streams to Village Matar. No concession may be granted in small tributaries for proper replenishment of Khad.

## Jagat Ka Nala (Toposheet No. 53F/6 and 53F/10)

Jagat ka Nala is Right bank tributary of the Giri river and merge into Giri. Its Total length in Sirmour is about 20.6 km. It originates from Dawai Dhar at an elevation of 2462 metre.




*Upstream google earth view of Jagat ka Khala near Confluence with Giri*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of village satna to Confluence with River Giri | 2.3 | 90 | 207000 | 279450 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent like boulder, river borne bajri, sand upto a depth of one metre leaving the clay and silt as waste. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Jagat Ka Nala

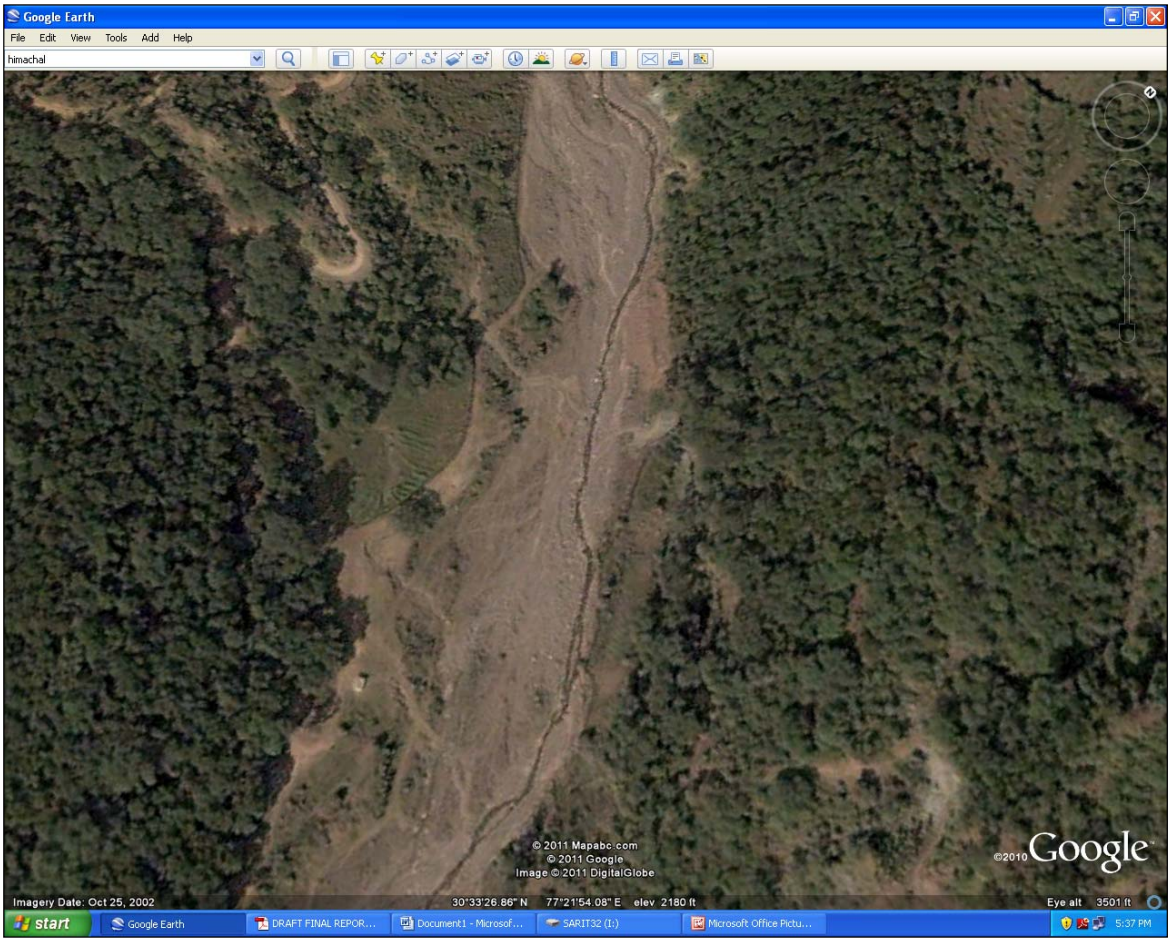
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 97807.5 | 83835 | 69862.5 | 27945 | 279450 |
| Annual Deposition 5% | | | | |
| 4890.3 | 4191.7 | 3493.1 | 1397.2 | 13972.3 |

Recommendation

It is evident from the above table that about 279450 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Jagat Ka Nala in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 13972 metric tonnes. As such 279450 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of village satna to Confluence with River Giri. No mineral concession may be granted in small tributaries for proper replenishment of Stream.

Katli Ki Nadi (Toposheet No. 53F/6)

Katli Ki Nadi is the right bank tributary of River Markanda. It merge into Markanda near village Dhagat. Its Total length in Sirmour is about 5.2 km. It originates from the Simbhwala Dhar near village Santhal at an elevation of 1390 metre.




*Upstream google earth view of Katli ki nadi near village Katli*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of village Karlia to Confuence with Dhagat Ka Khala | 2.2 | 74 | 162800 | 219780 |

Present status of mining.

Presently no mineral concession has been granted in the beds of this stream.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Katli Ki Nadi

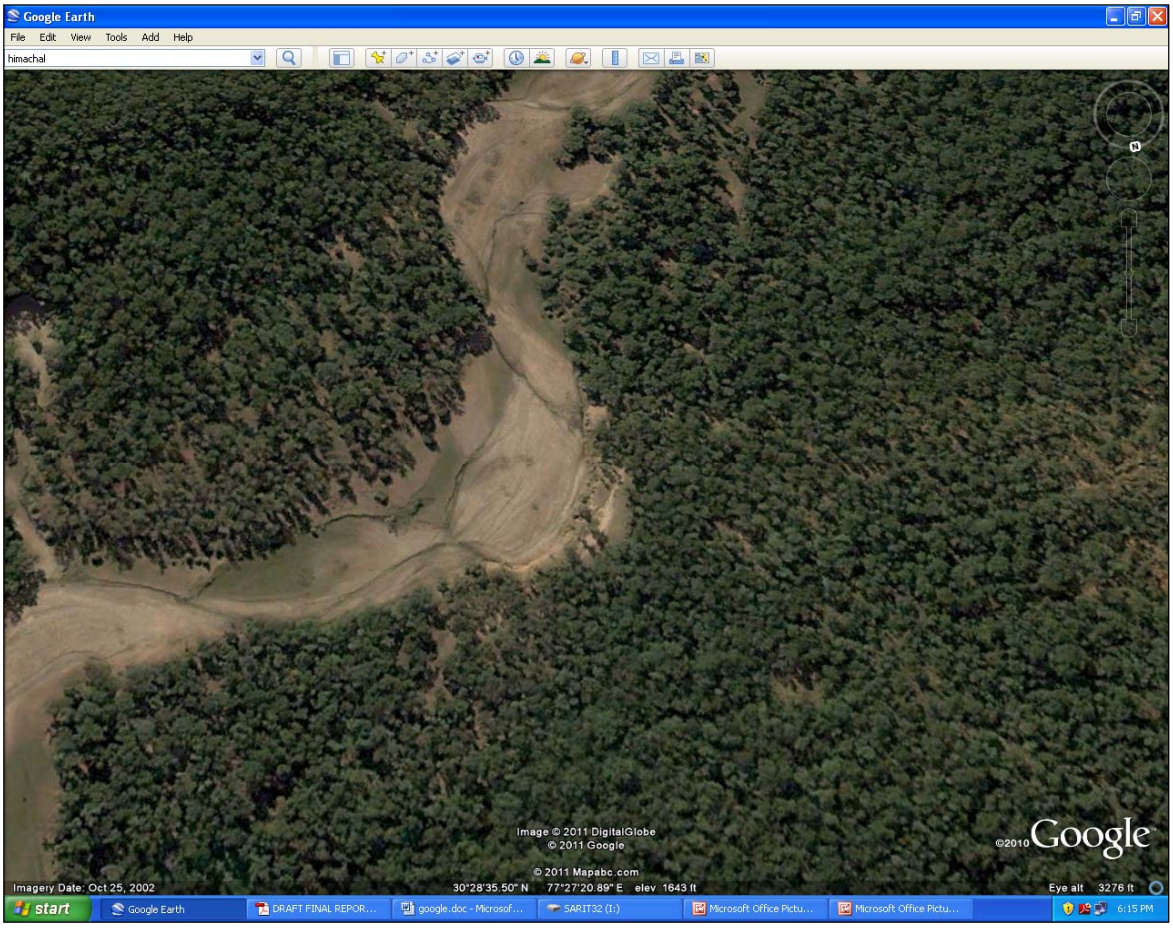
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 76923 | 65934 | 54945 | 2197.8 | 219780 |
| Annual Deposition 5% | | | | |
| 3846.1 | 3296.7 | 2747.2 | 1098.9 | 10988.9 |

## Recommendation

It is evident from the above table that about 219780 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Katli ki Nadi in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 10988 metric tonnes. As such 219780 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of village Karlia to Confluence with Dhagat Ka Khala. No concession may be granted from Wah Devi to Matlahna. The mineral concession may be granted in small tributaries for proper replenishment of Khad.

## Sudanwala Khala (Toposheet No. 53F/6 and 53F/7)

Sudanwala Khala is the right bank tributary of River Bata. It merges into Bata near Dhaula Kuan. Its Total length in Sirmour is about 6.4 km. It originates from the Sudanwala Reserve Forest at an elevation of 655 metre.




Upstream google earth view of Sudanwala Khala near confluence with Gariwali Khol

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Confluence of Gariwali Khol to Confluence with river Giri | 3.2 | 78 | 249600 | 336960 |

## Present status of mining

Presently no mineral concession has been granted in the beds of this stream.

## Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of

one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Sudanwala Khala

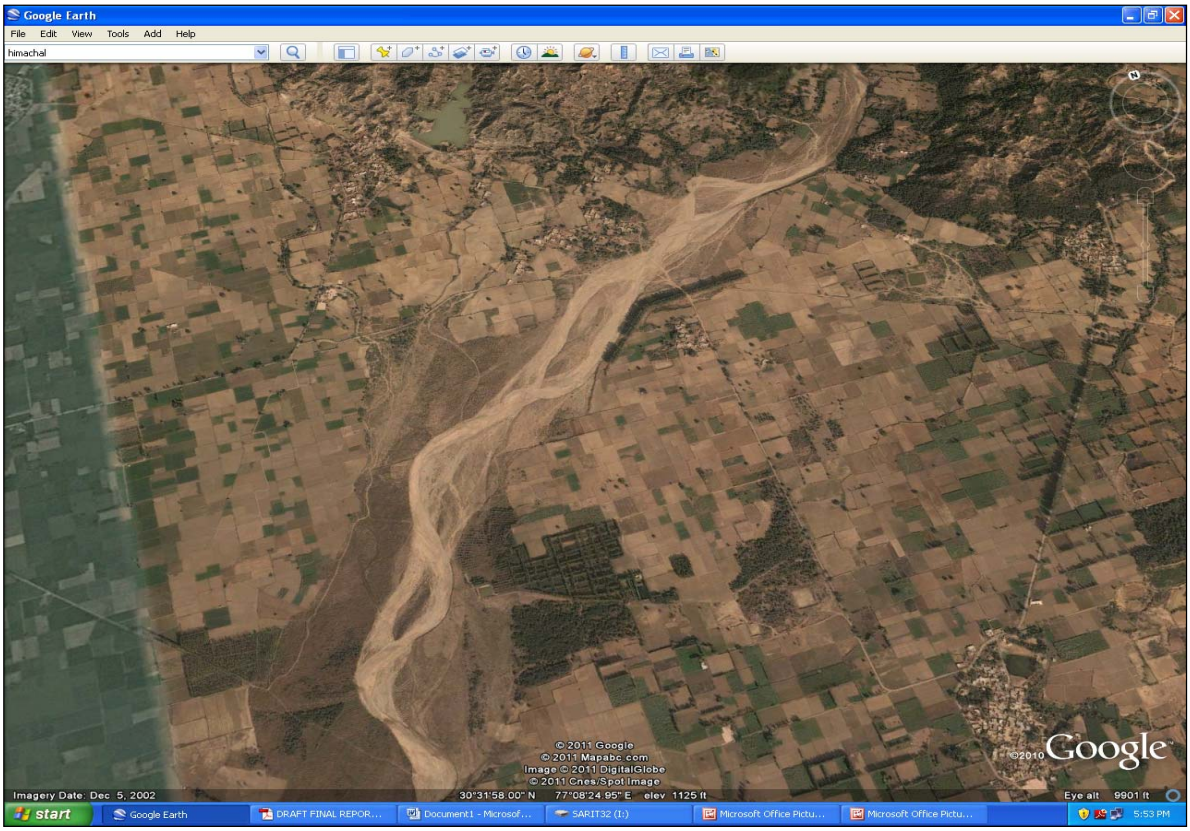
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 117936 | 101088 | 84240 | 33696 | 336960 |
| Annual Deposition 5% | | | | |
| 5896.8 | 5054.4 | 4212 | 1684.8 | 16848 |

## Recommendation

It is evident from the above table that about 336960 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Sudanwala Khala in the Sirmour District. Similarly the annual deposition of minor mineral in the river bed is approximately to the tune of 16848 metric tonnes. As such 336960 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Confluence of Gariwali Khol to Confluence with river Giri. No concession may be granted in small tributaries for proper replenishment of Khad

## Gumti Nadi (Toposheet No. 53F/2)

Gumti Nadi is the left bank tributary of River Ghaggar and enters in State of Haryana near Katgarh village Churan. Its Total length in Sirmour is about 13.4 km. It originates from the Gumti sambhalwa Reserve Forest at an elevation of 620 metre




*Upstream google earth view of Gumti Nadi near Haryana Border*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Near Village Gumti to Haryana Border | 9.8 | 38 | 372400 | 502740 |

Present status of mining.

Presently only one Mining lease has been granted in the bed of this stream in favour of Shri Shiv Kumar, Prop. M/s Shiva Stone Crusher, Village Churan, Tehsil Nahan, District Sirmour, H.P for running stone crusher.

Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the % age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Gumti Nadi

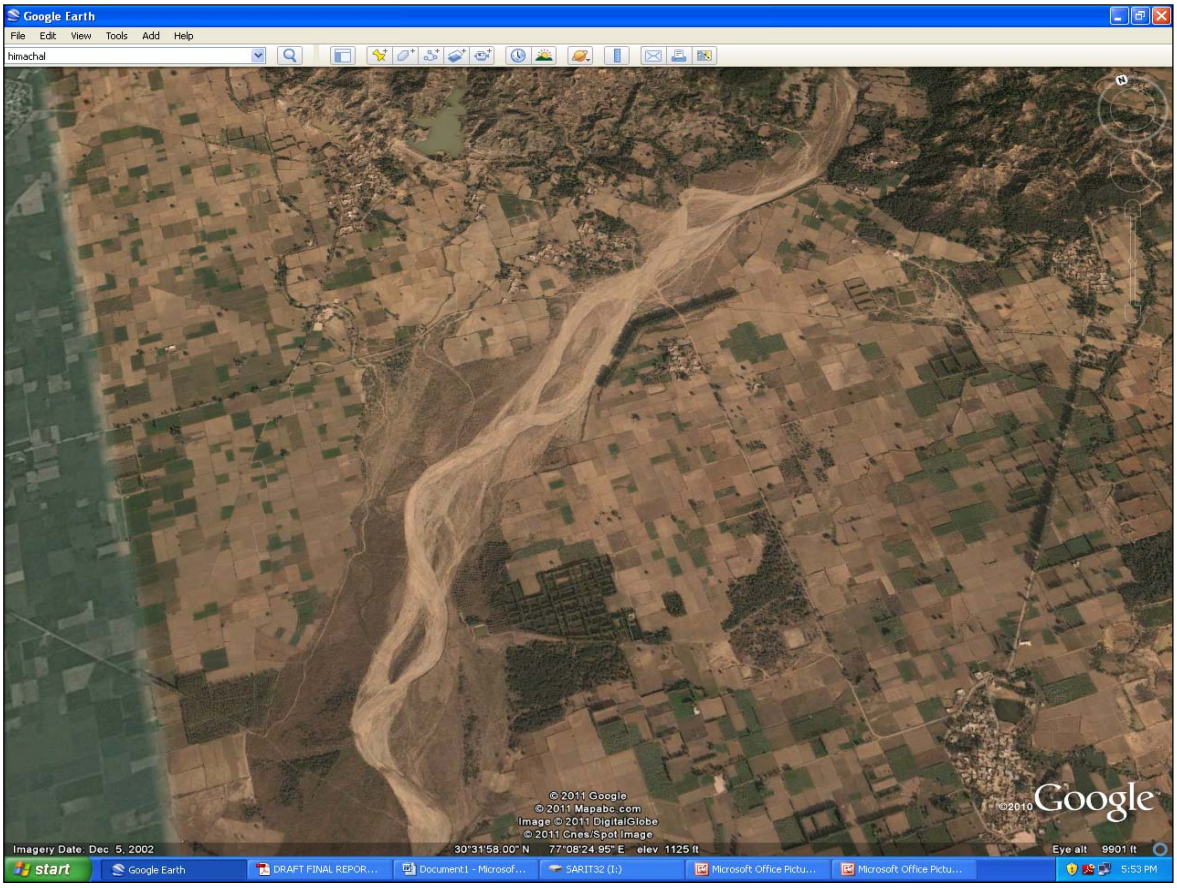
| Mineral Potential | | | | |
|---|---|---|---|---|
| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
| 175959 | 150822 | 125685 | 50274 | 502740 |
| Annual Deposition 5% | | | | |
| 8797.9 | 7541.1 | 6284.2 | 2513.7 | 25136.9 |

Recommendation

It is evident from the above table that about 502740 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Gumti Nadi in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 25136 metric tonnes. As such 502740 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed From Downstream of Near Village Gumti to Haryana Border. No mineral concession may be granted in small tributaries for proper replenishment of stream.

Dholirao Khalla (Toposheet No. 53F/2)

Dholirao Khalla is the left bank tributary of River Yamuna. Its Total length in Sirmour is about 8 km. It originates from the Village Navi near Rajpura at an elevation of 620 metre.




*Upstream google earth view of Dholirao Khala near Haryana Border*

| Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Average Width of Area Recommended for Mineral Concession (in Metre) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (in Metric Tonn) (60%of total mineral Potential) |
|---|---|---|---|---|
| From Downstream of Village Navi to confluence with river Yamuna | 4.5 | 47 | 211500 | 285525 |

## Present status of mining

Presently no mineral concession has been granted in the beds of this stream.

## Minor Mineral Potential in the River Bed

As the stream cut its course through the boulder beds of Siwalik rocks and this formation is the prominent source of annual deposition in the river beds. During flood season, the water carries heavy sediment load comprising gravels and sand which are deposited in the bed of stream. The following mineral potentials have been calculated based on the %age of each mineral constituent upto a depth of one metre. The annual deposition of minor mineral in the river bed has been calculated by taking into consideration the annual deposition of about 5 Cms.

Table Showing Minor Mineral Potential and Annual Deposition of Dholirao Khala

| Mineral Potential |
|---|

| Boulder 35% (in MT) | River Born Bajri 30% (in MT) | Sand 25% (in MT) | Clay 10% (in MT) | Total Mineable Mineral Potential (in MT) |
|---|---|---|---|---|
| 99933.7 | 85657.5 | 71381 | 28552 | 285525 |
| Annual Deposition 5% | | | | |
| 4996.6 | 4282.8 | 3569 | 1427.6 | 14276 |

Recommendation

It is evident from the above table that about 285525 metric tonnes of different sizes of minor minerals are available upto depth of one metre in the river bed of Dholirao Khalla in the Sirmour District. Similarly, the annual deposition of minor mineral in the river bed is approximately to the tune of 14276 metric tonnes. As such 285525 metric tonnes of minor mineral can safely be lifted from the river bed. It is therefore recommended that mineral concession can be granted in the river bed from downstream of Village Navi near Rajpura. One Mining lease is granted in small tributaries for proper replenishment of stream.

Summary of Recommendations

| Sr. | Name of the River/Stream | Portion of the River/Stream Recommended for Mineral Concession | Length of Area Recommended for Mineral Concession (in Km) | Area Recommended for Mineral Concession (in Sq. metre) | Mineable Minor Mineral Potential (60 % of total mineral Potential) (in Metric Tonne) |
|---|---|---|---|---|---|
| 1 | Yamuna | From Downstream of Confluence with Tons River to Behral near Haryana and Uttar Pradesh Border | 31 | 14818000 | 20004300 |
| 2 | Giri-I | From Downstream of Confluence Khori Ka Nala to Confluence with River Jalal near Dadahu | 64 | 7680000 | 10368000 |
| 3 | Giri-II | From Downstream of Jataun Barrage to Confluence with River Yamuna | 34 | 16932000 | 22858200 |
| 4 | Jalal | From Downstream of Village Odar to Confluence with River Giri | 27 | 1215000 | 1640250 |
| 5 | Bata | From Downstream of Village Uttamwala to Confluence with River Yamuna | 26 | 7540000 | 10179000 |

| | | | | | |
|---|---|---|---|---|---|
| 6 | Nera | From Downstream of Village Bheta to Village Koti | 8.4 | 520800 | 703080 |
| 7 | Tons | From Downstream of village Dhamog to Confluence with Yamuna River | 12.3 | 467400 | 630990 |
| 8 | Markanda | From Downstream of Village Gara to Haryana Border | 21 | 2940000 | 3969000 |
| 9 | Trilokpur Nadi | From Downstream of the Motorable Bridge Near Village Bhudra to Haryana Border | 3.4 | 231200 | 312120 |
| 10 | Salauni Ki Nadi | From Downstream of Village Maholiya Bas to Confluence with River Markanda | 7.6 | 486400 | 656640 |
| 11 | Run Nadi | From Downstream of confluence of Tarapur Ki Nadi to Haryana Border | 9.5 | 855000 | 1154250 |
| 12 | Kandiwala Ki Nadi | From Downstream of Village Kandiwala to Confluence with Run | 5.1 | 346800 | 468180 |
| 13 | Kairi Ka Khala | From Downstream of Village Simbalwala to Confluence with River Markanda | 3.2 | 230400 | 311040 |
| 14 | Somb Nadi | From Downstream of Village Dhakranwala to Haryana Border Near Devwala Village | 5.4 | 518400 | 699840 |
| 15 | Lohgarh Ka Khol | From Downstream of Village Lohgarh to Haryana Border | 6.6 | 316800 | 427680 |
| 16 | Nimbuwala Khala | From Downstream of Village Pir Marusidh to Haryana Border Near Village Palhori | 8.6 | 825600 | 1114560 |
| 17 | Matar Ki Khol | From Downstream of Confluence of Kalhuwala and Brahamanwala streams to Village Matar | 4.6 | 211600 | 285660 |
| 18 | Jagat Ka Nala | From Downstream of village satna to Confluence with Giri | 2.3 | 207000 | 279450 |
| 19 | Katli Ki Nadi | From Downstream of village Karlia to Confluence with Dhagat Ka Khala | 2.2 | 162800 | 219780 |

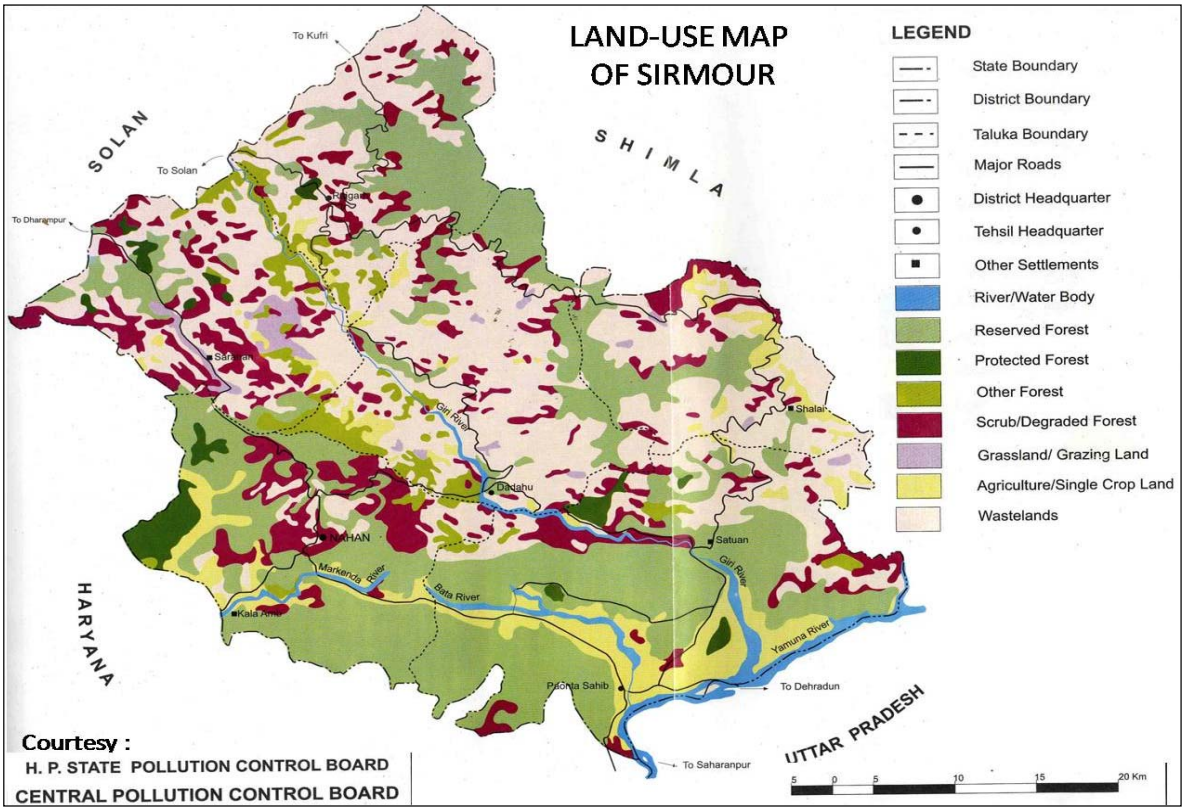
| | | | | | |
|---|---|---|---|---|---|
| 20 | Sudanwala Khala | From Downstream of Confluence of Gariwali Khol to Confluence with river Giri | 3.2 | 249600 | 336960 |
| 21 | Gumti Nadi | From Downstream of Near Village Gumti to Haryana Border | 9.8 | 372400 | 502740 |
| 22 | Dholirao Khalla | From Downstream of Village Navi to confluence with river Yamuna | 4.5 | 211500 | 285525 |

NOTE: - The mineral reserves have been calculated only up to1.00 metre depth however, in general the minor mineral in the form of sand, stone, boulder, bajri is is available at least upto a depth of 03-05 meters. Although there are some portions in the river beds such as channel bars, point bars and central islands where the annual deposition is raising the level of river bed thus causing shifting of the rivers towards banks and causing cutting consequently of banks and at such locations, removal of this material upto the bed level is essential to control the river flow in its central part and to check the bank cutting. While calculating the mineral potentials, the mineral deposits lying in the sub-tributaries of that particular stream/river has not been taken into consideration. Since these mineral deposits are adding annually to the main river, the mineral deposits will be much more.

# 6 LAND UTILIZATION PATTERN IN THE DISTRICT:-

The general land utilization pattern of the District is as given below

| Land Utilization Pattern of the District (in Hects) | |
|---|---|
| Area Under Forest | 48704 |
| Irrigated Area | 14,964 |
| Unirrigated Area | 32,073 |
| Culturable waste (including gauchar and groves) | 72,568 |
| Area not available for cultivation | 54,719 |



Map Showing Land Utilization in district Sirmour

## AGRICULTURE

Agriculture is the main occupation of the people in the district, having different types of soil and agro-climate conditions which are quite suitable for the growing of various types of cereals vegetables, temperate and stone fruits and other crops. The major crops grown in the district are wheat, Paddy, Maize, Barley, Millet. Besides these, potato and a variety of vegetable like green-peas, cauliflower, cabbage, spinach tomatoes, etc. are also grown in the district. The economy is mostly agrarian and majority of population depend on agriculture and activities allied to it for earning their lively hood. The most of the land is un-irrigated and depends upon the rainy season. The part of the lands are irrigated and the irrigation facilities are provided by lifting water from streams, shallow Dug wells and medium to deep tube wells in the valley area. The source of water type of irrigation can be classified into following five classes.

1 Lift irrigation scheme

2 Well used for irrigation
3 Well use for domestic purpose
4 Kuhls
5 Tube wells

The water flows throughout the year in this river. The land holding in the district are small and scattered. The farmers grow more than two crops in a year so as to get maximum production from the land. The crop rotation followed in the district is:

I. Maize- Toria-Wheat
II. Maize-Potato-Potato
III. Maize- Toria-Wheat-BaisakhiMoong
IV Paddy Wheat
V Maize-Wheat

Wheat and Maize are major crops of the district. These are followed by gram, Paddy and other pulses. Besides these, Barley, Ragi, Mustered, Seasmum and Sugarcane are also grown in the district. Peas, Carrot, Cabbage, Ladyfinger, Tomato, Brinjal, Capsicum, Cauliflower, Cucumber, Pumpkin etc. Vegetables are also grown. About 95% of the total cultivable area in district is rain fed. Hence production of the district mainly depends upon rain.

*Table Showing Crop Pattern Surrounding lease area*

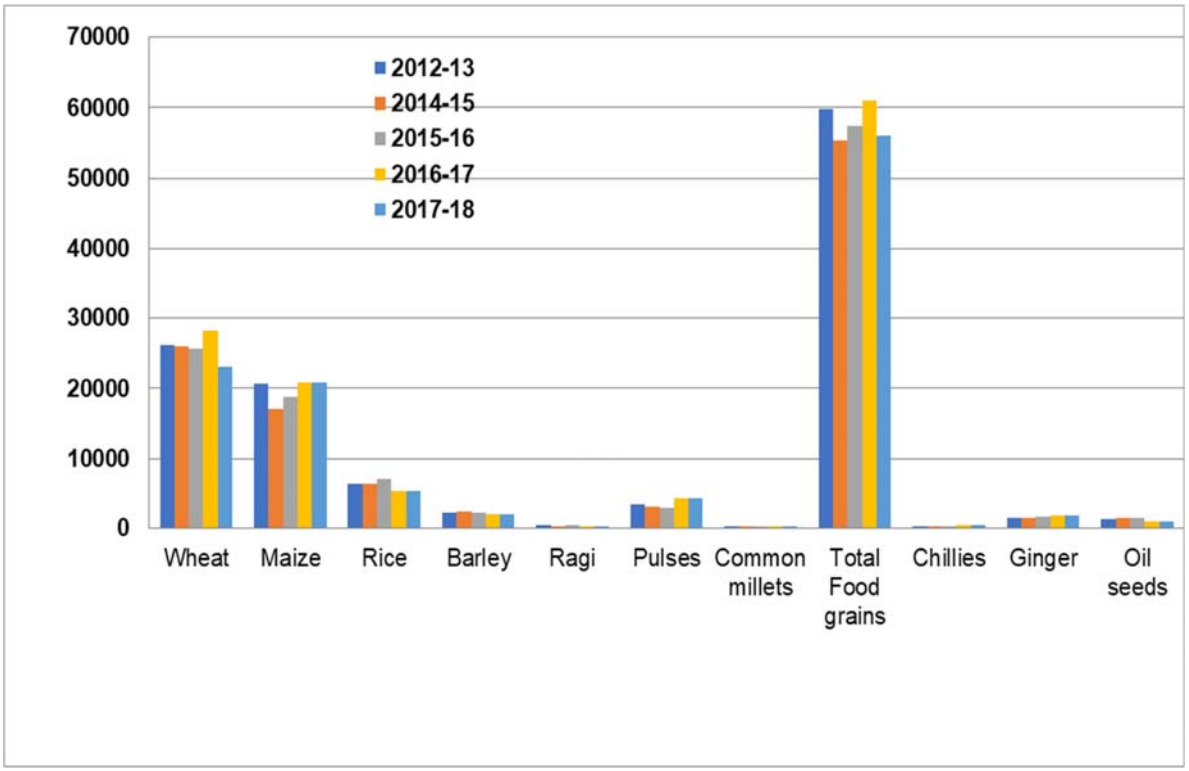
| June | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Maize | | | | Wheat | | | | Maize | | | |
| Maize | | | Toria | | | Wheat | | | Maize | | |
| Maize | | | Patato | | | Wheat | | | Maize | | |
| Maize | | | Potato | | | Potato | | | Maize | | |
| Bhindi | | | | Cauliflower | | | | French Bean/Tomato/brinjal/CapsicumCucubits | | | |
| Sesame | | | | | | Sarson/Raya/G.Sarson | | | | | |
| Ginger/Caucasia/Turmeric | | | | Potato | | Wheat | | | Ginger | | |
| Paddy | | | | | | Wheat | | | | | |
| Paddy | | | | | | Barseem | | | | | |
| Paddy | | | | | | Potato | | | | | |
| Kulthi Mash | | | | | B. Sarson/Raya/G. Sarson/Taramira (Eruca Sativa) | | | | | | |
| Mash | | | | | | Wheat | | | | | |
| Maize+ Mash | | | | | | Wheat | | | | | |
| Arhar | | | | | | | | | | | |

*Table showing area under Different Crops in Hectares*

| Table showing Area under Different Crops in Hectares at Sirmaur District |
|---|

| Year | Wheat | Maize | Rice | Barley | Ragi | Pulses | Common millets | Total Food grains | Chillies | Ginger | Oil seeds |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2012-13 | 26153 | 20708 | 6442 | 2360 | 415 | 3536 | 138 | 59752 | 303 | 1513 | 1303 |
| 2014-15 | 25983 | 17053 | 6336 | 2478 | 276 | 3065 | 116 | 55307 | 217 | 1434 | 1466 |
| 2015-16 | 25662 | 18818 | 7052 | 2319 | 402 | 2974 | 171 | 57398 | 291 | 1687 | 1496 |
| 2016-17 | 28146 | 20816 | 5367 | 1894 | 254 | 4398 | 92 | 60967 | 320 | 1855 | 984 |
| 2017-18 | 23146 | 20816 | 5367 | 1894 | 254 | 4398 | 92 | 55967 | 320 | 1855 | 984 |

*Source: Directorate of Land Records, HP*



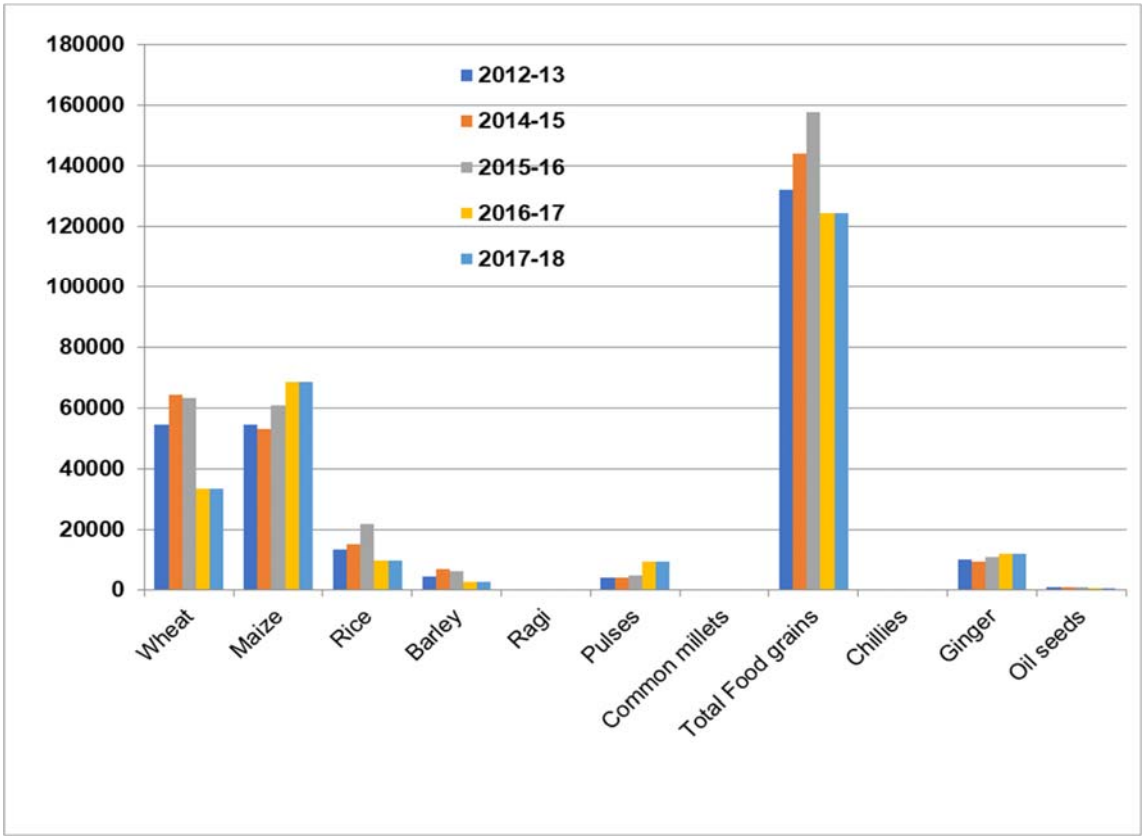

*Graph Showing Area under Different Crops in Hectares*

*Table showing Production of Different Crops in MT*

| Table showing Production of Different Crops in MT at Sirmaur District | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Wheat | Maize | Rice | Barley | Ragi | Pulses | Common millets | Total Food grains | Chillies | Ginger | Oil seeds |
| 2012-13 | 54631 | 54746 | 13673 | 4497 | 302 | 4116 | 93 | 132058 | 119 | 9894 | 828 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014-15 | 64236 | 53222 | 15426 | 6844 | 281 | 4062 | 77 | 144148 | 80 | 9377 | 1015 |
| 2015-16 | 63442 | 60949 | 21975 | 6273 | 281 | 4784 | 112 | 157816 | 113 | 11031 | 1042 |
| 2016-17 | 33575 | 68794 | 9836 | 2723 | 150 | 9186 | 38 | 124302 | 139 | 12134 | 468 |
| 2017-18 | 33575 | 68794 | 9836 | 2723 | 150 | 9186 | 38 | 124302 | 139 | 12134 | 468 |

*Source: Directorate of Land Records, HP*

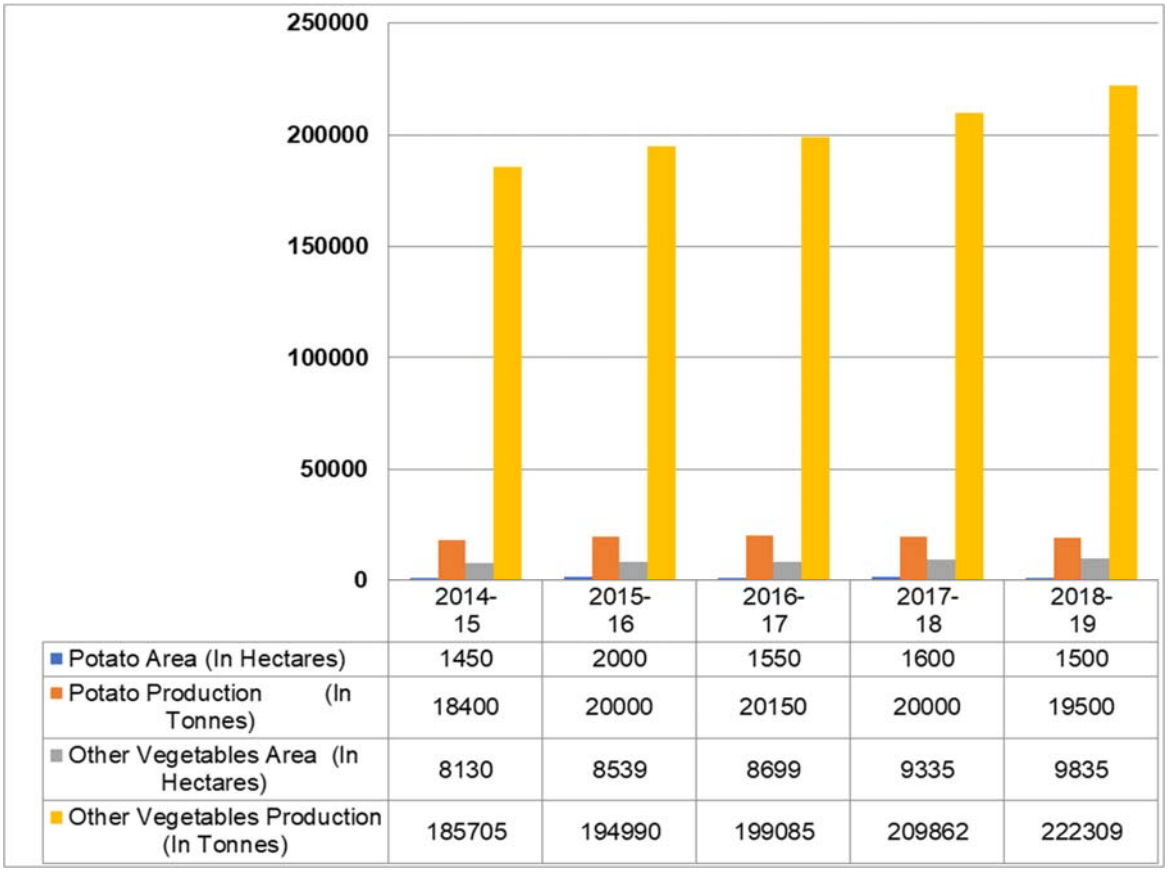



*Graph Showing Production of Different Crops in MT*

*Table showing Area & Production of Vegetables in Tonnes*

| Area & Production of Vegetables (Distt Sirmaur) | | | | |
|---|---|---|---|---|
| Year | Potato | | Other Vegetables | |
| | Area (In Hectares) | Production (In Tonnes) | Area (In Hectares) | Production (In Tonnes) |
| 2014-15 | 1450 | 18400 | 8130 | 185705 |
| 2015-16 | 2000 | 20000 | 8539 | 194990 |
| 2016-17 | 1550 | 20150 | 8699 | 199085 |
| 2017-18 | 1600 | 20000 | 9335 | 209862 |
| 2018-19 | 1500 | 19500 | 9835 | 222309 |

*Source: Directorate of Land Records, HP*




| | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|
| Potato Area (In Hectares) | 1450 | 2000 | 1550 | 1600 | 1500 |
| Potato Production (In Tonnes) | 18400 | 20000 | 20150 | 20000 | 19500 |
| Other Vegetables Area (In Hectares) | 8130 | 8539 | 8699 | 9335 | 9835 |
| Other Vegetables Production (In Tonnes) | 185705 | 194990 | 199085 | 209862 | 222309 |

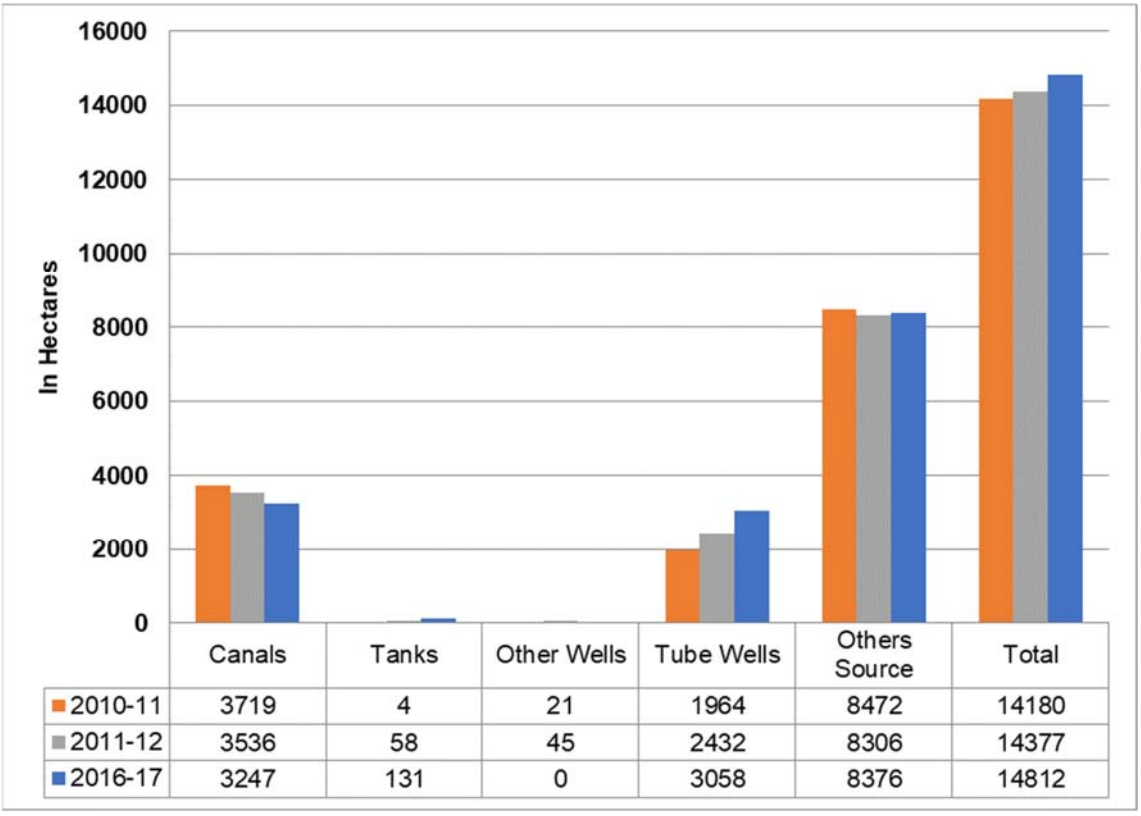
*Graph showing production of vegetables in District Sirmaur*

*Table showing Net Irrigated Area of Sirmaur District by source in Hectares*

Table showing Net Irrigated Area of Sirmaur by source (In Hectares)

| Year | Canals | Tanks | Other Wells | Tube Wells | Others Source | Total |
|---|---|---|---|---|---|---|
| 2010-11 | 3719 | 4 | 21 | 1964 | 8472 | 14180 |
| 2011-12 | 3536 | 58 | 45 | 2432 | 8306 | 14377 |
| 2016-17 | 3247 | 131 | ... | 3058 | 8376 | 14812 |

*Source: Directorate of Land Records, HP*




| | Canals | Tanks | Other Wells | Tube Wells | Others Source | Total |
|---|---|---|---|---|---|---|
| 2010-11 | 3719 | 4 | 21 | 1964 | 8472 | 14180 |
| 2011-12 | 3536 | 58 | 45 | 2432 | 8306 | 14377 |
| 2016-17 | 3247 | 131 | 0 | 3058 | 8376 | 14812 |

*1.16 - Graph Showing Net Irrigated Area of the District*

HORTICULTURE

The topography and agro-climatic conditions of the district are quite suitable for the productions of various fruits. The topography of the district can be grouped into three categories namely High hill areas located at the 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 four categories

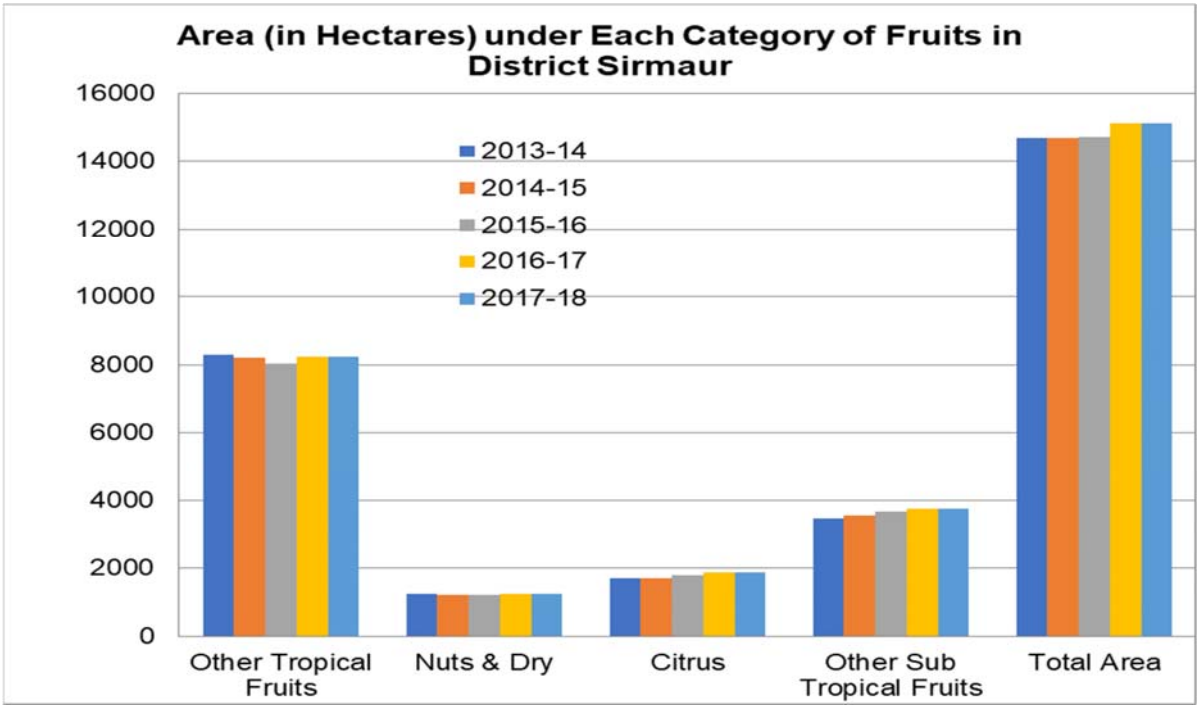
1 Citrus Fruits
2 Sub-tropical Fruits
3 Nuts and dry fruits
4 Other temperate fruits

The following table shows the area under cultivation of each fruit in district

*Table showing Area under Each Category of Fruits in Sirmaur – 2013-2018*

| Table showing Area (In Hectares) under Each Category of Fruits in District Sirmaur | | | | | |
|---|---|---|---|---|---|
| Year | Other Tropical Fruits | Nuts & Dry | Citrus | Other Sub Tropical Fruits | Total Area |
| 2013-14 | 8282 | 1243 | 1697 | 3464 | 14686 |
| 2014-15 | 8194 | 1225 | 1704 | 3547 | 14670 |
| 2015-16 | 8034 | 1216 | 1800 | 3658 | 14708 |
| 2016-17 | 8241 | 1243 | 1869 | 3745 | 15098 |

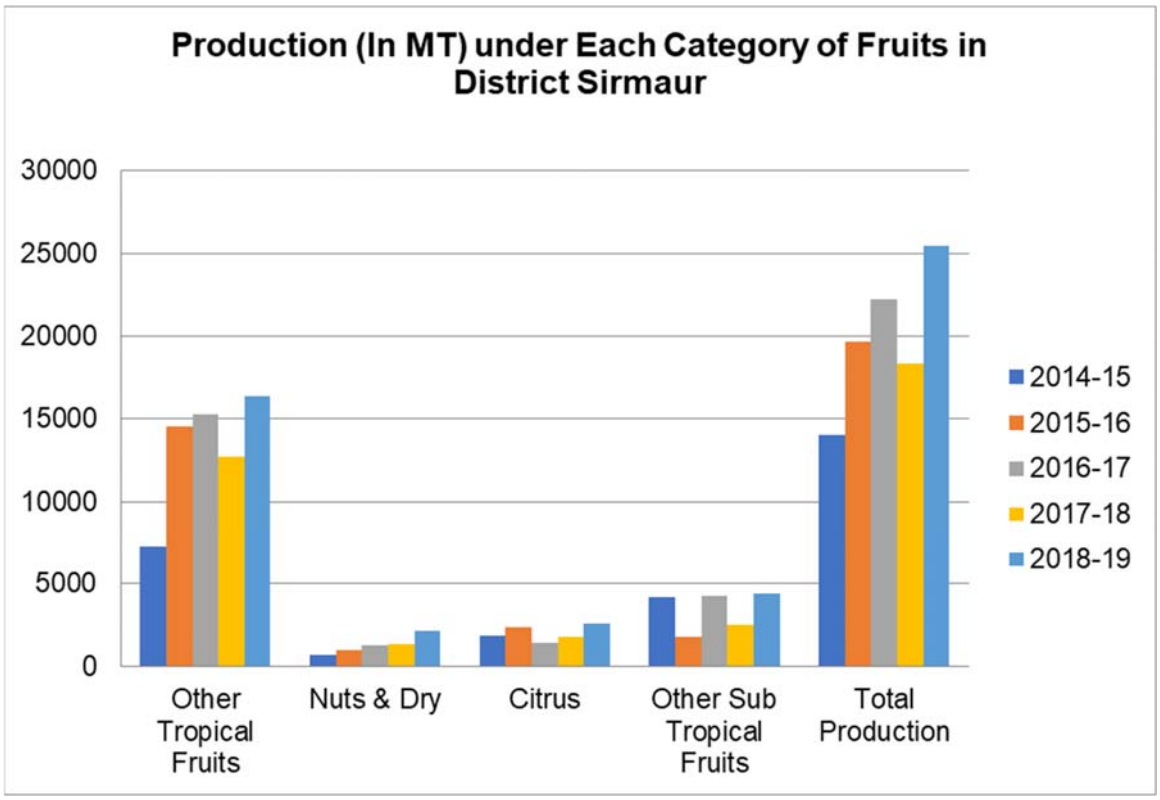
| | | | | | |
|---|---|---|---|---|---|
| 2017-18 | 8241 | 1243 | 1869 | 3745 | 15098 |




*Graph Showing Area under Each Category of Fruits in District*

*Table showing production (In MT) of Each Category of Fruits in District*

| Table showing Production (In MT) under Each Category of Fruits in District Sirmaur | | | | | |
|---|---|---|---|---|---|
| Year | Other Tropical Fruits | Nuts & Dry | Citrus | Other Sub Tropical Fruits | Total Production |
| 2014-15 | 7262 | 714 | 1863 | 4189 | 14028 |
| 2015-16 | 14497 | 1007 | 2382 | 1785 | 19671 |
| 2016-17 | 15274 | 1275 | 1393 | 4222 | 22164 |
| 2017-18 | 12743 | 1359 | 1741 | 2513 | 18356 |
| 2018-19 | 16338 | 2117 | 2572 | 4406 | 25443 |




*Graph Showing Production (In MT) under Each Category of Fruits in District Sirmaur*

ANIMAL HUSBANDRY

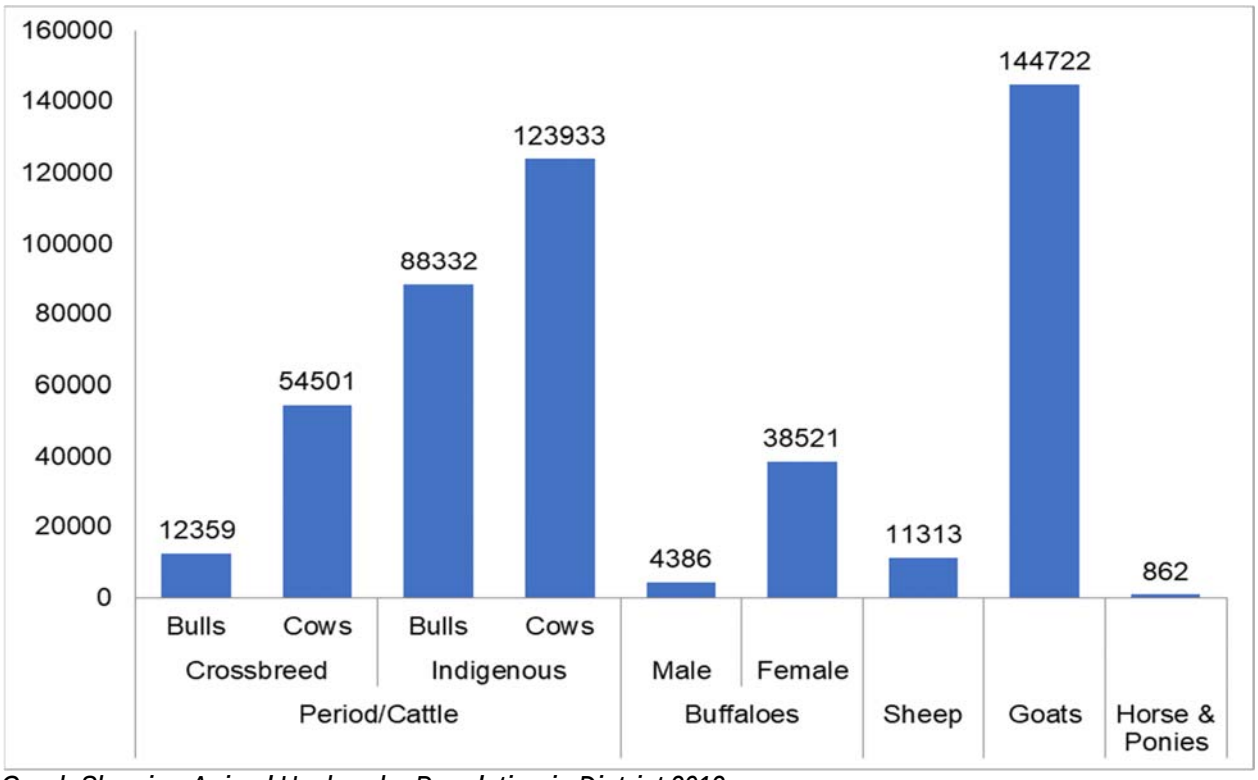
Livestock is the main wealth next to agriculture of the predominant population of the district. The entire terrain in the district is mountainous with high slopes and deep valleys. The development of agriculture, therefore, broadly depends upon the development of animal husbandry. Animal husbandry has several direct and indirect uses for a farmer and so it is an almost integral part of agriculture. To improve the fertility of the soil and to plough the fields, they need animals. Besides this milk and wool is also the need of the people. The people keep the following kind of animals:-

| | | | |
|---|---|---|---|
| 1 | Cow | 2 | Buffalo |
| 3 | Sheep | 4 | Horse and Ponies |
| 5 | Mules | 6 | Donkey |
| 7 | Camel | 8 | Pigs |
| 9 | Dogs | 10 | Poultry |

*Table showing Animal husbandry population of the District*

| Animal Husbandry Population in District Sirmaur | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Period/Cattle | | | | Buffaloes | | Sheep | Goats | Horse & Ponies |
| | Crossbreed | | Indigenous | | | | | | |
| | Bulls | Cows | Bulls | Cows | Male | Female | | | |
| 2012 | 12359 | 54501 | 88332 | 123933 | 4386 | 38521 | 11313 | 144722 | 862 |

Source: Directorate of Animal Husbandry, HP

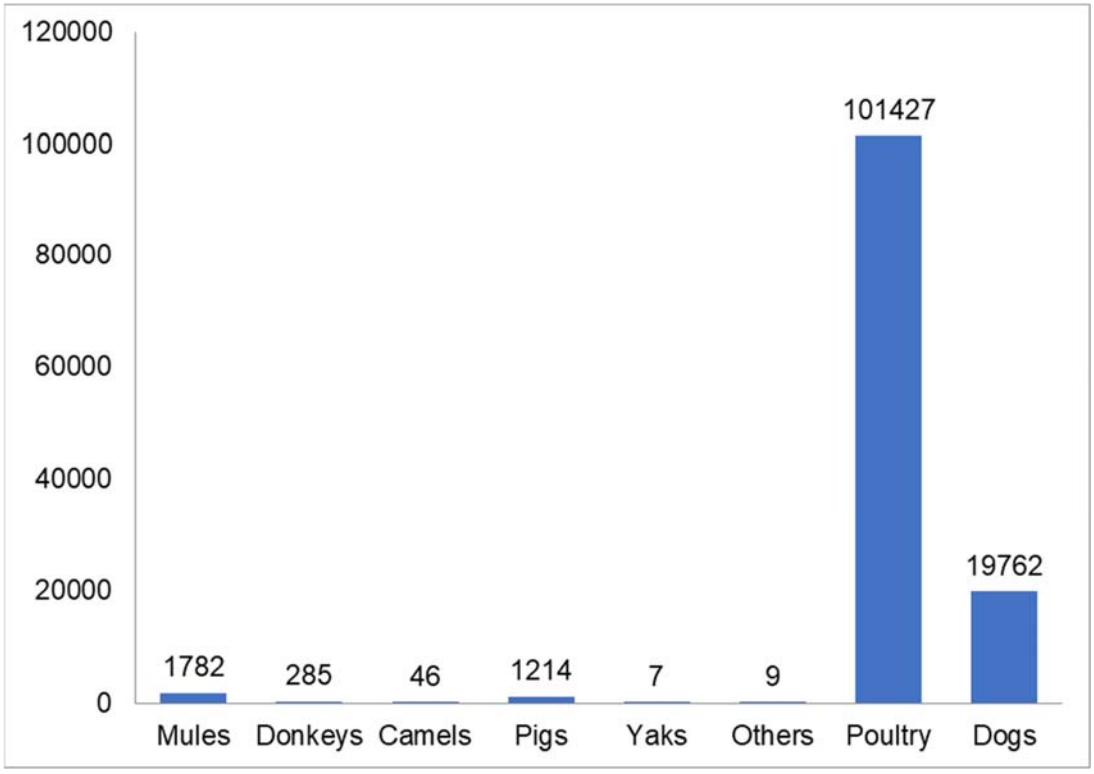



*Graph Showing Animal Husbandry Population in District 2012*

*Table showing other Livestock census of District*

| Other Livestock | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mules | Donkeys | Camels | Pigs | Yaks | Others | Poultry | Dogs |
| 1782 | 285 | 46 | 1214 | 7 | 9 | 101427 | 19762 |

Source: Directorate of Animal Husbandry, HP




*Graph showing other Livestock census of the District*

FISHERIES

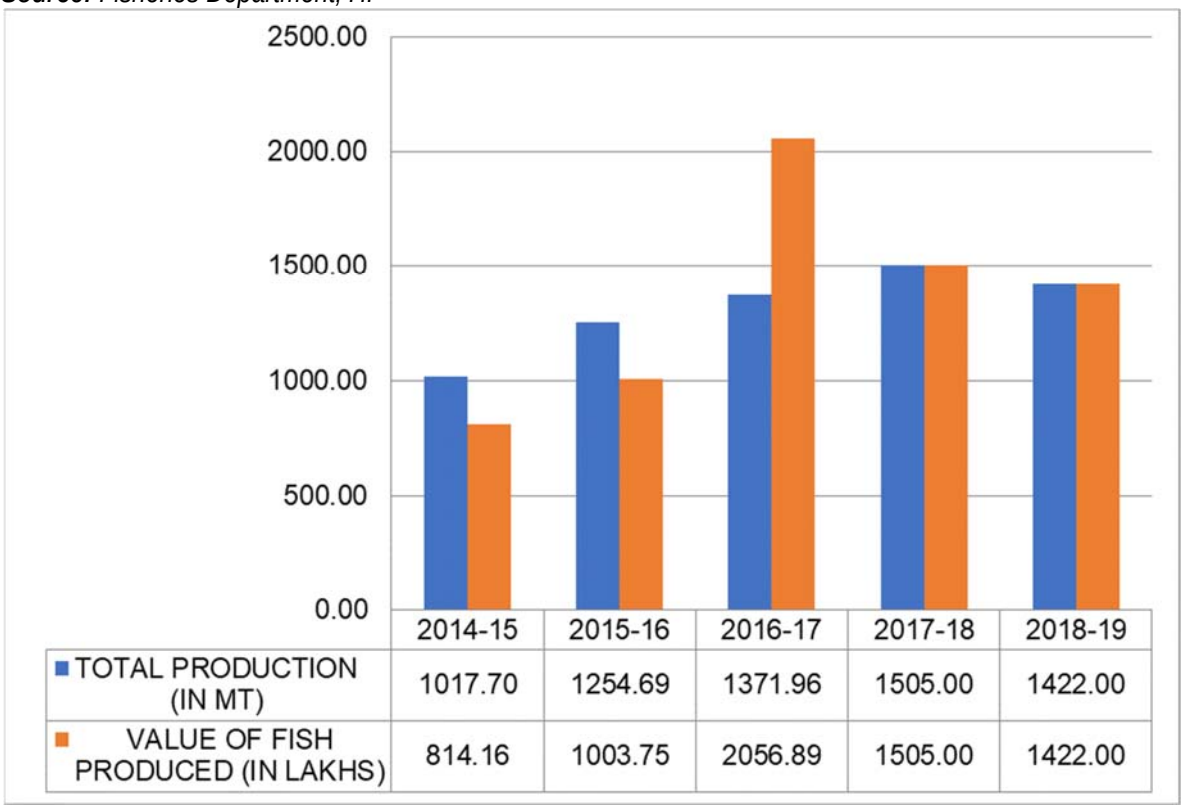
Fisheries play an important role in the rural economy by augmenting food supply, generating employment and raising nutritional contents of food. There is abundance of fishes in rivers and perennial streams. The important species are Mahasheer, Rohu, singhara, Baranguli, Kali Macchi, Kala banas, Bhareli, Mrigal, and Bhunga. Fishery activities in district Sirmour include riverine fisheries and aquaculture. Department of Fisheries, Himachal Pradesh issues annual license to the fishermen for fishing in riverine stretches using cast nets. Main rivers & their tributaries flowing through the district are Giri, Yamuna, Markanda, Roon Bata, Jalal, Nera & Tonnes. Presently 554 licensed fishermen are engaged in fishery profession catching approximately 706 metric tons of fish annually. Culture of fish in ponds is called aquaculture. Although pisciculture is a non- traditional activity, yet depletion of fish in rivers and increasing market demands have forced the Government as well as farmers to think on these lines. There is a vast scope of fishery development in the district. Paonta and to some extent Rajgarh areas are suitable for fish culture. There is also a good scope for running water fish culture in Shillai area.

*Table Showing Annual Production of Fisheries and Its Value of Catch in District*

| Table showing Annual Production of Fisheries at District Sirmaur | | |
|---|---|---|
| YEAR WISE | TOTAL PRODUCTION (IN MT) | VALUE OF FISH PRODUCED (IN LAKHS) |
| 2014-15 | 1017.70 | 814.16 |
| 2015-16 | 1254.69 | 1003.75 |
| 2016-17 | 1371.96 | 2056.89 |
| 2017-18 | 1505.00 | 1505.00 |

| | | |
|---|---|---|
| 2018-19 | 1422.00 | 1422.00 |

*Source: Fisheries Department, HP*




*Graph Showing Annual Production of Fisheries and Its Value of Catch in District*

FLORA

The topography climate and nature of soil is mainly responsible for the growth of various types of trees and shrubs which are important for making the environment of the area most suitable for the survival of living beings. The tree and shrubs grow according to the heights. The Chil is considered the prevailing conifer up to about 1950 meter when it gives place to the Deodar and the blue pines. The forest range between shurbs sal and bamboo forest of the low hills to the fur and alpine forest of the higher elevation. Lowest point of the southern boundary of the district is less than 300 meter above mean sea level and highest range is at an elevation of 5500 meters in the north. The forests grown between these two extremes vary as the elevation. The following most prominent varieties of trees are found in the different elevation.

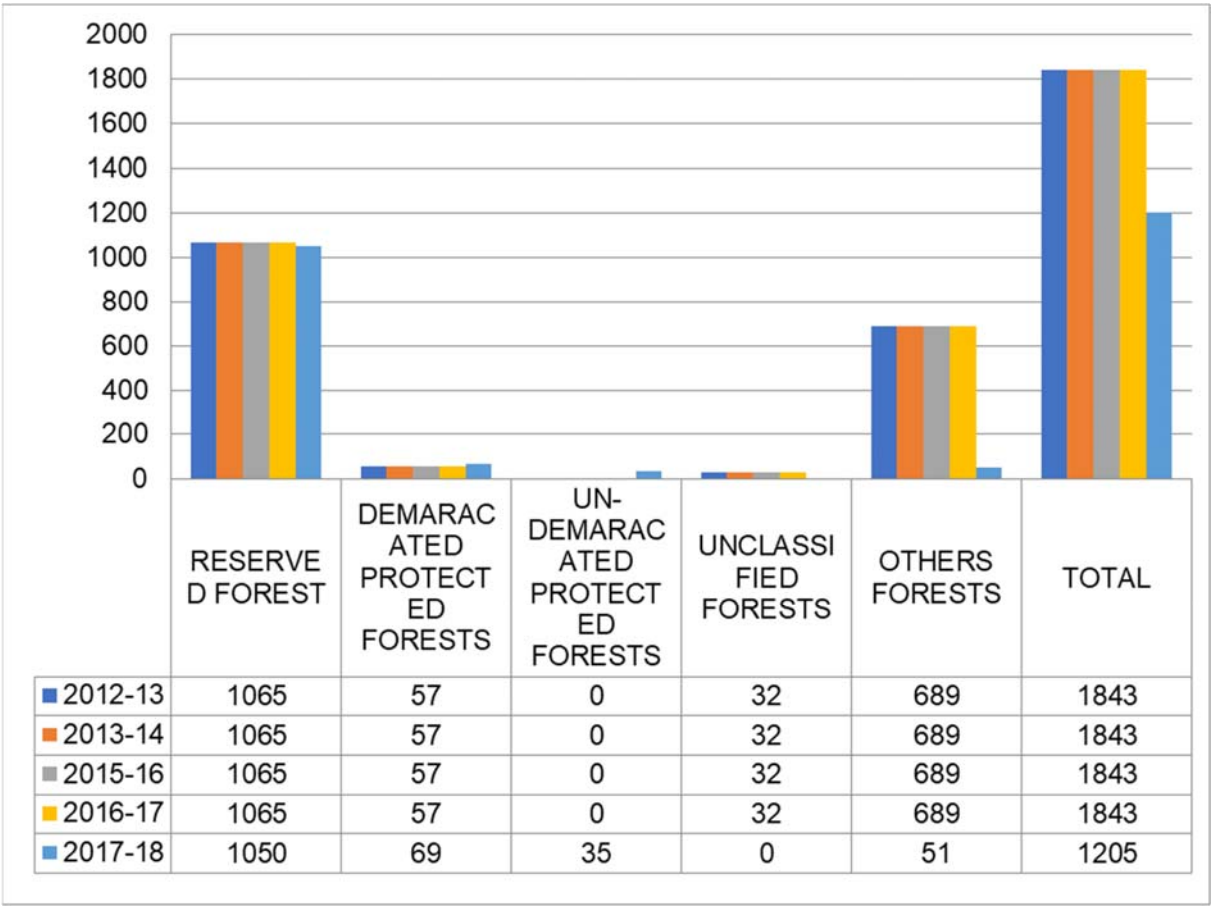
*Table showing most prominent varieties of trees in the area*

| | |
|---|---|
| Mango | (Magni feraindica) |
| Tali | (Dalbergia sisoo)) |
| Pipal | (Ficus religiosa) |
| Behul | (Grewia oppsitifolia) |
| Chil | (Pinus Rose burghi) |
| Simbal | (Bombere malabaricum) |
| Tuni | (Cedrcla toana) |

| | |
|---|---|
| Jamun | (Engenia jambolana |
| Bamboo | |
| Brah | |
| Tos | |
| Broad leaf species | |
| Ber and other bushes | |

*Table showing classification of forest area (in sq.km.) of district*

| CLASSIFICATION OF FOREST AREA (IN SQ.KM.) OF SIRMAUR DISTRICT | | | | | | |
|---|---|---|---|---|---|---|
| YEAR | RESERVED FOREST | DEMARACATED PROTECTED FORESTS | UN-DEMARACATED PROTECTED FORESTS | UNCLASSIFIED FORESTS | OTHERS FORESTS | TOTAL |
| 2012-13 | 1065 | 57 | … | 32 | 689 | 1843 |
| 2013-14 | 1065 | 57 | … | 32 | 689 | 1843 |
| 2015-16 | 1065 | 57 | … | 32 | 689 | 1843 |
| 2016-17 | 1065 | 57 | … | 32 | 689 | 1843 |
| 2017-18 | 1050 | 69 | 35 | … | 51 | 1205 |

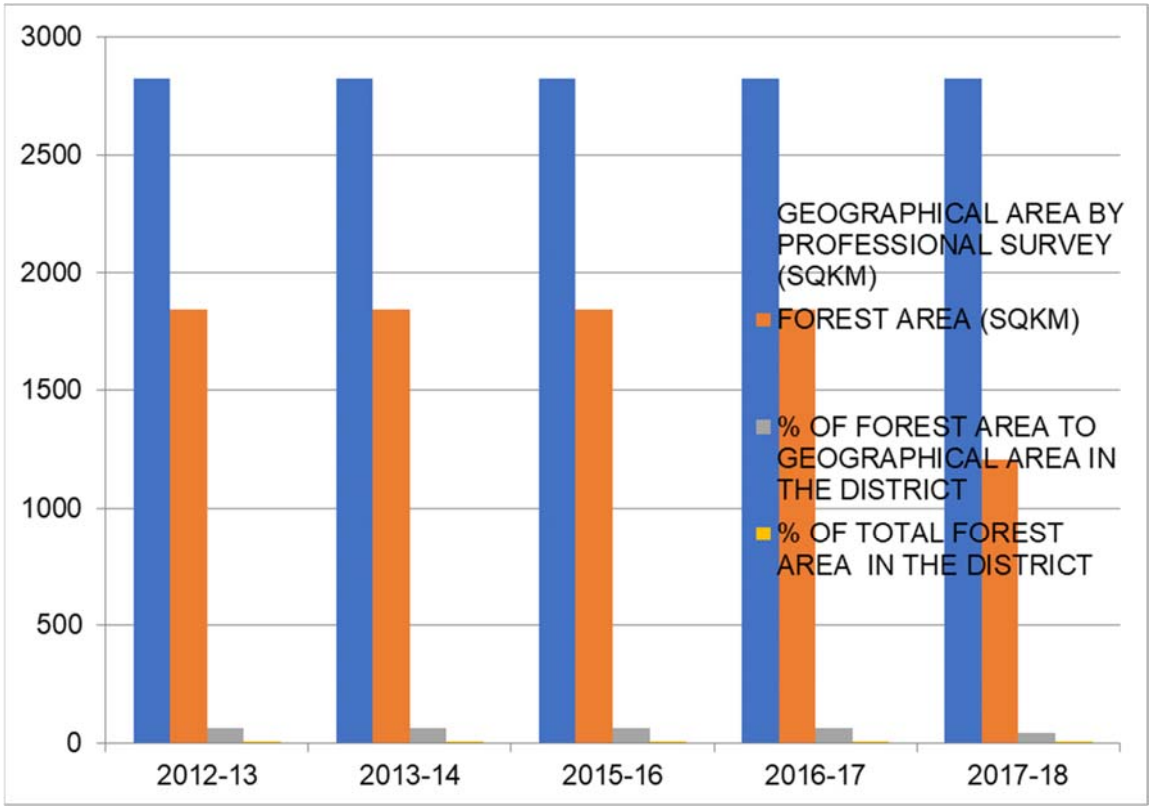



| | RESERVED FOREST | DEMARACATED PROTECTED FORESTS | UN-DEMARACATED PROTECTED FORESTS | UNCLASSIFIED FORESTS | OTHERS FORESTS | TOTAL |
|---|---|---|---|---|---|---|
| 2012-13 | 1065 | 57 | 0 | 32 | 689 | 1843 |
| 2013-14 | 1065 | 57 | 0 | 32 | 689 | 1843 |
| 2015-16 | 1065 | 57 | 0 | 32 | 689 | 1843 |
| 2016-17 | 1065 | 57 | 0 | 32 | 689 | 1843 |
| 2017-18 | 1050 | 69 | 35 | 0 | 51 | 1205 |

*Graph showing classification of forest area (in sq.km.) of district*

*Table showing Geographical forest area (in sq.km.) of district*

| FOREST AREA OF SIRMAUR DISTRICT | | | | |
|---|---|---|---|---|
| YEAR | GEOGRAPHICAL AREA BY PROFESSIONAL SURVEY (SQKM) | FOREST AREA (SQKM) | % OF FOREST AREA TO GEOGRAPHICAL AREA IN THE DISTRICT | % OF TOTAL FOREST AREA IN THE DISTRICT |
| 2012-13 | 2825 | 1843 | 65.2 | 5 |
| 2013-14 | 2825 | 1843 | 65.2 | 5 |
| 2015-16 | 2825 | 1843 | 65.2 | 5 |
| 2016-17 | 2825 | 1843 | 65.2 | 5 |
| 2017-18 | 2825 | 1205 | 42.65 | 3.18 |




*Graph showing Geographical forest area in sq.km. of district Sirmaur*

FAUNA

Common mammals found in the area are Fox, Hare, Jungle cat & common avifauna are crow, common pigeon, Hawk etc. Details of common mammals are given below in the table: -

*Table Showing Details of common mammals*

| | | |
|---|---|---|
| 1 | Black bear | (Selenarctos thebatanus) |
| 2 | Samber | (Cerveus unicolor) |
| 3 | Leopard | (Felis bengalensis) |
| 4 | Musk deer | (moschu mischifarus |
| 5 | Hare | (Lepus nigricoilies) |
| 6 | Fox | (Vaulepus bengalanesis) |
| 7 | Langoor | (Preshytes entellus) |
| 8 | Flying squirrel | (Hylopetus fimbriatus |
| 9 | Bat | (Hippsideros armiger) |
| 10 | Snow leopard | (Panthera unica) |
| 11 | Monkey | (Macaca mulatta) |
| 12 | Barking deer | (Munteicus muntisk) |

| | | |
|---|---|---|
| 13 | Pigeon | (Columbia livia) |
| 14 | Mor | (Payo crisslatus) |
| 15 | Crow | (Crovus splendes) |
| 16 | Parrot | (Prottacula karneri) |
| 17 | House sparrow | (Parser domcrticus) |
| 18 | Cranes | (Grurs species) |
| 19 | Himalayan fly catcher | (Terpsibhous paradisi) |
| 20 | Wood pecker | (Picoides Macer) |

# 7 SURFACE WATER AND GROUND WATER SCENARIO OF THE DISTRICT

## Hydrogeology

Geologically, the rock formations occupying the district range in age from pre-Cambrian to Quaternary period. The generalized geological successionin the district is given below:

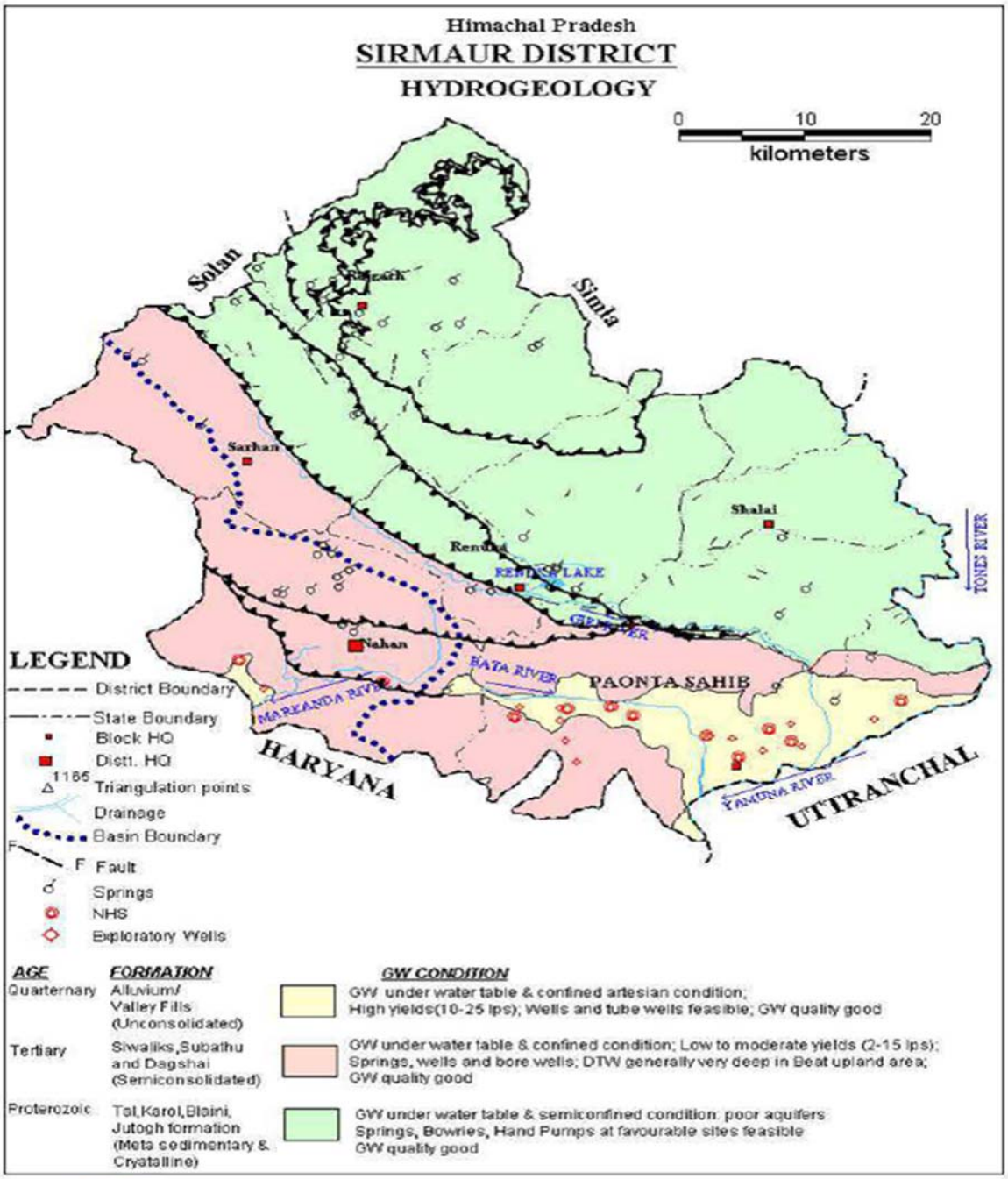
| *Era* | *Period* | *Formation* | *Lithology* |
|---|---|---|---|
| Quaternary | Recent to Pleistocene | Alluvium /valley fills/ Older alluvium | Sand with pebble and clay & multiple cyclic sequence of medium to coarse grained sand with pebble of sandstone and lenses of clay |
| Tertiary | Pliocene – M-Miocene | Siwalik Group | Sandstone, shale, conglomerate, mudstone, clay, gravel & boulder beds beds |
| | L-Miocene – Oligo-Eocen | Kasauli/Dagshai/ Subathu | Grey, purple sandstone, Shale, nodular clay, Shale, Limestone etc. |
| Pre-Tertiary Group | Pemo Carboniferous | Karol/ Infra-Karol, Blainis boulder beds | Limestone, shale, red shale Carbonaceous shale, slate, greywacke, dolomitic limestone. |
| | Devonian | Jaunsar series | Slates schist phyllite, |
| | Pre-Cambrian | Chail series | Slates called Shimla slates |
| | Achaean | Jutogh series | Quartzites, schist and limestone. |

Paonta valley is a narrow tectonic valley or dun and has fluvial and fluvio-glacial sedimentsHydro-geologically, the unconsolidated and semi-consolidated/consolidated rock formations form aquifers in the district. Intergarnular pore spaces in the sedimentary formations and secondary fissured porosityin hard rocks, topographical set up coupled with precipitation in the formof rain and snow, mainly govern occurrence and movement of groundwater. Porous alluvial formation occurring in the valley area froms the most prolific aquifer system where as the sedimentary semi-consolidatedformations and hard rocks

form aquifer of low yield prospect. Major parts of the district are hilly & mountainous with highly dissectedand undulating terrain. These areas are underlain by semi-consolidated andconsolidated hard rocks of Tertiary and pre-Tertiary period. Ground water potential in such areas is very low due to its hydro-geomorphic set up.Springs are the main ground water structures that provide water supply fordomestic and irrigation in major rural and urban areas.Springs are the major ground water sources of water supply in the district.These springs are mainly gravity, contact or fracture type and springslocated along major thrust/faults or structurally weak planes are highyielding. The springs, locally called Chasma, have discharges varyingfrom seepages to 15 litres per second. Bowries, a type dug well, areanother structure constructed in the hill slopes to tap the seepages. Such Bowries are common and observed all southern part of the district. In thelast more than a decade, State Government has drilled shallow bore wellsfitted with hand-pumps to provide domestic water. These hand pumpshave depth up to average 50-60m and have low discharges up to 1 lps.In valley area of Poanta, the ground water occurs in porous unconsolidatedalluvial formation (valley fills) comprising, sand, silt, gravel,cobbles/pebbles etc. Ground water occurs both under phreatic & confinedconditions. Wells and tube wells are the main ground water abstractionstructures. Ground water is being developed in the area by medium to deeptube wells, dug wells, dug cum bored wells. Depth to water level showswide variation from near surface to more then 35 m bgl. Yield of shallowaquifer is moderate with well discharges up to 10 lps.

## Ground Water Resources

Rainfall is the major source recharge to the groundwater body apart from the influent seepage from the rivers, irrigated fields and inflow fromupland areas. The discharge from ground water mainly takes place fromwells and tube wells; effluent seepages of ground water in the form of springs and base flow of streams.

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CONSERVE WATER - SAVE LIFE

# 8 RAINFALL OF THE DISTRICT AND CLIMATIC CONDITIONS

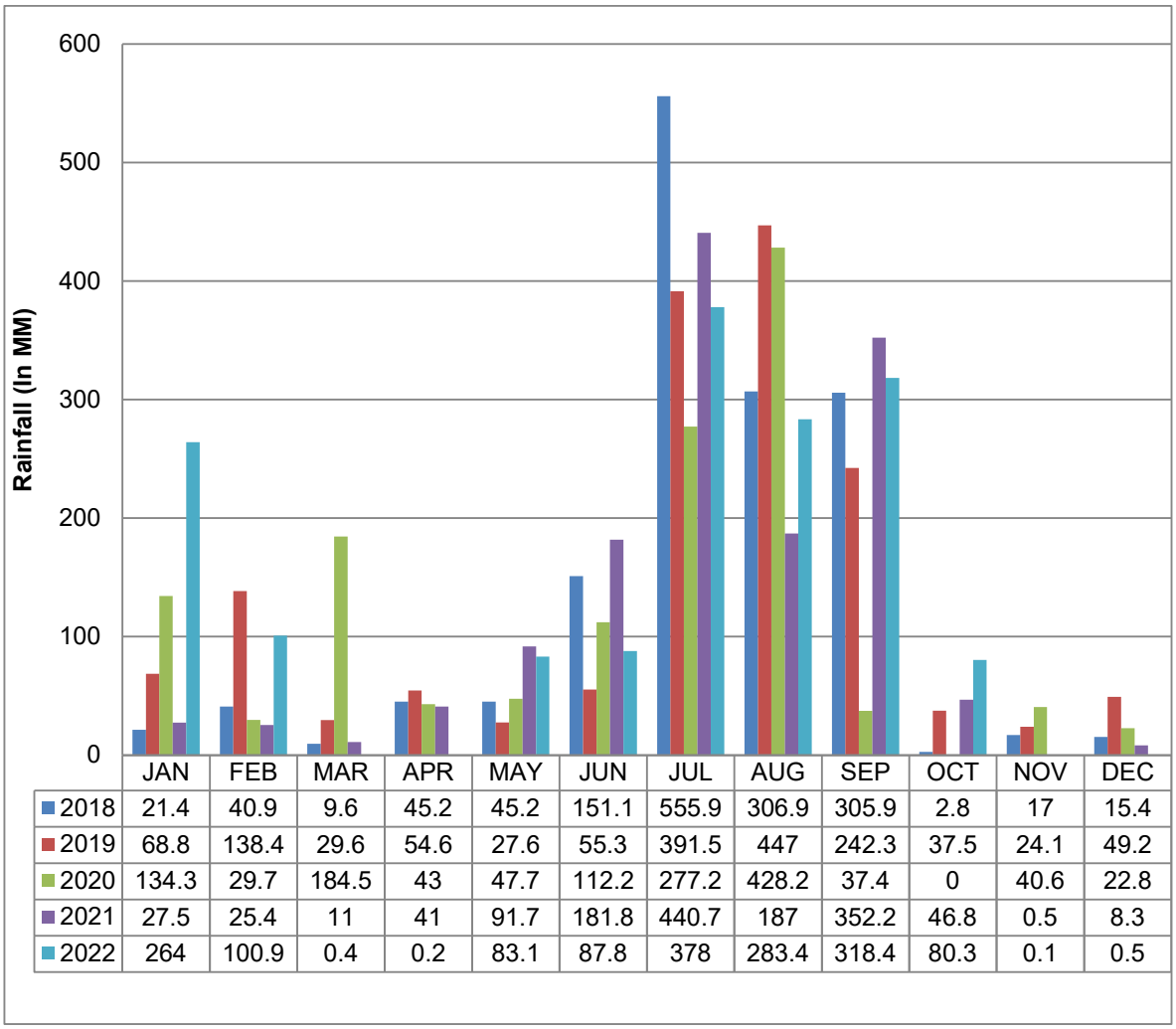
## Rainfall:

The average annual rainfall in the district is 1688.7 mm. It will be seen from Table that the southwest monsoon season is the chief rainy season and rainfall during the southwest monsoon season constitutes to about 71% of the annual rainfall normal. July is the rainiest month. In association with passing western disturbances, some rain occurs in the period January to March. The precipitation in the winter season is mostly in the form of snow in the north-eastern portion of the district at higher elevation. The catchment area receives rainfall due to western disturbances that pass over the north-western part of the country during winter months. Significant precipitation in form of snow is received at higher altitude and rainfall in valleys is received during the winter month. During winter the rains are scarce and extend in between 15th December to 15th February. The following Table shows the quantum of rainfall from year 2018 to 2022 as per IMD.

*Table showing monthly rainfall data of the district*

| SIRMOUR DISTRICT RAINFALL IN MILLIMETERS (R/F) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YEAR | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
| | RAIN FALL (IN mm) | | | | | | | | | | | |
| 2018 | 21.4 | 40.9 | 9.6 | 45.2 | 45.2 | 151.1 | 555.9 | 306.9 | 305.9 | 2.8 | 17 | 15.4 |
| 2019 | 68.8 | 138.4 | 29.6 | 54.6 | 27.6 | 55.3 | 391.5 | 447 | 242.3 | 37.5 | 24.1 | 49.2 |
| 2020 | 134.3 | 29.7 | 184.5 | 43 | 47.7 | 112.2 | 277.2 | 428.2 | 37.4 | 0 | 40.6 | 22.8 |
| 2021 | 27.5 | 25.4 | 11 | 41 | 91.7 | 181.8 | 440.7 | 187 | 352.2 | 46.8 | 0.5 | 8.3 |
| 2022 | 264 | 100.9 | 0.4 | 0.2 | 83.1 | 87.8 | 378 | 283.4 | 318.4 | 80.3 | 0.1 | 0.5 |

*Source: Meteorological Department, Govt. of India*




| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2018 | 21.4 | 40.9 | 9.6 | 45.2 | 45.2 | 151.1 | 555.9 | 306.9 | 305.9 | 2.8 | 17 | 15.4 |
| 2019 | 68.8 | 138.4 | 29.6 | 54.6 | 27.6 | 55.3 | 391.5 | 447 | 242.3 | 37.5 | 24.1 | 49.2 |
| 2020 | 134.3 | 29.7 | 184.5 | 43 | 47.7 | 112.2 | 277.2 | 428.2 | 37.4 | 0 | 40.6 | 22.8 |
| 2021 | 27.5 | 25.4 | 11 | 41 | 91.7 | 181.8 | 440.7 | 187 | 352.2 | 46.8 | 0.5 | 8.3 |
| 2022 | 264 | 100.9 | 0.4 | 0.2 | 83.1 | 87.8 | 378 | 283.4 | 318.4 | 80.3 | 0.1 | 0.5 |

*Graph showing Average monthly rainfall data of the district Sirmaur from year 2018 to 2022*

## Climate of the Area

The climate of this district varies according to the elevation. The terrain is mountainous with deep valleys lying between ranges with varying altitudes. The elevations range between 500 metres in the southwestern border to about 2500 metres as one proceeds towards the northeast with individual peaks going higher. The portion of the district, beyond the Giri river is a mostly wild mountainous region. The summer is from March to about the end of June. The southwest monsoon season starts thereafter and lasts till about mid-September. Mid-September to November constitutes the post-monsoon season and December to February is the winter season.

*Table Showing the Climate conditions of the District*

| Maximum & Minimum Temperature of District Sirmaur (Meteorological Centre-Nahan ) | | | | | | |
|---|---|---|---|---|---|---|
| MONTH | YEAR | 2014 | 2015 | 2016 | 2017 | 2018 |
| JAN | MAX | 16.4 | 20.3 | 21.3 | 21.8 | 17.7 |
| | MIN | 4.6 | 1.7 | 3.9 | 3 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| FEB | MAX | 18.3 | 25.1 | 26.5 | 25.3 | 20.8 |
| | MIN | 5.2 | 8.5 | 5.8 | 6.3 | 9.2 |
| MAR | MAX | 22.6 | 28.7 | 29.7 | 33.3 | 26.4 |
| | MIN | 9.4 | 8.4 | 8.3 | 2.7 | 16.9 |
| APR | MAX | 28.3 | 31.8 | 35.8 | 35 | 30.2 |
| | MIN | 13.7 | 12.7 | 13.1 | 12.9 | 16.9 |
| MAY | MAX | 31.9 | 37.4 | 37.2 | 36.3 | 33.3 |
| | MIN | 18 | 16.2 | 15.2 | 14.5 | 20.2 |
| JUN | MAX | 35 | 36.8 | 36.2 | 37.2 | 20.4 |
| | MIN | 20.9 | 17.3 | 15.7 | 15.9 | 20.4 |
| JUL | MAX | 28.5 | 31.1 | 30.6 | 31.8 | 28.7 |
| | MIN | 17.9 | 17.4 | 18.1 | 19.3 | 18.9 |
| AUG | MAX | 28.6 | 29.8 | 31.8 | 29.3 | 27 |
| | MIN | 18.1 | 18.4 | 18.7 | 16.5 | 18.5 |
| SEP | MAX | 27.4 | 32.2 | 30.4 | 31.5 | 26.9 |
| | MIN | 16.2 | 17.1 | 16.9 | 15.4 | 16.8 |
| OCT | MAX | 25.9 | 31.2 | 28.9 | 30.6 | 26.7 |
| | MIN | 12.7 | 11.6 | 13.8 | 12.9 | 13.7 |
| NOV | MAX | 22.7 | 25.2 | 27.3 | 24.7 | 22 |
| | MIN | 9 | 12.4 | 10 | 8.5 | 9.9 |
| DEC | MAX | 18.2 | 24.7 | 23.2 | 22.5 | 18.1 |
| | MIN | 5.2 | 5.2 | 6.7 | 6.9 | 3.6 |

*Source: Meteorological Department, Govt. of India*

# 9 DETAILS OF THE MINING LEASES IN THE DISTRICT:

Table showing list of mining leases granted

Detail Of Mining Leases Granted For Stone Crusher And Free Sale Of Minerals In Sirmour District

| Sr. No. | Name & Address of Leases | Khasra No./ Location | Area (in Hects. / Bighas) | Type (riverbed/hillslope) | Period in years (w.e.f. to ___) | Location Coordinates | Approved Quantity Per Annum in MT |
|---|---|---|---|---|---|---|---|
| | Paonta Sahib Sub-Division (Open/Free Sale Mining Leases) | | | | | | |
| 1 | Shri Dalip Singh, S/o Shri Narayan Singh, R/o Village Chandni, P.O. Bharog Baneri, Tehsil Kamrau, District Sirmour, H.P. | 58/1 (Mehat) | 2.11 | Riverbed | 28.08.2021 to 27.08.2026 | Latitude-30$^0$'35'19.33"N to 30°35'11.65"N Longitude 77$^0$ 28' 54.04"E to 77° 29'7.59" E | Annual Production-45000 MT<br>Total Production-225000 MT |
| 2 | Sh. Manjeet Singh R/O House No. 171/11, Devi Nagar, Tehsil Paonta Sahib, District Sirmour, H.P. | 64,65, 68/1 and 69 (Devi Nagar) | 4.2 | Riverbed | 16.06.2021 to 15.06.2026 | Latitude-30$^0$25'57.5" N to 30$^0$25'54.36"N Longitude-77$^0$38'13.88''E to 77$^0$38'16.3" E | Annual production-56250 MT<br>Total Production-281250 MT |
| 3 | Shri Shakun Gupta, M/S Shakumbhri Minerals, R/O Gupta House, Hindu Ashram Road Nahan, Distt. Sirmaur, HP | 291/221/189/1 (Sainwala Mubarkpur) | 3.7 | Riverbed | 03.02.2022 to 02.02.2027 | Latitude-30$^0$30'10.60"N to 30$^0$30'4.75" N Longitude-77$^0$31'22.10"E to 77$^0$31'25.60"E | Annual Production-84771 MT<br>Total Production-423855 MT |
| 4 | M/s A-One Enterprises H. NO. 603 Sec-7 Panchkula Haryana | 368/288/239/2 (Bangran) | 4.24 | Riverbed | 01.05.2022 to 31.05.2027 | Latitude-30$^0$29'46.0" N to 30$^0$29'33.0" N Longitude-77$^0$40'43.4" | Annual Production-94386 MT Total Productio |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | E to 77$^{0}$40'53.5" E | n- 471930 MT |
| 5 | M/s Bala Sundri Mines & Minerals, (Partners S/Shri Manish Kumar, Rishi Kumar & Naveen Kumar) House No. 169/19, Ward No. 5, Yamuna Vihar, Shamsherpur, Tehsil Paonta Sahib, District Sirmour, H.P. | 137/122/75/1 (Bhatrog) | 3.09 | -do- | 16.11.2023 to 15.11.2028 | Latitude- 30$^{032'34.50"}$N to 30$^{032'28.74"}$N Longitude- 77$^{039'48.14"}$E to 77$^{039'58.90"}$E | Annual Production- 57706 MT Total Production- 288530 MT |
| 6 | Shri Randeep Singh, S/o Shri Gurbaksh, Village Masruwala, P.O. Dulmana, Tehsil & District Hanumangarh, Rajasthan | 936, 998 Min (Bhagani) | 1-10-40 Hect. & 53-56-40 Hect. | Riverbed | 26.09.2023 to 25.09.2038 | Latitude- 30$^{0}$29'18.74"N to 30$^{0}$28'17.15"N Longitude- 77$^{0}$45'06.19"E to 77$^{0}$43'35.27"E | Annual Production- 797676 MT Total Production- 3988380 MT |
| | Pachhad Sub-Division | | | | | | |
| 7 | Smt. Sharmila Kanwar, W/o Shri Hitender Kanwar, Village Mohana, P.O. Naina Tikkar, Tehsil Pachhad, District Sirmour, H.P. | 295/254 (Sachali) | 1.03 | Hill Slope | 31.03.2021 to 30.03.2026 | Latitude- 30$^{046'46"}$N Longitude- 77$^{0}$ $^{7'36"}$E | Annual production- First year- 3375MT Second year- 3704MT Third year- 3704MT Forth year- 5000MT |

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| | | | | | | | Fifth year-7530 MT Total production-23313 MT |
| 8 | Shri Rachin Chaudhary and Rakesh Mohan, VPO Nauni, Tehsil & District Solan, H.P. | 1245/1040/844 (Mangarh) | 1.84 | Hill Slope | 19.05.2023 to 18.05.2028 | Latitude-30$^0$45'12"N Longitude-77$^0$14'31"E | Annual production- First year-7100 MT Second year-8000 MT Third year-8150 MT Forth year-8975 MT Fifth year-8975 MT Total production-41200 MT |
| Mining Leases For Stone crushers | | | | | | | |
| | | | | | | | |
| Sr. No. | Name & Address of Leases | Khasra No. | Area in Bighas /Hects. Only) | Type (riverbed/hillslope) | Period in years (w.e.f to ___) | Location Coordinates | Approved Quantity Per Annum in MT |
| | Paonta Sahib Sub-Division | | | | | | |
| 9 | Sh. Ashish Kumar S/o Sh. Anand Kumar 186/10 Devinagar Paonta Sahib (H.P) | 379/250/228/1 (old no. 250/228/4/4) & 379/250/228/2 (old no. 250/228/4/3) (Bangran) | 18.04 | Riverbed | 06.10.2022 to 05.10.2032 | Latitude-30$^0$29'30.59''N to 30°29'02.17''N Longitude-77$^0$41'13.70''E to 77°40'52.39''E | Annual Production-101250 MT Total Production-506250MT |
| 10 | M/s All Stone Mine & Minerals Vill. Rampur Ghat, P.O. Shivpur, Teh. Paonta Sahib, Distt.Sirmour | 431/322/1 (Mohkampur Nawada) | 19.84 | -do- | 25.02.2016 to 24.02.2031 | Latitude: 300 28'9.17''N to 300 28'54''N Longitude: 77041'13.94''E to | Mining plan valid from 25/2/2021 to 24/2/2026 Annual production- 344925 |

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| | (H.P) | | | | | 77041'06''E | MT Total production- 1724625 MT |
| 11 | M/S Chandel Associates, 186/10, Devi Nagar, Paonta Sahib, Distt. Sirmour | 1248/1026/912/2 & 911/679/3 (Manpur Devra) | 9.5 | -do- | 20.11.2009 to 19.11.2024 | Latitude- 30°27'48.64"N to 30°28'5.38" N Longitude- 77°41'19.19"E to 77°41'26.85"E | Annual Production- 184226 MT Total Production- 921130 MT |
| 12 | Sh. Ashok Goyal- Naveen Goyal, Prop. Goyal Crushing Company, Vill. Manpur Devra, teh. Paonta Sahib distt. Sirmour (H.P) | 638/613/590/188/1 (Mohkampur Nawada) | 10.4 | -do- | 08.02.11 to 07.02.2026 | Latitude- 30°28'45.00"N to 30°28'41.93''N Longitude- 77°41'14''E to 77°41'13.68''E | Annual Production- 118463MT Total Production- 592315MT |
| 13 | M/S Dev Raj Stone Crusher, Vill. Manpur Devra. Paonta Sahib Distt. Sirmour H.P | 638/613/590/188/7 (Mohkampur Nawada) | 9.53 | -do- | 03.02.11 to 02.02.2026 | Latitude- 30°29'02.00" N to 30°28'57.00''N Longitude- 77°40'59.00''E to 77°41'07.00''E | Annual Production- 195615MT Total Production- 978075MT |
| 14 | M/s Sab Giri Industries, Prop. Shri Madan Mohan Sharma, S/o Shri Natha Ram Sharma, H. No. 214, Ward No. 10, Devi | 638/613/590/188/8 (Mohkampur Nawada) | 4.91 | -do- | 24.05.2013 to 23.05.2028 | Latitude- 30°29'15.0" N to 30°28'57.0" N Longitude- 77°41'06.4" E to 77°41'07.0" E | Annual Production- 111899MT Total Production- 559495MT |

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| 15 | M/s Sab Giri Industries, Prop. Shri Madan Mohan Sharma, S/o Shri Natha Ram Sharma, H. No. 214, Ward No. 10, Devi Nagar, Tehsil Paonta Sahib, District Sirmour, H.P. | 336 (Kunja) | 2.68 | -do- | 11.03.2020 to 10.03.2035 | Latitude-30$^0$26'3.80" N to 30$^0$25'59.12 "N Longitude-77$^0$38'40.31 "E to 77$^0$38'39.04 "E | Annual Production-62493MT Total production-312465 |
| 16 | M/s Shubh Giri Industries Works, Prop: Smt. Shubhlata Sharma, W/o Shri Madan Mohan Sharma, R/o Devi Nagar, Ward. No. 10, PO & Tehsil Paonta Sahib, District Sirmour, H.P. | 638/613/590/188/3 (Mohkampur Nawada) | 3.75 | -do- | 17.01.2018 to 16.01.2033 | Latitude-30$^0$28'06.55 "N to 30$^0$28'7.59" N Longitude-77$^0$41'19.15 "E to 77$^0$41'22.16 "E | Annual Production-85048 MT Total Production-425240 MT |
| 17 | M/s Shubh Giri Industries Works, Prop: Smt. Shubhlata Sharma, W/o Shri Madan Mohan Sharma, R/o Devi Nagar, Ward. | 638/613/590/188/10 (Mohkampur Nawada) | 5.91 | -do- | 24.01.2018 to 23.01.2033 | Latitude-30$^0$28'06.55 "N to 30$^0$28'7.59" N Longitude-77$^0$41'19.15 "E to 77$^0$41'22.16 "E | Annual Production-122625 Total Production-613125 |
| 18 | M/s Shubhgiri Crushing Company, Prop. Shri Madan Mohan Sharma, Devinagar, | 288/239/2/1 (Bangran) | 13.51 | -do- | 17.01.2018 to 16.01.2033 | Latitude-30$^0$29'52.37 "N to 30$^0$29'51.2" N Longitude-77$^0$40'38.15 " E to 77$^0$40'43.61 | Annual Production-310255MT Total Production-1551275 |

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| | PO Rampur Ghat, Tehsil Paonta Sahib, District Sirmour, H.P. | | | | | ”E | MT |
| 19 | M/s Mahender Singh & Company, Prop: Shri Mahender Singh, S/o Shri Sohan Singh, Devi Nagar, Tehsil Paonta Sahib, District Sirmour H.P. | 283/13/1 (Kunja) | 10.2 | -do- | 15.10.10 to 14.10.2025 | Latitude-30⁰28’06.55”N to 30⁰28’7.59” N Longitude-77⁰41’19.15”E to 77⁰41’22.16”E | Annual Production-170235 MT Total Production-851175 MT |
| 20 | Smt. Meera Chandel, W/o Dr. Hakam Chand Chandel Devinagar Paonta Sahib distt. Sirmour H.P | 66,67,68/2 & 72/2 (Devi Nagar) | 4.7 | -do- | 28.12.2012 to 27.12.2027 | Latitude-30⁰29’01.1” N to 30⁰28’56.79”N Longitude-77⁰40’55.28”E to 77⁰41’8.37” E | Annual Production-81000 MT Total Production-405000MT |
| 21 | Sh. Gajender Pal Singh, S/o Surain Singh . 519 Vijay Park Extension, Dehardun (UK) | 637/613/188/ & 639/563/480/1 (Mohkampur Nawada) | 10.4 | -do- | 02.11.10 to 01.11.2025 | Latitude-30⁰28’12.36”N to 30⁰28’29.63”N Longitude-77⁰41’4.05” E to 77⁰41’16.49”E | Annual Production-213750 MT Total Production-1068750 MT |

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| 22 | M/S Yamuna Mines and Minerals, C/o Sh. Sher Singh Negi Ho. No. 133/E Canal road Heerpur Paonta Sahib Distt. Sirmour H.P | 273/256/155/2/1 (New/Changed Khasra No. 319/273/256/155/2/1), 255/155/2, 254/155/4/2 (New/Changed Khasra No. 330/254/15584/2), 254/155/2/2 (New/Changes Khasra No.330/254/155/2/2) (Gojai Addain) | 3.75 | -do- | 08.10.15 to 07.10.2030 | Latitude- 30°30'11.92''N TO 30°30'9.81'' N Longitude- 77°46'43.97''E to 77°46'29.38''E | Annual Production-80000 MT Total Production- 400000 MT |
| 23 | M/s Guru Nanak Dev St. Cr. Vill. Nawada, The. Paonta Sahib Distt. Sirmour H.P., | 586/473/184, 587/473/184 & 588/477/188 (Mohkampur Nawada) | 5.25 | -do- | 29.09.2022 to 28.09.2032 | Latitude- 30°28'47.80"N to 30°29'2.32" N Longitude- 77°41'6.11" E to 77°41'10.86"E | Annual Production- 119700MT Total Production- 598500MT |
| 24 | Sh. Anil Sharma Sirmour Industries, Vill. Bata Mandi Tehsil Paonta Sahib Distt. Sirmour H.P | 953/2/2 (Bata mandi) | 3.52 | -do- | 26.09.16 to 25.09.2031 | Latitude- 30°25'25.3" N to 30°25'27.8" N Longitude- 77°34'52.4" E To 77°34'49.6" E | Annual Production-72000 Total Production-360000 |
| 25 | M/s Shirgul Mine & Minerals, Vill. Bhatorg Tehsil Paonta Sahib | 24, 25, 29, 23/1, 27/1 & 30/2 (Bhatrog) | 4.00 | -do- | 27.02.2018 to 26.02.2033 | Latitude- 30°32'43.31"N to 30°32'39.29"N Longitude- 77°39'20.97"E to 77°39'28.42"E | Annual Production- 74514 MT Total Production- 372570 MT |
| 26 | M/s Neelgiri Stone Cr. Vill. Bhatorg Tehsil Paonta | 58, 59, 69, &70 (Bhatrog) | 2.75 | -do- | 26.02.18 to 25.02.2033 | Latitude- 30°32'34.95"N Longitude- 77°39'43.38 | Annual Production- 62496 MT Total |

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| | Sahib, Distt. Sirmour H.P | | | | | ”E | Production-312480 MT |
| 27 | M/s Himalayan Stone Crusher, Vill. Manpurdevra Tehsil Paonta Sahib distt. Sirmour H.P | 288/239/2/2/1 (Mohkampur Nawada) | 6.25 | -do- | 22.05.18 to 21.05.2033 | Latitude-30⁰29’44.55”N to 30⁰29’37.27”N Longitude-77⁰40’46.40”E to 77⁰40’50.73”E | Annual Production-142246 MT Total Production-711230 MT |
| 28 | Sh. Vivek Gautam, Vill. Manpur Devra Tehsil Paonta Sahib Distt. Sirmour H.P | 836/598/1, 962/668/607, 963/608, 964/668 & 966/668 (Manpur Devra) | 2.16 | -do- | 22.03.2018 to 21.03.2033 | Latitude-30⁰27’29.65”N to 30⁰27’55.00”N Longitude-77⁰42’19.57”E to 77⁰42’18.27”E | Annual Production-44800 MT Total Production-224000 MT |
| 29 | Sh. Mahabir Singh, Vill. Gojar adain Tehsil Paonta Sahib Distt. Sirmour H.P | 270/252/155/92/1 & 253/155 (Gojjar Addain) | 7.2 | -do- | 25.10.2016 to 24.10.2031 | Latitude-30⁰29’52.16”N To 30⁰30’3.37”N Longitude-77⁰45’54.91”E to 77⁰46’14.16”E | Annual Production-128020 MT Total Production-640100MT |

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| 30 | M/s Yaksha Industries, (Partner S/Shri Nirmal Sharma, Ravi Dogra & Manjeet Kumar), VPO Rampurghat, Tehsil Paonta Sahib, District Sirmour H.P. | 907/679 (new khasra no. assigned as 907/679/274) 908/679, 673/674 (actual khasra no. assigned as 1447/729/270), 729/270/4 (new khasra no. assigned as 1448/729/270), 729/270/5 (new khasra no. assigned as 1449/729/270) and 1019/909/1 (Manpur Devra) | 4.25 | -do- | 09.03.18 to 08.03.33 | Latitude- 30$^0$28'23.78 "N Longitude- 77$^0$41'32.35 "E | Annual Production- 104681MT Total Production- 523405MT |
| 31 | Smt. Seema Devi, D/o Shri Ghunger Ram, Prop. M/s Krishna Stone Crusher, R/o Ward No. 8, Mohalla Nalagarh, Tehsil Nalagarh, District Solan, H.P. | 961/668/607 (Manpur Devra) | 3.75 | -do- | 31.08.2019 to 30.08.2034 | Latitude- 30$^0$27'28.0" N to 30$^0$27'24.9" N Longitude- 77$^0$42'06.92 "E to 77$^0$42'02.2" E | Annual Production-77625 Total Production- 388125 MT |
| 32 | M/s Bitta Stone Crusher, (Partnership Firm, Partners S/Shri Salinder Singh, Sarwan Singh, Amarjeet Singh & Smt. Babita Dubey) Village Kunja Matralion, Tehsil Paonta | 335/2 (Kunja) | 2.05 | -do- | 04.07.19 to 03.07.34 | Latitude- 30$^0$26'0.20" N to 30$^0$25'52.45 "N Longitude- 77$^0$38'27.44 "E to 77$^0$38'13.75 "E | Annual Production-56800 MT Total Production- 284000 MT |

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| | Sahib, District Sirmour, H.P. | | | | | | |
| 33 | M/s Akhilesh Enterprises, Partners Smt. Malini Jung & Kirnesh Jung, Village Ganguwala, PO Batamandi, Tehsil Paonta Sahib, District Sirmour, H.P. | 53/2 (Ganguwala) | 2 | -do- | 28.01.2021 to 27.01.2031 | Latitude-30$^0$25'29.6'' N to 30$^0$25'25.5'' N Longitude-77035'11.4'' E To 77035'10.3'' E | Annual Production-40400MT Total Production-202000MT |
| 34 | Sh. Ashutosh Gupta Vill. Nawada, Teh. Paonta Sahib Distt. Sirmour H.P. | 162/1/2 (New Khasra No. assigned 400/162/2) (Phoolpur) | 4.75 | -do- | 09.08.2021 to 08.08.36 | Latitude-30$^0$30'44.3" N to 30$^0$30'39.8" N Longitude-77$^0$40'03.6" E to 77$^0$40'07.2" E | Annual Production-97200 MT Total Production- 486000 MT |
| 35 | M/s Shiva Mines & Minerals Industries, Partner Shri Jagdeep Singh Tomar & Parvesh Kumar, R/o 194/4, Durga Colony, Tehsil Paonta Sahib, District Sirmour, Himachal Pradesh | 377/250/228/1 (Bangran) | 3.66 | -do- | 24.06.22 to 23.06.37 | Latitude-30$^0$30'01.0" N to 30$^0$30'9.91" N Longitude-77$^0$40'31.19 "E to 77$^0$40'38.6" E | Annual Production-67500 MT Total Production-337500MT |

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| 36 | Sh. Kirnesh Jung Prop: M/s Arikesh Stone Crusher Village Ganguwala, P.O. Bata Mandi, Tehsil Paonta Sahib. | 245/113/1, 246/113/1, 247/113/1, 248/113/1 & 249/113 (Kotri) | 4-88-05 | -do- | 22.01.2017 to 21.01.2032 | Latitude-30°29'55.84"N to 30°30'05.70"N Longitude-77°31'36.19"E To 77°31'55.11"E | Annual Production-79380MT Total Production-396900MT |
| 37 | M/s Rocklime & Allied Products, Prop Shri Anil Kumar Sharma, Rampur Ghat, Tehsil Paonta Sahib, District Sirmour, H.P. | 238/168& 242/169 (Bangran) | 1.91 | -do- | 04.01.2023 to 03.01.2028 | Latitude-30°29'24" N to 30°29'29"N Longitude-77°40'53"E to 77°40'57"E | Annual Production-43425 MT Total Production-217125 MT |
| 38 | Shri Dev Raj Negi, S/o Shri Singha Singh, Village Gojjar, Tehsil Paonta Sahib, District Sirmour, H.P. | 35 (Govt. Land Auction Quarry) (Gojjar Adain) | 5-37-05 | -do- | 03.06.2019 to 02.06.2029 | Latitude-30°29'55.54" N to 30°29'46.18"N Longitude-77°45'40.44"E to 77°45'47.02"E | Annual Production-95625 MT Total Production- 478125 MT |
| 39 | Shri Lakhwinder Singh, S/o Sh. Jagmel Singh, Falt No.824, Phase-2, Mohali, Punjab. | 330/94, 331/94, 324/94, 323/94, 322/94 & 301/207 (Guruwala) | 4.2 | -do- | 05.08.2016 to 04.08.2031 | Latitude-30°27'52.63" N to 30°28'1.28" N Longitude-77°42'34.08"E to 77°42'45.73"E | Annual Production- 94934 MT Total Production-474670 MT |
| 40 | M/S Goyal Brothers Stone Crusher Prop. Narender Kumar R/o Chawal Tehsil and Distt Solan HP | 288/239/2/2/2/2 (Bangran) | 5 | -do- | 23.06.18 to 22.06.33 | Latitude-30°29'41.63"N to 30°29'23.33"N Longitude-77°40'52.11"E to 77°40'54.18"E | Annual Production- 106983 MT Total Production-534915 MT |

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| 41 | M/s A-One Minerals H. NO. 603 Sec-7 Panchkula Haryana | 368/288/239/1 (Bangran) | 4.64 | -do- | 01.06.22 to 31.05.37 | Latitude- 30°29'46.0" N to 30°29'33.0" N Longitude- 77°40'43.4" E to 77°40'53.5" E | Annual Production- 44640 MT Total Production- 223200MT |
| 42 | Radha Mines H.No. 165 Ward No. 4 Badri pur Teh. Paonta Sahib Distt. Sirmour H.P. | 175, 219/176, 218/176, 177/1, 247/221/1, 248/221, 220/178, 179, 180, 223/181/1, 255/227 & 256/227 (Bangran) | 3.5 | -do- | 06.06.22 to 05.06.37 | Latitude- 30°29'39.16 "N to 30°29'50.77 "N Longitude- 77°40'52.20 "E to 77°40'58.50 "E | Annual production-42300 MT Total production- 211500 MT |
| 43 | Vinayak Minerals H.No. 165 Ward No. 4 Badri pur Teh. Paonta Sahib Distt. Sirmour H.P. | 1450/901/674/2, 1451/901/674, 1452/901/674, 1453/901/674, 900/674/2 (Manpur Devra) | 2.54 | -do- | 06.06.22 to 05.06.37 | Latitude- 30°28'27.82 "N to 30°28'37.63 "N Longitude- 77°41'24.31 "E to 77°41'31.42 "E | Annual Production- 57373 MT Total Production- 286865 MT |
| 44 | M/s A.R. Crushing Company, Partnership Firm (Partners S/Shri Rajesh Garg & Ashutosh Gupta), House No. 165/4, Badripur, Tehsil Paonta Sahib, District Sirmour, H.P. | 368/288/239/3/1 (Bangran) | 3.92 | -do- | 22.07.2022 to 21.07.2037 | Latitude- 30°29'46" N to 30°29'43"N Longitude- 77°40'43.4" E to 77°40'56.1" E | Annual Production- 75735 MT Total Production- 378675 MT |

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| 45 | Mohkam Singh, Vill. Suraj Pur Tehsil Paonta Sahib Distt. Sirmour H.P. | 346/160/1 & 347/160/1 (Surajpur) | 2.34 | -do- | 05.03.22 to 04.03.2032 | Latitude-30$^0$26'47.16"N To 30$^0$26'33.91"N Longitude-77$^0$34'51.60"E to 77$^0$34'46.06"E | Annual Production-47732 MT Total Production-238660 MT |
| 46 | Shri Amrik Singh, Prop. M/s Neelkanth Stone Crusher, Haripur Tohana, Tehsil Paonta Sahib, District Sirmour, H.P. | 1559/937/1/2, 1445/938/1, 1444/938/2, 2235/1443/938, 2234/1443/938, 2589/1442/938 & 1439/938/1/2 (Bhgani) | 3.08 | -do- | 06.05.22 to 5.5.37 | Latitude-30$^0$28'45.70" N to 30$^0$28'36.91"N Longitude-77$^0$44'23.98"E to 77$^0$44'17.65"E | Annual Production- 62447 MT Total Production-312235 MT |
| 47 | Jag Mohan, Vill. Chanyan Bakyori P.O. Bhellon Tehsil Pachhad. Distt. Sirmour H.P | 97/2, 98, 99, 100, 101, 102 & 103 (Rajban) | 2.14 | -do- | 06.12.21 to 05.12.31 | Latitude-30031'14.24"N to 30031'29.06"N Longitude-77040'13.03"E to 77040'15.55"E | Annual Production-48150MT Total Production-240750 MT |
| 48 | M/s Hare Krishna Stone Crusher Prop. Shri Aachman Kapoor, House No. 180/46, Surya Colony, Ward No. 6, Paonta Sahib | 804 & 805/2 (Bhuppur-II) | 3.51 | -do- | 22.08.2022 to 21.08.2037 | Latitude-30$^0$25'58.54"N to 30$^0$26'4.76" N Longitude-77$^0$36'31.16"E to 77$^0$36'39.89"E | Annual Production-61619MT TOTAL Production-308095MT |
| 49 | M/s Shiv Shakti Stone Crusher, Partnership Firm Partners S/Shri Pawan Kumar, Yash | 636/613/590/2, 612/590/188 & 183 (Mohkampur Nawada) | 2.51 | -do- | 10.10.2022 to 09.10.2037 | Latitude-30$^0$29'44.55" N to 30$^0$29'37.27"N Longitude-77$^0$40'46.40"E to 77$^0$40'50.73 | Annual Production- 76950 MT Total Production-384750 MT |

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| | Pal & Aman Sharma, Village Amargarh, P.O. Puruwala-Kanshipur, Tehsil Paonta Sahib, District Sirmour, H.P. | | | | | ”E | |
| 50 | M/s Omkara Stone Crusher, (Partners S/Shri Rahul Chaudhary & Gurdeep Singh) Ward No. 6, Y-Point, Tehsil Paonta Sahib, District Sirmour H.P. | 431/322/3 (Mohkampur Nawada) | 04-23-15 | -do- | 01.11.2023 to 30.10.2038 | Latitude-30$^{027'}$20.78” N to 30$^{027'37.93}$”N Longitude-77$^{0}$40’43.39 ”E to 77$^{0}$40'56.72 ”E | Annual Production- 74025 MT Total Production- 370125 MT |
| 51 | M/s R.J. Associates, (Partners S/Shri Jaspal S/o Shri Dalipa Ram, Jaibir S/o Shri Kuldeep Singh, Rajesh Gupta S/o Shri Prem Chand, Gopal Chand S/o Shri Sadhu Ram & Smt. Preeti Garg W/o Shri Kamal Garg), Village Nawada, P.O. Shivpur, Tehsil Paonta Sahib, District Sirmour, H.P. | 640/563/480/2 (Mohkampur Nawada) | 3.916 | -do- | 30.01.2023 to 29.01.2033 | Latitude-30$^{0}$27’57.71 ” N to 30$^{0}$28’9.62” N Longitude-77$^{0}$41’05.06 ”E to 77$^{0}$41’16.83 ”E | Annual Production- 68899MT Total Production- 344495 MT |

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| 52 | Smt. Meera Chandel, W/o Shri Hakam Chand, Village Mohkampur Nawada, 186/10, Devi Nagar, PO Rampur Ghat, Tehsil Paonta Sahib, District Sirmour, H.P. | 13/1 (Mohkampur Nawada) | 4.18 | -do- | 12.02.2024 to 11.02.2039 | Latitude-30$^0$29'01.1" N to 30$^0$28'56.79 "N Longitude-77$^0$40'55.28 "E to 77$^0$41'8.37" E | Annual Production-81000MT Total Production-405000MT |
| 53 | M/s Mahadev Mines & Minerals (Partnership firm Partners S/Shri Sanjay Kumar Gupta, Vansh Gupta & Keshav Gupta) House No. 257, Ward No. 8, Tehsil Paonta Sahib, District Sirmour, H.P. | 953/1/1 (Upsampada Batamandi) | 03-55-94 | -do- | 24.01.2024 to 23.01.2039 | Latitude-30$^0$25'9.99" N to 30$^0$25'0.64" N Longitude-77$^0$34'38.98 "E to 77$^0$34'.45"E | Annual Production- 67500 MT Total Production-337500 MT |
| | Nahan Sub-Division | | | | | | Approved Quantity Per Annum in MT |
| 54 | M/s Shiva Stone Crusher, Vill. Churan Tehsil Nahan Distt. Sirmour H.P. | 61/3, 172/62/3, 174/63/2, 68/2 & 67/2 (Churan) | 4.01 | Hill Slope | 20.11.15 to 19.11.2030 | Latitude-30°32'26.61 "N Longitude-77°15'0.2"E | Annual Production-First year-52417MT Second year-52419 MT Third year-52913MT Forth year-51920MT Fifth year- |

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|---|---|---|---|---|---|---|---|
| | | | | | | | 54210MT Total Production- 263879MT |
| 55 | M/s Maa Vaishno Stone Crusher, Vill. Salani Tehsil Nahan distt. Sirmour H.P | 141/3/2 (Mohalia Katola | 3.84 | Riverbed | 04.04.12 to 03.04.2027 | Latitude- $30^{0}33'21.28$"N to $30^{0}33'36.72$"N Longitude- $77^{0}15'0.2$"E to $77^{0}15'08.43$"E | Annual Production- 47035MT Total Production- 235125MT |
| 56 | M/s Tribhuvan Stone cr. Prop. Sh. Ram Pal Malik, VPO Shambhuwala, Tehsil Nahan | 213/43/1 (Bankala) | 3.4 | Riverbed | 31.10.19 to 30.10.24 | Latitude- $30^{031'}23.15$" N to $30^{03130.87"}$N Longitude- $77^{019'}57.21$" E to $77^{019'39.78"}$E | Annual Production- 70762MT Total Production- 353810 MT |
| 57 | M/s Shiv Shakti Stone Crusher, Prop. Shri Naib Singh, Village Mirzapur, Tehsil Narayangarh, Haryana | 46 & 47/1 (Meerpur Kotla) | 4.17 | -do- | 16.10.18 to 15.10.33 | Latitude- 30°32'26.61"N Longitude- 77°15'0.2"E | Annual Production- 25984 MT |
| | Pachhad Sub-Division | | | | | | |
| 58 | M/s Sunshine Minerals & Stone Cr., Prop. Smt. Pushpa Mittal, W/o Shri Ram Kumar Mittal, R/o Village Kalaghat, PO Kotla Panjola, Tehsil Pachhad, District Sirmour, H.P. | 40/18/1 & 40/20/1 (Ganiyar) | 0.41 | Hill slope | 31.10.09 to 30.10.2024 | Latitude- $30^{050'27"}$N to $30^{050'31"}$N Longitude- $77^{009'31.4"}$E to $77^{09'29.5"}$E | Annual Production- First year- 19085MT Second year- 19050MT Third Year- 20115MT Forth Year- 20060MT Fifth Year- 19120MT Total Productio |

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|---|---|---|---|---|---|---|---|
| | | | | | | | n-97430MT |
| 59 | Shri Ashok Gupta, S/o Late Shri Ram Rattan Gupta, R/o Sapatu Road, Dharampur, District Solan, H.P. | 7/2. (Talehari Madho) | 1.08 | Hill Slope | 15.09.2019 to 14.09.2029 | Latitude-30°49'50.66"N Longitude-77°06'00"E | First year-35268 Second year-35127 Third year-35229 Forth Year-35373 Fifth year-35503 Total Production-176500 MT |
| 60 | M/s G.B. Grit Udhyog, Unit--II, Village Tamani, P.O. Tikkri Kathar, Tehsil Pachhad, Distt. Sirmour, H.P. | 218/2 (Tikkari Kathar) | 0.91 | Hill slope | 10.09.15 to 09.09.2030 | Laitude-30°45'12.79"N Longitude-77°02'15. | First Year-26180MT Second Year-17680 MT Third Year-9180MT Forth Year-25620MT Fifth Year-17120MT Total Production-95780 MT |
| 61 | Rajneesh Verma, R/o B-29 Set.2 New Shimla | 1302/409/1/2, 1302/409/2/2 & 1249/408/2/2 (Kaliyon Pab) | 1.68 | Hill slope | 22.04.22 to 21.04.32 | Latitude-30°58'33.67"N to 30°58'35.64"N Longitude-77°19'10.44"E to 77°19'13.10"E | Annual Production- 30000 MT Total Production-150000 MT |

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|---|---|---|---|---|---|---|---|
| 62 | Shri Rajneesh Verma, S/o Shri Kewal Ram Verma, R/o B-29 Opposite Dawat Restaurant, Sector-2, New Shimla-171009, H.P. | 1514/1326/704/1/2 & 1514/1326/704/2/2 (Kaliyon Pab) | 0.58 | Hill slope | 22.04.22 to 21.04.27 | Latitude-30$^{058'6.25"}$N to 30$^{058'8.58"}$N Longitude-77$^{019'26.93"}$E to 77$^{019'32.58"}$E | First year-16830 MT Second year-20000 MT Third Year-20000 MT Forth Year-20000 MT Fifth Year-19999 MT Total production-96829 MT |
| 63 | Shri Rajender Singh Vill. Nei Neti Tehsil Rajgarh Distt. Sirmour H.P. | 275/249/61/1/2 (Lana Ro) | 0.1 | Hill slope | 10.03.22 to 09.03.32 | Latitude-30054'48.1" N to 30054'44.1" N Longitude-77014'21.5" E to 77014'16.1" E | Annual Production-8280 MT Total Production- 41400 MT |
| 64 | M/s G.B. Grit Udhyog, Village Tamani, P.O. Tikkri Kathar, Tehsil Pachhad, Distt. Sirmour, H.P. | 213/2 (Tikkari Kathar) | 0.98 | Hill slope | 11.09.15 to 10.09.30 | Laitude-30°45'12.79 "N Longitude-77°02'15. | Annual Production- 23300 MT Total Production-116500 |
| 65 | Smt. Lalita Devi, W/o Sh. Paramjeet Chauahn, House No.1022, Ground Floor, Sector 39-B Chandigarh | 281/232/222/180/2 (Matahan) | 0.93 | Hill slope | 19.06.2023 to 18.06.2033 | Latitude-30042'56.56 "N to 30043'064" N Longitude-77013'28.31 "E to 77013'32.5" E | Annual Production-first year-9000 MT Second Year-10000MT Third year-11000MT Forth year-11000MT Fifth year-14000MT Total Productio |

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|---|---|---|---|---|---|---|---|
| | | | | | | | n-55000MT |
| 66 | M/S Sangam Stone Crusher (Partner Sh. Shiv kumar, S/o Sh Ravi Chand and Sh Ravi Verma, S/o Sh Daya Ram) Village DeviryaDasana, PO Thakur ThakurDewara, Tehsil Pachhad | 456/45,457/45&458/45/3 (Devaria Dasana) | 0.25 | Hill Slope | 03.02.2022 to 01.02.2037 | Latitude-30$^{050'27}$"N to 30$^{050'31}$"N Longitude-77$^{009'31.4}$"E to 77$^{09'29.5}$"E | Annual production-60150MT |
| | Shillai Sub-Division | | | | | | |
| 67 | Shri Anil Kalta, Prop. M/s Jai Devi Stone Crusher, Kalta Niwas, Ground Floor, Sharma Building, North Oak, Sanjauli, Shimla-171006 | 5075/3613/3 (Shillai) | 2.86 | Hill slope | 01.08.16 to 31.07.31 | Latitude-31°39'48.87"N to 31°39'54.44"N Longitude-77°40'52.47"E to 77°40'56.05"E | Annual production - 25000MT |
| 68 | Shri Yashpal Chauhan, S/o Shri Rattan Singh Chauhan, Prop. M/s Yash Stone Crusher, C/o Gitika Niwas, Pari Mahal, Kasumpti, Shimla-171009 | 470/425/407/110/2 (Shillai) | 0.5 | Hill slope | 04.12.20 to 03.12.35 | Latitude 30°45'53.80"N Longitude-77°37'59.9"E | Annual Production-first year-12000MT Second Year-12000MT Third year-12000MT Forth year-14000MT Fifth year-14000MT Total Productio |

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|---|---|---|---|---|---|---|---|
| | | | | | | | n-64000MT |

Detail Of Mining Leases Granted For Major Mineral i.e. Limestone In Sirmour District

| Sr. No. | Name & Address | Khasra No. /Location | Area (Hects Only) | Period in years (valid upto) | Coordinates | Approved Quantity Per Annum in MT |
|---|---|---|---|---|---|---|
| 1 | M/s Balbir Singh-Supa Ram, Village & P.O. Kamrau, Tehsil Paonta Sahib, District Sirmour (H.P.) | 1927/1904 (Banour) | 0.83 | 01.09.2052 | Latitude30°35'17.53" N to 30º35'21.01"N Longitude77º43'23.70"E to 77º43'29.44"E | Annual Production-25000 MT Total Production-125000 MT |
| 2 | Sh. Deepak Chawla S/o Late Shri Subhash Chand Chawla, 43, Gandhi Road, Dehradun (Uttrakhand) | 802/2/1, 798/1,799/1,1936/796, 1936/796/5, 1627/1, 1747/1, 1624/1, 1743/1/1, 1935/796 (Banour) | 4.66 | 17.08.2030 | Latitude-30º34'36.19"N to 30º35'10.63"N Longitude-77º43'32.86"E to 77º44'30.16" | Annual Production-92000 MT Total Production-460000 MT |
| 3 | M/s Mam Chand Goyal and Sons, 99/3-3, Ganga Vihar, Haridawar Road, Dehradun, (Uttrakhand) | 1746/2,1752/1, 1754, 1755/1, 1759, 1760/2, 1762, 1763/1, 1764/1 (Banour) | 4.99 | 27.02.2030 | Latitude-30º34'29"N to 30º34'30"N Longitude-77º43'25"E to 77º43'26"E | Annual Production-135000 MT Total Production-675000 MT |

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|---|---|---|---|---|---|---|
| 4 | M/s Jai Singh Thakur & Sons, 205/10, Devi Nagar, Tehsil Paonta Sahib, Distt. Sirmour | 1884/131, 1956/1926/1886/131/1 and 2006/145 (Bohar) | 4.09 | 24.04.2035 | Latitude-30º35'22.28"N to30º35'34.97"N Longitude-77º43'09.82"E to 77º43'15.55"E | Annual Production-95000 MT Total Production-475000 MT |
| 5 | M/s Jhakhra Mine & Minerals, C/o Shri Jalam Singh Fauji, VPO Sataun, Tehsil Paonta Sahib, District Sirmour (H.P.) | 1559, 60/18, 25, 26, 27,28, 158081/69, 1582/92, 88, 1583/92, 93, 90, 91, 1615/1461, 1616/1461, 1617/1461, 1618/1461 (Kamrau) | 8.76 | 07.03.2037 | Latitude-30º35'4.40'N to30º36'8.76"N Longitude-77º39'6.21"E to 77º39'21.93"E | Annual Production-First year-75212 MT Second Year-85130 MT Third year-95048 MT Forth year-110295 MT Fifth year-125000MT Total Production-64000MT |
| 6 | Sh. Kush Parmar, Vill. Devinagar, Tehsil Paonta Shaib, Distt. Sirmour H.P., | 537/1 (Kamrau) | 3.08 | 28.08.2031 | Latitude-30º36'38"N to 30º36'43"N Longitude-77º40'41"E to 77º40'52"E | Annual Production-40000 MT Total Production-200000 MT |

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|---|---|---|---|---|---|---|
| 7 | M/s Sohan Singh-Meet Singh, VPO Kamrau, Tehsil Paonta Sahib, District Sirmour, H.P. | 715/2 & 720/1 (Kamrao) | 3.32 | 17.04.2024 | Latitude-30º36'49.88"N to 30º37'01.42"N Longitude-77º40'54.11"E to77º41'00.89"E | Annual Production-First year-105210 MT Second Year-105212 MT Third year to Fifth year-105210MT Total Production-526052 MT |
| 8 | M/s Jai Singh Thakur & Sons, Baldhawa mine, VPO-Sataun, Sub Tehsil Kamrau, Distt. Sirmour, H.P. | 248/1,249/1,251/1, 252/1,253/1,254/1, 255/1, 256/1, 257/1, 258/1, 259/1, 271/1, 491/240/1, 530/516/492/1, 532/516/492/1, 529/516/492, 528/516/492, 527/516/492, 526/516/492, 468/250, 469/250 (Baldhwa) | 12.16 | 28.11.2025 | Latitude-30º35'47"N to 30º35'52" N Longitude-77º40'55"E to77º41'13"E | Annual Production-150000 MT Total Production-750000 MT |
| 9 | M/S Giri Lime and Chemicals, Prop. Sh. Arun Grover, Badripur, Paonta Sahib, Distt. Sirmour(H.P.) | 520/1 (Chowki) | 3.92 | 02.06.2026 | Latitude-30º35'0.913"N to 30º35'7.989"N Longitude-77º37'44.774"E to 77º37''57.475"E | Annual Production-First year-61313 MT Second Year-63563 MT Third year-65531 MT Forth year- |

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|---|---|---|---|---|---|---|
| | | | | | | 67837 MT Fifth year- 70313 MT Total Production- 328557 MT |
| 10 | Sh. Chuhi Ram Sharma, S/o Sh. Jogi Ram Sharma, VPO Kamroo, Tehsil Paonta Sahib, Distt. Sirmour, H.P. | 788/1 (Kamrau) | 3.04 | 06.08.2042 | Latitude-30º36'30.50"N to30º36'36.40"N Longitude-77º40'40.20"E to77º40'50.60"E | Annual Production- First year- 20400 MT Second Year- 15500 MT Third year- 14930 MT Forth year- 9000 MT Fifth year- 8250 MT Total Production- 68080 MT |
| 11 | Shri Rakesh Chaudhary, Vill. Jogiwala, PO Badripur, Dehradun, (UK) | 1926/1886/131/1,148/1 and un-numbered area below Khasra No. 148 (Bila No.) (Banore) | 4.67 | 19.03.2051 | Latitude-30º35'15.63"N to 30º35'25.40"N Longitude-77º43'17.23"E to 77º43'26.29"E | Annual Production- 63160 MT Total Production- 315800MT |
| 12 | Smt. Satya Tomar, 195/4 | 711/1,712/1,715/1,720/1 (Kamrau) | 8.76 | 06.07.2024 | Latitude30º36'43.972"N to 30º36'57.551"N Longitude77º40'39.157"E to | Annual Production- |

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|---|---|---|---|---|---|---|
| | Adarsh Colony, Badripur, Tehsil Paonta Sahib, District Sirmour (H.P.) | | | | 77º54.689"E | 125000 MT Total Production-625000MT |
| 13 | M/s Janki Mines & Minerals, VPO Kamrau, Tehsil Paonta Sahib, District Sirmour, Himachal Pradesh | 528/1, 62 (Shamah Pamta) | 5.53 | 10.09.2052 | Latitude-30º36'48.41"N to 30º37'01.23"N Longitude-77º40'23.75"E to 77º40'36.93"E | Annual Production-First year-15113 MT Second Year-21045 MT Third year-26001 MT Forth year-33821 MT Fifth year-30005 MT Total Production-125985 MT |
| 14 | Smt. Savita Chauhan Shamsehe r Ganj Nahan 1766/7. | | | | Latitude-30º35'30.10"N to 30º35'39.51"N Longitude-77º42'21.36"E to77º42'28.10"E | Annual Production-60000 MT Total Production-300000 MT |
| 15 | Sh. Rajender Singh, S/O | 1356, 1224, 1444/1228, 1443/1228, 1229, | 3.075 | 02.08.2040 | Latitude-30º41'46"N to 33º41'41.3"N Longitude-77º27'36"E to 77º27'43"E | Annual Production- |

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|---|---|---|---|---|---|---|
| | Late Sh. Sunder Singh, Vill Ranfua Jabrog,P. O. Andheri, Tehsil. Renukaji, Distt. Sirmour, H.P. | 1230 (Barwana) | | | | 36000 MT Total Production- 180000 MT |
| 16 | Shri V.K. Walia, S/O Sh. Babu Ram Walia, VPO Dadahu, Tehsil Nahan, Distt. Sirmour (H.P) | 1354/2, 1353 (Bhootmari) | 32.16 | 24.04.2025 | Latitude-30º41'26.24"N to 30º41'42.56"N Longitude-77º27'43.62"E to77º28'18.29"E | Annual Production- 250000 MT Total Production- 1250000 MT |
| 17 | Sh. Supriyank Walia, S/o Late Sh. Virender Kumar Walia Owner Sangrah Limestone Mine, VPO Dadahu, Distt. Sirmour, H.P. | 2433/2363/2163/1979/2 and 14/2 (Sangrah) | 9.04 | 17.05.2028 | Latitude-30º41'12.53"N to 30º41'23.98"N Longitude-77º26'9.2"E to77º26'24.86"E | Annual Production- 81053 MT Total Production- 405265 MT |
| 18 | Sh. Mrigendra Singh, S/o Sh. Maj R.H. Singh, R/o Village Lana Mashoor, Tehsil Renukaji, Distt. Sirmour, | 599/487/2 & 601/488 (Borli) | 7.75 | 19.04.2034 | Longitude77º25'54.54"E to77º26'15.45"E Latitude-30º41'6.69"N to 30º41'16.80"N | Annual Production- 37050 MT Total Production- 185250 MT |

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|---|---|---|---|---|---|---|
| | H.P. | | | | | |
| 19 | M/s Gupta Associates, VPO Dadahu, Teh. Renukaji, Distt. Sirmour, (H.P.) | 1361/2 (Mandoli) | 16.06 | 20.12.2023 | Latitude-30º41'19.01"N to 30º40'54.32"N Longitude-77º26'19.48"E to 77º26'31.71"E | Annual Production-130000 MT Total Production-650000 MT |
| 20 | Hardev Singh Chauhan S/o late Sh. Roop Singh Chauhan, V.P.O Nohradhar, Sub-Tehsil Nohradhar, Distt. Sirmour (H.P.). | 2652/1, 2653, 4613/2654/1, 2655, 2656/1, 2688/2 (Nohradhar) | 8.34 | 18.03.2043 | Latitude 30º48'14.77N to 30º48'14.73N Longtitude 77º26'14.75 E to 77º26'14.97E | Annual Production-First year-30006 MT Second Year-50000 MT Third year-65000 MT Forth year-75000 MT Fifth year-80062 MT Total Production-300068 MT |
| 21 | Sh. Subhash Chand Chawla, 43, Gandhi Road, Dehradun (Bharli Rudana) | 665/2 & 636/2/1, 803/665/2/1 (Bharli Rudana) | 2.84 | 17.05.42 | Latitude 30º33'47.45345"N, 30º33'42.35478"N to 30º33'48.35811N, 30º33'50.81925"N Longitute 77º44'41.18443 E,to 77º44'36.59912E | Non Working (Mining Plan expired) |

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|---|---|---|---|---|---|---|
| 22 | M/s Himachal Mines & Quarries, VPO Bata Mandi, Paonta Sahib, District Sirmour, H.P. | 3082/539/1, 542/1, 542/2, 543/1, 544/1, 3241/553/1, 555/1, 564/1, 3242/568/1, 571/1, 3299/706/1, 707/1, 3301/709/1, 3083/539, 546, 547, 548, 549, 550, 551, 552, 554, 559, 560/1, 560/2, 561, 562/1, 562/2, 563, 565, 566, 567 (Kamroo) | 43.6 | 31.03.30 | Latitude-30º36'48.70"N to 30º36'16.5641"NLongitude-77º039'05.93"E to 77º40'23.83"E | Non Working (Mining Plan expired) |
| 23 | M/s A.Dean & Co., 12 Gandhi Road DehraDun, (Utterakhand) | 956/1, 968/1, 1028/1, 1029/1, 1040/1, 1030/1, 1032/1, 1033/1, 1034/1, 1216/1, 1219/1, 1218/1, 1440/1, 1442/1, 1449/1, 960/1/1, 961, 962, 963, 964, 965, 966, 967, 969, 1030/1, 1887/935, 1031, 1218, 1213, 1214, 1215, 960/1, 960/2, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 825/149, 826/149 (Chittli Pamta) | 4.44 | 19.09.27 | Latitude 30º35'48.25N to 30º35'48.23N Longtitude 77º41'42.03'E to 77º42'12.71E | Non Working (Mining Plan expired) |
| 24 | Sh. Yashwardhan Chauhan, S/o Thakur Guman Singh, Village Chiyog, PO Jamna, Sub- Teh. Kamrau, Distt. Sirmour, H.P | 1271/1 (Chittli Pamta) | 9.26 | 24.06.35 | Latitude 30º35'39.87N, 30º35'35.52 N to 30º35'39.10N, 30º35'39.29N to 77º40'13.66E,77º40"11.62E to 77º40'09.52E | Non Working (Mining Plan expired) |
| 25 | M/S K.N. Cement, Prop. Sh. Naseem Khan, VPO Sataun, Sub Teh. | 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30,31, 32, 33, 34, 34/1, 35, 36/1, 37/1, 38/1, 39/2, 40, 41, 71/1, 72/1, 73/1, 74/1, 75, 75/1/1, 76/1 | 24.18 | 13.03.27 | Latitude-30º36'50.96"N to 30º37'20.93"NLongitude-77º40'58.45"E to 77º41'22.26"E | Non Working (Mining Plan expired) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Kamrau, Distt. Sirmour H.P. | & 4/1, 2144, 2146/1, 2147/1, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165/1, 2166/1, 2167/1, 2168/1, 2169/1, 2170/1, 2171/1, 2172/1, 2151/2173/1, 2174/1, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2369/2755/2182/1 & 2768/2755/2182/2, 715/1, 738/2, 742, 743, 741 & 740 (Chittli Pamta) | | | | |
| 26 | M/S Friends Minerals, Village Pamta, P.O. Dugana, Sub Teh. Kamrau, Distt. Sirmour | 1457/1/2, 1457/2, 1594, 1595, 1881/1572/1, 1881/1572/2 (Chittli Pamta) | 4.84 | 31.07.35 | Latitude-30º35'39.1"N to 30º35'47.8"NLongitude-77º42'9.3"E to 77º42'24.8"E | Non Working (Mining Plan expired) |
| 27 | M/S Barwas Mine Barwas, Vill. Barwas, P.O. Kamrau, Sub Teh. Kamrau, Distt. Sirmour H.P. | 1717/1503/1,1717/1503/2, 1717/1503/3, 1505/753/1, 1505/753/2 and 1716/1503 (Barwas) | 3.34 | 21.04.35 | Latitude-30º35'10.70"N to 30º35'19.96"NLongitude-77º30'27.06"E to 77º30'38.10"E | Non Working (Mining Plan expired) |
| 28 | M/s Ahuja Plastic Ltd., Village Dadahu, Tehsil Renukaji, District Sirmour | 629/1 (Kolba) | 2.01 | 17.04.34 | Latitude30º41'33.56N,30º41'27.69N to 30º41'25.65N to 30º41'25.44N Longtitude77º28'91E to 77º28'43.59E | Non Working (Mining Plan expired) |

DETAIL OF AUCTIONED QUARRIES IN SIRMOUR DISTRICT

| Sr. No. | Name & Address of Lease | Khasra No./ Location (Mauza Mohal) | Area (Bigha/ Hects.) | Period | Approved Quantity Per Annum in MT |
|---|---|---|---|---|---|
| 1. | Shri Dev Raj Negi, S/o Shri Singha Singh, Village Gojjar, Tehsil Paonta Sahib, District Sirmour, H.P. | 35 (Govt. Land Auction Quarry) (Gojjar Adain) | 5-37-05 | 03.06.2019 to 02.06.2029 | Annual Production-95625 MT Total Production-478125 MT |
| 2. | Shri Randeep Singh, S/o Shri Gurbaksh, Village Masruwala, P.O. Dulmana, Tehsil & District Hanumangarh, Rajasthan | 936, 998 Min (Bhagani) | 13-2 Bighas (1-10-40 Hect.) and 635.08 Bighas (53-56-40 Hect.) | 26.09.2023 to 25.09.2038 | Annual Production-797676 MT Total Production-3988380 MT |

## 10 DETAIL OF ROYALTY OR REVENUE RECEIVED IN DISTRICT SIRMOUR

In Sirmour District royalty received from major and minor minerals since 2013-14 onwards is given in the following table.

| Sr No. | Year | Revenue Receipt (in Cr.) |
|---|---|---|
| 1. | 2013-14 | 7.62 |
| 2. | 2014-15 | 8.58 |
| 3. | 2015-16 | 10.72 |
| 4. | 2016-17 | 16.49 |
| 5. | 2017-18 | 14.63 |
| 6. | 2018-19 | 8.49 |
| 7. | 2019-20 | 10.34 |
| 8. | 2020-21 | 8.57 |
| 9. | 2021-22 | 19.54 |
| 10. | 2022-23 | 25.38 |

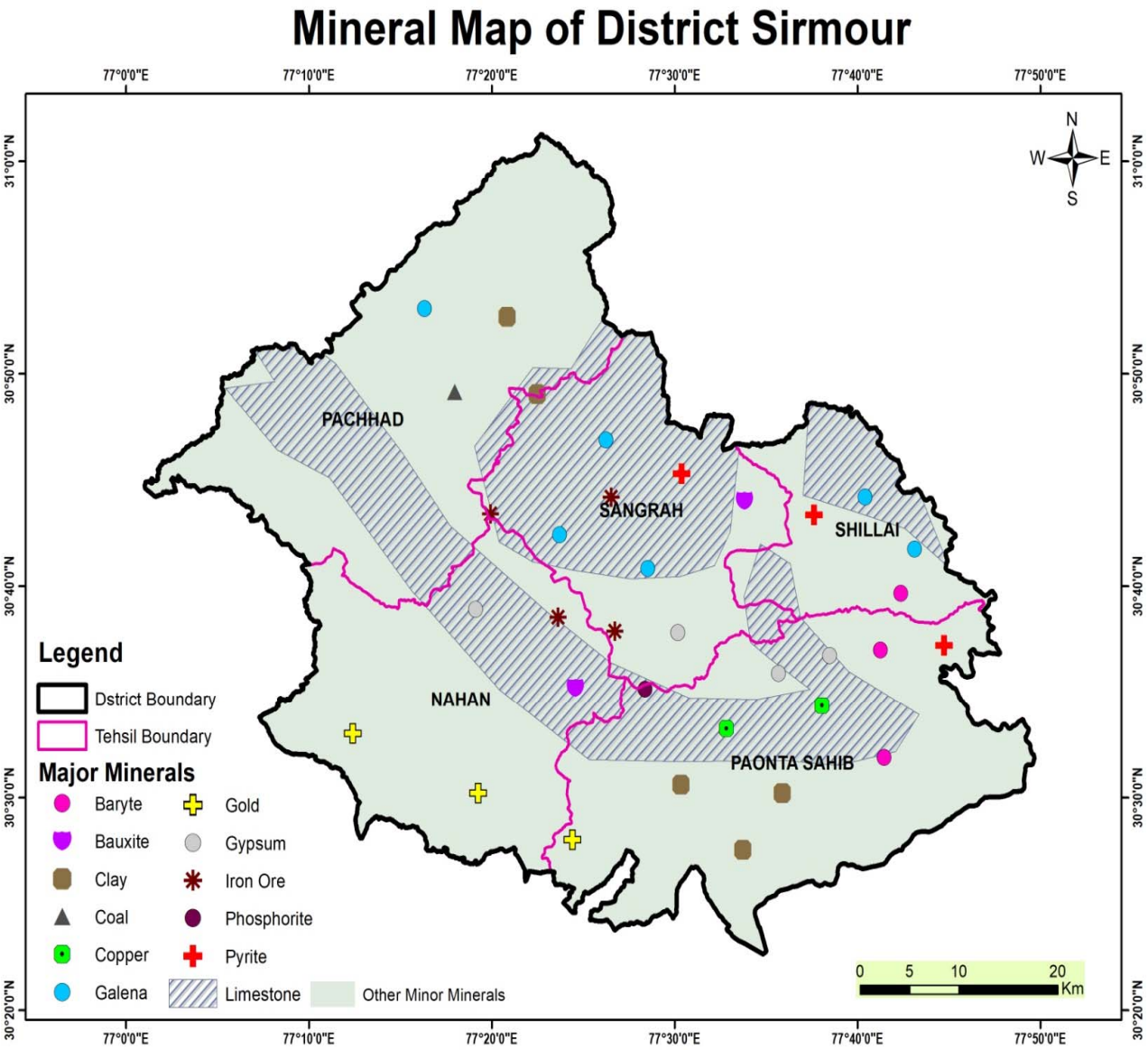
Table : Revenue Receipt in District Sirmour.

## 11 DETAIL OF PRODUCTION OF MINOR MINERALS

The production of minor mineral in district Sirmour since 2013-14 onwards is tabulated in the following table:

| Sr. No. | Year | Production of Minor Mineral (in Tonnes) |
|---|---|---|
| 1. | 2013-14 | 3,93,502 |
| 2. | 2014-15 | 3,36,892 |
| 3. | 2015-16 | 3,73,773 |
| 4. | 2016-17 | 5,66,277 |
| 5. | 2017-18 | 10,57,567 |
| 6. | 2018-19 | 18,57,998 |
| 7. | 2019-20 | 14,99,088 |
| 8. | 2020-21 | 14,34,246 |
| 9. | 2021-22 | 18,71,935 |
| 10. | 2022-23 | 14,96,997 |

## 12 MINERAL MAP OF DISTRICT SIRMOUR



# 13 LIST OF LETTER OF INTENT (LOI) HOLDERS IN DISTRICT SIRMOUR WITH VALIDITY

It is submitted that the department grants mineral concessions by two modes, one through auction and another through mining leases. In both cases, as per the provisions contained in the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015, the areas are inspected by the Joint Inspection Committee under the Chairmanship of SDO (Civil) concerned comprising members from other department like Irrigation & Public health, State Pollution Control Board, Forest Department, HP Public Works Department, Geologist or Mining Officer and as such, the letter of intents are issued only after recommendations of the Joint Inspection Committee which is continuous process.

The applicant has to complete the codal formalities like preparation of mining plan and has to obtain environment clearance before the grant of mineral concession. As such, it is an ongoing process and as soon as the clearances are obtained, the letters of intent are converted into mining lease. Also, if the letter of intent holder is unable to obtain the required statutory clearances within the validity period of letter of intent, the period is accordingly extended so as to enable the letter of intent holder to obtain the required clearances. Hence, as such it shall not be possible to provide the exact details of the letter of intents in this survey document as these keeps on changing on day to day basis.

# 14 TOTAL MINERAL RESERVES AVAILABLE IN DISTRICT

The total limestone reserve of Sirmour district (as per Geological Survey of India) is about 1200 million tonnes. Apart from above, the all the other minor minerals are extracted in the district from the riverbeds as well as hill slopes. The riverbed deposits are always replenishable and the reserves vary depending upon many factors like rainfall, deposition of mineral etc. It is important to mention here that as per the provisions contained in the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015, any area applied for grant of mineral concessions (Riverbed or Hill Slope) are inspected by the Joint Inspection Committee under the Chairmanship of SDO (Civil) concerned comprising members from other department like Irrigation & Public health, State Pollution Control Board, Forest Department, HP Public Works Department, Geologist or Mining Officer as such, the letter of intents are issued only after recommendations of the Joint Inspection Committee.

Further, the mineral potential is site specific and is calculated and year wise planning is done while preparing the mining plan of the area.

# 15 QUALITY /GRADE OF MINERAL AVAILABLE IN THE DISTRICT;

## Limestone

The chemical, cement and dolomitic grade of limestone deposits in different parts of this district. The limestone bearing horizon in Sirmour can be classified in 18 sectors as Naura Area, Sangrah area, Bhootmari area, Pamta area, Baldawa area , Bagan Dhar area , Malani Shilla area Milla area, Tatiyan area , Kamroo area, Chowki Marigwal – Korga area , Banor Bharli area, Bohar Khatwar area, Poka- Bhadrog area, Manal area , Koti Dhaman area, Biala area, Dolomitic magnesia limestone horizon of the Parara area.

The total limestone reserve of Sirmour district are ( as per Geological Survey of India) is about 1200 million tones. The detail of some of the limestone deposit is given below in the following table.

Table showing Reserve and chemical analysis of some of the limestone of District Sirmour

| Limestone deposit | Reserve | Chemical Analysis |
|---|---|---|
| Naura Sub- Tehsil<br>Datwari ( 30$^0$ 46' 45" : 77$^0$ 28'00")<br>Chunvi ( 30$^0$ 46'30" : 77$^0$ 24'10") | Potential 101.36 million tonnes, Inferred 21.44 million tonnes | CaO 53.93 %, MgO 0.61 % |
| Naura Sub- Tehsil<br>Hathna( 30$^0$ 48' 00" : 77$^0$ 25'15")<br>Olana ( 37$^0$ 48'00" : 77$^0$ 26'00") | Probable 29.87 million tonnes | CaO 53.90 %, MgO 0.66 %, $Al_2O_3$ 0.22% and $Fe_2O_3$ 0.19% |
| Naura Sub- Tehsil<br>Dida-( 30$^0$ 46' 45" : 77$^0$ 25'20")<br>Bhanra ( 30$^0$ 46'15" : 77$^0$ 26'00")<br>Shangoli ( 30$^0$ 46' 40" : 77$^0$ 26'45") | Reserve upto 100 metres = 34.56 million tonnes | CaO 53.22 %, MgO 14.1 %, |
| Naura Sub- Tehsil<br>Naura -( 30$^0$ 47' 10" : 77$^0$ 24'10")<br>Hindga ( 30$^0$ 48'40" : 77$^0$ 23'30") | Reserve upto 60 metres = 6.26 million tonnes | CaO 53.95 %, MgO 0.88 %, |
| Naura Sub- Tehsil<br>Bulain Dhar -( 30$^0$ 47' 10" : 77$^0$ 24'10") | Reserve upto 60 metres = 1.94 million tonnes | CaO 53.60 %, MgO 0.95 %, |
| Bhatrog ( 30$^0$ 32' 45" : 77$^0$ 38'53")<br>Baila ( 30$^0$ 34' 42" : 77$^0$ 28'19")<br>Section | 48.84 million tonnes | CaO 50 %, MgO 1 %, |
| Sataun-Kamroo- Banor – Bharli – Pamta- Shilla – Sangrah sector | Reserve upto 30 metres = 446 million tonnes | CaO 55 %, |

The limestone bearing belts of the Sirmour District are shown in the following figure.

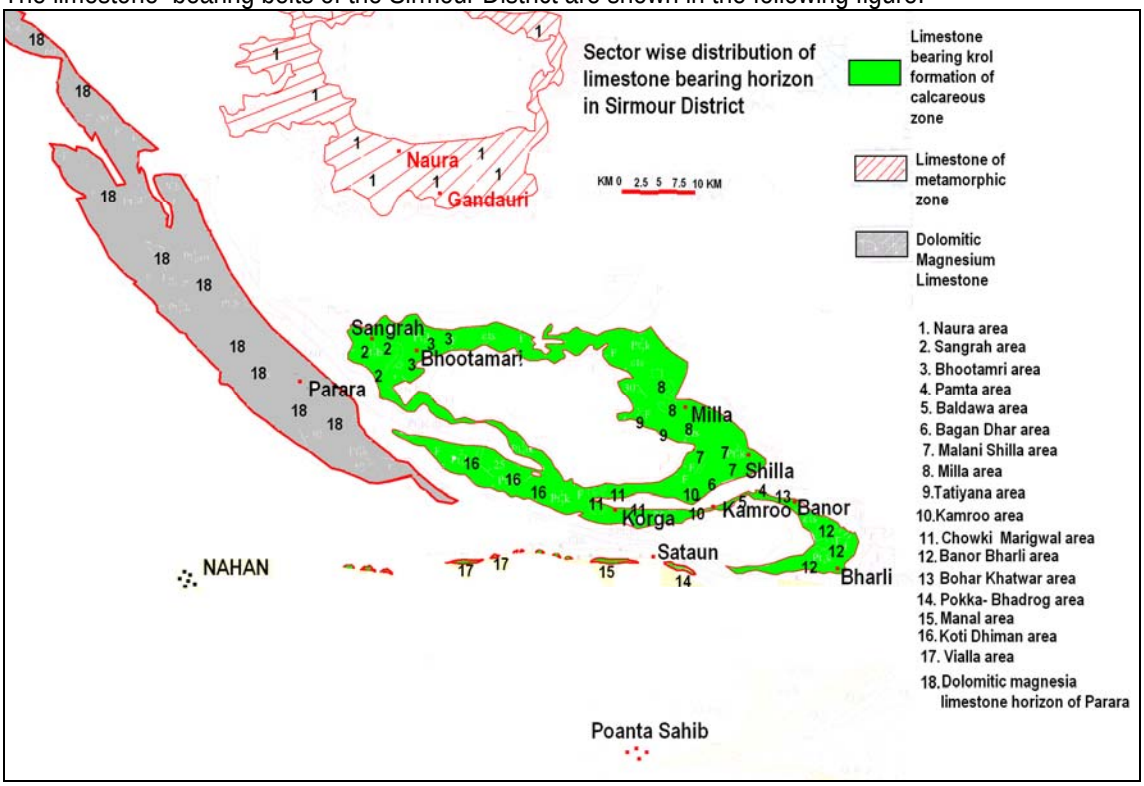



Figure: Limestone bearing belts of the Sirmour District

<u>Baryte</u>

The barytes deposits in Sirmour district is usually associated with Krol limestone and appear to have formed by the process of replacement. The mineral occur in either pure form of admixed with dolomite of the Krol Formation. In the Jogar- ka- Khala however it is associated with Balaini Boulder beds

i) Kanti ( $30^0$ 37' N – $77^0$38' E)

The deposit is situated about 1 km SSE of Kanti on the northern slope of the hill. The mineral occurs associated with Krol limestone in the form of a vein which has an average width of 7 metres and is traceable for about 50 metres. Further to east three or four other small outcrops of barytes are met with the same strike but these are comparatively small and the mineral is also greatly admixed with dolomite. In some cases the specks of galena mineral were also found associated with barytes .The deposit was first prospected by the Sirmour Mineral Development Co. when five or six trenches were put in the main vein across the deposit.

The mineral is white in colour and fine grained in texture. For the greater part of the deposit it is pure but near margin it is admixed with some dolomite. The material form the outcrop to further east of the main vein is poor being mixed with country rock. The average chemical analysis of the deposit is as given in the following table.

Table Showing chemical analysis of the Kanti Baryte

| | %age |
|---|---|
| $SiO_2$ | 0.08 |
| $R_2O_3$ | 0.30 |
| MgO | 0.15 |
| CaO | trace |
| $SO_3$ | 33.81 |
| BaO | 64.64 |
| Loss | 0.39 |

The total reserve upto the depth of 7 metres was calculated as 15000 tonnes. The mining lease for the extraction of Barytes from this deposit was granted to M/S Ram Narayan & Bros, in the early sixties and was abandoned after full recovery of the deposit.

ii ) Tatyana ( $30^0$ 38' 30"N – $77^0$38' E)

The deposit is situated about one km south east of Tatiyana Village on the northern slope of limestone hillock near a spring. This occurrence is similar to nature to that at Kanti with the difference that here the mineral is very much admixed with dolomite. The zone of barite covers over an area of 350 X 120 metre on the slope of the hill. This area was also first investigated by the Sirmour Mineral Development Co. On the whole the mineral is impure and mixed with dolomite. There are few pockets of baryte also but the quantity in these is very limited. The chemical analysis is as given below in the following table.

Table Showing chemical analysis of the Tatyana Baryte

| | %age | | |
|---|---|---|---|
| $SiO_2$ | 0.38 | 0.20 | 0.6 |
| $R_2O_3$ | 0.59 | 0.34 | 0.50 |
| MgO | 12.45 | 14.44 | 4.16 |

| | | | |
|---|---|---|---|
| CaO | 18.07 | 20.90 | 6.31 |
| $SO_3$ | 14.29 | 11.10 | 27.49 |
| BaO | 25.97 | 20.79 | 51.51 |
| Loss | 27.31 | 31.64 | 9.36 |

The baryte is also reported near Rajpur (( $30^0$ 33'N – $77^0$44 E) & Jagar -Ka -Khala ( $30^0$ 37' 30"N – $77^0$28' E). The mineral baryte is mined in District Sirmour and the only underground mine in private sector is in Himachal Pradesh.

Bauxite

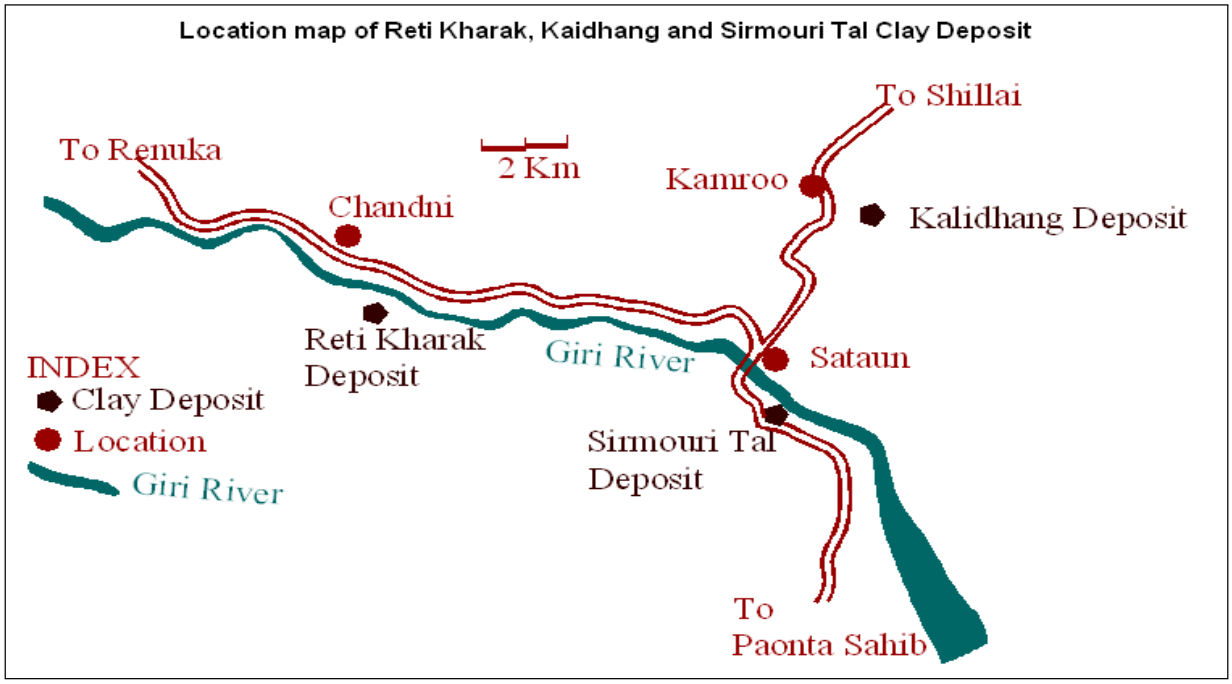
In Bench area (30°47' : 77°37') in Sirmaur district, bauxite occurs in isolated patches at the base of Eocene/Palaeocenc rocks i.e. Kakra and Subathu Formations. The deposit contains low alumina and high silica. Bauxite at Nahan (30° 33' :77°16'). Its outcrop is buried under a landslide.

Clays

Clay occurrences in Himachal Pradesh can be broadly classified into (i) lacustrine and fluvial, (ii) residual associated with granite and (iii) associated with the Middle and Upper Siwaliks.

Brick -clay of fluvial origin occurs at and around Sirmur Tal ($30^0$ 32' 30": $77^0$ 39' 20"), 16 kms north of Paonta Sahib. Similar clay also occurs along the Nimba -ka - Khala, The occurrence extends for 500 metres with an average width of 80m. The average thickness is 3.38m with 1.2m thick overburden. Other occurrences of this type of day are at Rati Kharak ($30^0$ 31' 00": $77^0$32' 10") and Kalidhang ($30^0$ 36'30": $77^0$ 39' 30"). At Rati Kharak the clay occurs in an area, 480m in length and 120m in width. The thickness of the clay is two metres. In Kalidhang area, the clay occurs on both sides of Khasuda Ka Khala. The deposit is 540m in length and 180m in width. Its thickness varies from 20m to 30m. The deposit contains clay bands of varying colours. The clay bands are inter layered with bands of gravel, pebbles and sandy loamy soil. The varved nature of the clay deposit indicates that the clay is of lacustrine origin. The reserves of the clay around Kalindhang are about 2.93 million tonnes upto a depth of 20m.

Probably, frequent floods in the river Giri have resulted in depositing the banded colluvial clay in Sirmur-Tal and Reti-Kharak at its southern bank providing a promising cultivable land for the area. Physical studies reflect that Nahan and Mandhali Formations through which the river Giri flows are the main provenance. The black and light varved clay deposit near Kalidhang is of lacustrine type. The tectonic movements in relatively recent past perhaps resulted in change of geomorphic features forming a temporary small lake in which the deposition of this clay took place.




A few clay pockets occurring within the weathered rocks of Chor Granite Complex have been reported at Kanda ($30_0$50'30": $77^0$24' 15"), Roundi ($30^0$49'30"; 77° 27'00"), Kotiyan (30° 49'08"; 77° 27'15") and Gudag, ($30^0$46' 30" : 77° 29' 15"). The clay is dirty white to white in colour. It is sticky when wet and powdery when dry. The length, width and thickness of the pockets varies from three metres to 22m, 0.5 to two metres and 0.5 to five metres respectively. An occurrence of China clay is known from one kilometre north of Rajpur (30° 35': 77° 44').

## Coal

In Sirmour District at Deothal (31° 51': 77° 10') in the tributary of Kewal Khala there is occurrence of coal in the Subathu Formation, but due to folding in the rock it has been greatly crushed and it occurs in soft powder form.

## Copper

In Sirmour District at Sataun ($30^0$ 33' ; $77^0$ 38'), copper mineralization occurs in the carbonaceous shales and quartzites of the Blaini Formation. The mineralisation zone is 25m wide along a road section and consist of stringers and disseminations of pyrite and chalcopyrite. Copper values range from 0.13% to 4.40%. One zone has analysed and showed 2.27% Cu along 1.30 (m true) width.

## Galena

In Sirmour District Massive lode of a minor deposit comprising galena and sphalerite has been reported at Anyar (30° 44': 77° 44'). The samples from old W have been analysis indicating lead 0.75% and zinc 0.21 % Another sample gave 10% zinc/content.

Three old W (adits) exist at Anyar in the Infra Krol phyllites, slates and limestonnes. The middle shows mineralisation and is 2.80 m long extending in N $60^0$ W direction after which it becomes narrow and is caved. This adit is located in yellowish–brown friable phyllite trending N 70 $^0$ W- S$70^0$E and dipping $65^0$ to NE. The ore body consisit of massive load comprising pyrite, minor specks of galena and sphalerite. The load is 0.70 m thick and strikes in N$50^0$ W –S$50^0$E directory and dips $35^0$ to $65^0$ to the NE. The load appears to be localized along the anticline trending N$70^0$W- S$70^0$E. Another small

lode about 0.30 m thick occurs to the hangwall side. The northern old mine occurs at the contact of phyllite and grey limestone. This adit is 3.70 m long and inclined at an angle of $30^0$ in a $N50^0E$ direction.

(ii) Synsedimentary, polymetallic sulphide mineralisation occurs within an interbedded slate-limestonne sequence near the Deoban-Shimla Group contact in Dathyari- (30° 41' : 77° 45') - Chamri (30° 43': 77° 44')- Auri ($30^0$42' : 77° 44' ) area. Three mineralised lodes 20cm to 150cm thick ranging in length from 75m to 80m have been delineated over a strike length of nearly 340 metres. One sulphide zone trending $N70^0W$-$S70^0E$ occurs along a shear zone in slates. Another sulphide vein runs sub- parallel to this zone and strikes in $N60^0W$-$S60^0E$ direction. The sulphide mineralisation mostly comprises marcasite with galena, sphalerite, pyrite and chalcopyrite. The mineralized zone analysis shows 3.09% Pb, 3.01 Zn over a true width of 1.25 m. This value hold good for a length of 10 meter. Two old W existing in Chamri area.

(iii) Small lenses and veins of quartz with galena are observed in slate and phyllite exposed in the Amba area ($30^0$ 38 : $77^0$27' ). Large pebbles with rich galena mineralisation are a common sight all along the Amba *Nala.* Small gossanised band measuring 4m x 1m occurs in sandstonne and shale of subathu Formation, one ilometre east of Chapla (30° 58' : $77^0$ 27') in Dabur God. Lead value varies from 0.9 to 0.38%. Old Ws of lead ore have been reported at Danheri ($31^0$00': $77^0$00') and Panuh (30° 50' : $77^0$08').

## Garnet

Garnet occurs in abundance in the mica schists so conspicuously developed all along the base of Chor mountain in Sirmour District. It is commonly seen on the top hills comprising mica schist and in the beds of nalas that flow through the mica schist. For the most part garnet is small in size but in a few places e.g. Kehdi ka Dhar it attain the size of 4 cm in diameter. The garnets met within the nallas are usually rounded through rolling action.

## Gold

Placer gold has been reported from the Siwaliks and is reported in different part of the district. The Geological Survey of India had done detailed investigation in the Ujjal Ki Nadi, Gumti Nala, Trilokpur Nadi, Khiari Ka Khala, Bharion Khala, Matar ka Khala, Jamni Nala , Somb River , Salauni ki Nadi etc. The investigation shows that all these river sediments are auriferous.

## Gypsum

In Sirmour District, Gypsum occurs at several places in massive form in the Krol Limestone and as selenite crystals associated with the carbonaceous shales in the Nahan Sandstonne. The deposits of the former type are comparatively large whereas those of the latter are usually very small. A brief account of the gypsum deposit in District Sirmour are as given below:

### Korga ( $30^0$ 37' 30" : $77^0$28'0"

Gypsum occurs in steep and precipitous escarpments about 3 km southwest of Korga the Niri –Ka-Khala almost at right angle and dipping steeply toward southeast. Gypsum is associated with red shale, bleached shale, limestonne and dolomite of Krols and occurs in the form of lenses, pockets and thin bends. For the greater part of the deposit the mineral is admixed with dolomite and shale but occasionally pockets of pure gypsum are also present. Sometimes crystalline dolomite is also associated with the gypsum. At places specks of native sulphur are also seen. The Gypsum is usually white, grey or reddish, the former two varieties being mostly associated with dolomite and the letter with red shale of Krols.

The mineral occurs in three vains

1. The northern vein
2. The central vein
3. The southern vein

The northern vein extends east – west continuously for a distance of about 300 metres with an average width of 50 metres to West, after a gap of 600 metres it again traceable near Purla for a distance of about 120 metres with an average width of 27 metres. The northern part of the vein is associated with red shales and the southern part with dolomite and shales. For the greater part of the deposit the gypsum is admixed with dolomite and shale but at few places as in southern part , in western gorge of the Niri- Ka -Khala , the concentration of the gypsum is more and the samples analysed from this region shows 60 to 80% gypsum in the rock while in other areas the gypsum contents are less than 60%.

The central vein extends for a distance of about 380 metres with an average width of about 35 metres. In the eastern gorge of the Niri- Ka -Khala it is about 60 metres. A large part of the vein on both sides of the Niri –Ka- Khala has been eroded away and the rock in situ are covered with debris. Gypsum occurs in thin bands, pockets and lenses. There are small pockets of pure gypsum but these are seldom more than one metres in dimension.

The southern vein extends for a distance of nearly 400 metres with an average width of about 30 metres. Further to west after a break of about 200 metres it is again picked up and can be traced for another 80 metres. The nature of occurrence of mineral is similar to that of central vein. The mineral is comperatively more concentrated in the easternmost part of the vein where the gypsum content is about 70% while in other parts of the vein it is only 35 to 40 %.

As per estimate the reserve of the deposit containing above 60% of Gypsum and which can be sorted upto 80% by hand picking is about 90000 tonne and material containing below 60% of Gypsum is about 900000 tonne, but this is too much contaminated with dolomite and shale and can not be sorted.

Bharli ( $30^0$ 33' : $77^0$45')

Gypsum occurs as an escarpment about 1 km NNW of Bharli village on the Paonta-Bharli-Banor Road.The mineral occurs as pockets, lenses and bands associated and greatly admixed with the dolomites and shales of the Krol Formation. The zone bearing gypsum extends NNE-SSW for a distance of about 400metres with average thickness of about 50 metress.In the greater part of the deposit the rock mineral is admixed with dolomite and shale. The deposit is of inferior quality and may contain about 281, 250 tonne of gypsum

Shilorna ( $30^0$ 36' : $77^0$37')

Small deposit of inferior quality of Gypsum occurs about 1.5 Km southwest of Silorna. The quality of deposit is poor and deposit is not of much economic importance

Kulthiana ( $30^0$ 33' : $77^0$42')

There are small patchs of gypsiferous rocks in the Krol Limestonne near Kulthian. The rocks are too much admixed with dolomite and the deposit is very small in nature.

Ridana ( $30^0$ 34' : $77^0$45')

Gypsum in this are is exposed at three places one in the Puruwala Khala and other two in the stream draining the eastern gorge of the Puruwala Khala. At all the places the gypsum is lenticular and admixed with shale and dolomite.

Bhaunrari (30$^0$ 34' : 77$^0$ 14')

In this area small pocket of poor quality gypsum is also reported.

Nahan (30$^0$ 33': 77$^0$ 18')

Small crystals of selenite occurs associated with the carbonaceous rocks, about 3 km northeast of Nahan on the Nahan- Sarahan road is also reported. The deposit is very small and is of inferior quality.

Iron Ore

In Sirmour District Magnetite occurs as lenticles in quartzite of Jutogh Group at Lana Cheta ( 30$^0$ 47': 77$^0$ 22' ) - Kanhari (30$^0$47': 77$^0$ 21') area ,known as Lana Cheta Iron ore.

Lana Cheta Iron ore deposit

Lana Cheta area is situated on the borderline of the Renuka and Rajgarh Sub-division of District Sirmour.The area is situated at an altitude of about 1300 meter above mean sea level, along the either bank of Nait Khala, with two parallel ridges on either side. The Nait Khala flows in South Western direction and cuts across the strike of the Formation. It is a perennial stream. It is fed by seasonal transverse tributaries which run mostly parallel to the strike formations. The valley is comparatively broad, especially in quartzite zone, which is quite unusual in the Lesser Himalayan topography.

The Iron ore deposit of Lana Cheta had been known since long and were possibly worked by the local blacksmiths for the manufacture of their tool etc. The erstwhile Raja of Sirmour Estate, during 19$^{th}$ century, made certain experiments on this ore for use in Nahan Foundary but due to heavy cost of transportation and poorness of ore, it was abandoned.

The iron ore occurrences south and south-east of Kanhari village are popularly known as Lana-Cheheta iron ore deposits. They are exposed along the banks of Nait Khala. The mineralization is restricted at the base quartzites of Jutog Group. No mineralization is seen in the carbonaceous slate& and schist.

Lower horizon:- The lower horizon is only a few metres away from the contact of the quartzites and carbonaceous horizon and has better concentration and worked in the past.. There are two main localities namely Kanhari old Ws and Fumaria old Ws. Kanhari old Ws are situated along the northern scarp of the Nait Khala, about 800 metres south of Kanhari village. There are two old Ws; one being just along the foot-path and the other is about 20 metres SW of the first one. The mineralization is restricted to the old Ws only and there is hardly any lateral

Extension. There are again two old Ws along the Fumaria ridge. The main o ld W is about 300 metres SE the Kanhari old Ws and is situated on the steep slopes of the ridge. There is a vertical face at a distance of about 25 metres south-east of the old W with magnetite lenses and quartz veins in the hard massive grey and white quartzites. The inbetween portion of old W and the vertical face is covered with debris wihte few boulders of magnetite. There are thin veins and streaks of magnetite in between and on the sides of these lenses. The magnetite lenses are about 2 to 4 metres in thickness and extend upto 60 to 10 metres. Two metres SE of the middle lens there is another lens of magnetite which is about 15 metres in length and is about l.5 metre thick in the middle. After a covered portion of about 7 metres, there is another lanticular outcrop of magnetite which is 2 metres in length and 0.5 metre width. There are numerous quartz veins and some of them being 30 to 50 cms thick running parallel as well as oblique to the ore body. Silica in the form of thin streaks of lenses and specks is quite commonly seen. Pyrite also occurs in great abundance in the form of pockets and veins within the magnetite lenses. The second old W along the Fumaria ridge is situated at a distance of about 600 metres SE of the main old Ws.

Upper horizon:- The uprer horizon is exposed 640 metres in north eastern direction from the lower horizon and has greater extensions but poor concentrations. Starting from almost top of the ridge south of Kanhari village, it is exposed along the either banks of Mait Khala passes through the Reoli ridge and, with a few exposures in the fields NE of Chandrona village, is again exposed along the Southern slopes of Chandrona ridge and gradually pinch out in SE direction.

Khanhari or right bank block:- The mineralized band, start from almost top of the ridge, south of Kanhari village, is traceable in north eastern direction up to fifty metres short of Mait Ka Khala. The mineralized zone is about 2 to 4 metres tr.ick. In most of the portions there are thin streaks of magnetite running along the bedding planes. In the north-eastern portions of the mineralized band there is a better concentration of magnetite which can be traced for about 350 metres. Thin lenses with streaks of magnetite can be further traced in South West direction for about 250 metres. The maximum of magnetite veins recorded is about 60 to 70 cms only Pyrite is seen at one place exposed along the foot-path east of Kanhari village. It occurs as thin stringers and pockets in the magnetite body. Silica veins are also associated along with the ore body. With no extensions of mineralization on the bank of the ridge and its sudden disappearance in the Kanhari nala indicates limited extensions along the strike direction in this block.

Left bank block:- An almost continuous, conspicuous and projected band of quartzite with magnetite mineralization is exposed along the left bark of Nait Khala starting from the confluence point of Rampur nala with that of Nait Khala, it runs in Southern direction for about a distance of 100 metres with an average thickness of 2 to 3 metres.. Thereafter, it suddenly disappears for a distance of about 120 metres under debris and is again seen continuously along south eastern direction to form part of the Reoli Block.

The nature of mineralization is similar as in the right bank block. Pyrite in the form of thin stringers was seen at one place of the sections. The mineralized zone is about 3 to 4 metres thick. The concentration seems to increase along the dip direction.

Reoli Block - The mineralized band exposed along the Reoli ridge a little south of Reoli village runs almost in the strike direction for a distance of 300 metres with a few intermittent unexposed portions covered by debris and continues upto the right banks of Pipli Nala. It dies out at the confluence of Pipli and Chandrona Nala. The mineralized zone gradually disappears in the south eastern direction. The maximum concentration is near village Reoli where it is about 2 to 3 metres thick. Silica again form a common association with almost absence of Pyrite.

Chandrona Block: The mineralized band is exposed along the the south western and southern slopes of chandrona ridge. It is exposed along the foot path going to village Bhotli for a distance of about 25 metres. Further in south east direction it is exposed for about 200 metres - a little below the foot path . It completely dies out near Tali School. The maximum concentration is along the outcrop exposed along the foot path and it gradually goes on decreasing in the South East direction.

Pyrite

An occurrence of pyrite in the form of lenses and veins in limestonne and slate was recorded at Sayasu (30° 4': 77° 4'/) and Diyandon (30° 43': 77° 43'). The steeply dipping vein at Sayasu is exposed in the bed of the Tons river, for a distance of 150 metres with a thickness varying between 50 cms and 1.2 metres. On analysis the sample yielded 30% sulphur with arsenic in traces.

Talc/ Steatite

In Sirmour District Steatite of good quality occurs at Nahan ($30^0 33'$:$77^0 17'$).

Zinc

In Sirmour District Zinc is found associated with galena and pyrite at Anyar ($30^0$ 44' : $77^0$ 45') and Chamri ($30^0$43' :$77^0$45'). At Anyar, the samples from old W analysed 1.5% Zn and 0.21 %Pb. Another sample gave 10% Zn. At Chamri the zone contains 3.01% Zn and 3.01 % Pb.

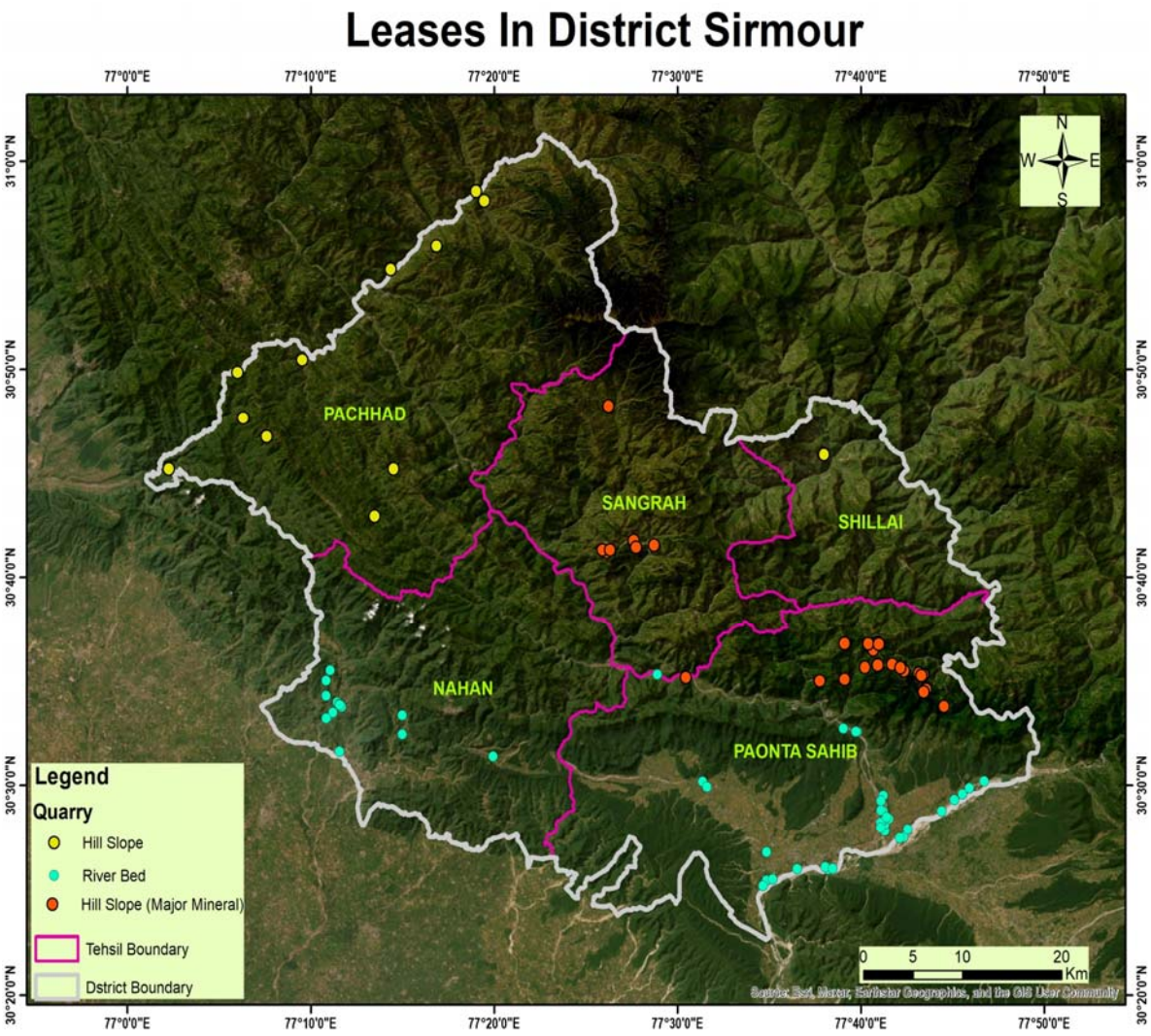
## 16 USE OF MINERAL

Limestone, dolomitic- limestone, shale, brick earth, minor minerals like sand, stone & bajri. The mining activities in district can basically be categorized under large sector and in small sector. The large sector comprises of major limestone projects for cement manufacture and the small mining sector comprises mining of minor minerals like sand, stone, bajri, slates, shale, clay etc. which are basically building material required to meet the infra-structural development of the district. The Cement plant of M/s CCI Ltd. is located at Rajban in Sirmour district of Himachal Pradesh, on the National Highway NH 707 installed with a capacity of 0.35 MTPA, it has modernized and expanded to a total capacity of 4.64 million-tonnes of cement per annum.

## 17 DEMAND AND SUPPLY OF THE MINERAL IN THE LAST THREE YEARS;

The demand is huge as constructions activity grows with faster growth of country as well as state. Cement manufacturer make cement as per market demand of both local and out of district and the minor minerals are basically building material required to meet the infra-structural development of the district.

## 18 MINING LEASES MARKED ON THE MAP OF THE DISTRICT:




## 19 DETAILS OF THE AREA OF WHERE THERE IS A CLUSTER OF MINING LEASES VIZ. NUMBER OF MINING LEASES, LOCATION (LATITUDE AND LONGITUDE):

The details of all the mining leases granted in the district alongwith the Geo-Cordinates is already provided at (9) 9.1, 9.2 & 9.3 and have also been marked on the distrcit map at (18).

## 20 DETAILS OF ECO-SENSITIVE AREA, IF ANY, IN THE DISTRICT:

Two Nos.:-

1. Eco-Sensitive Zone of RenukaJi Wildlife Sanctury.
2. Eco-Sensitive Zone of Simbalwara National Park.

## 21 IMPACT ON THE ENVIRONMENT (AIR, WATER, NOISE, SOIL, FLORA & FAUNA, LAND USE, AGRICULTURE, FOREST ETC.) DUE TO MINING ACTIVITY;

Generally, the environment impact can be categorized as either primary or secondary. Primary impacts are those which are attributing directly by the project. Secondary impacts are those which are indirectly include the associate investment and change pattern of social and economic activities by the proposed action.

The impact has been ascertained for the project assuming that the pollution due to mining activity has been completely spelled out under the base line environmental status for entire ROM which is proposed to be exploited from the mines.

The major air pollutants due to mining activity include

AIR ENVIRONMENT

Dust is emitted to air mainly due to vehicular movement on the un-metal led road and such pollution is seen mainly during summer and winter seasons.

As far as air pollution is concerned, fugitive dust (SPM) pollution will be predominant over the others such as NOx, SO2 etc. Mining unit operation such as excavation, loading & unloading, movement of truck/tippers on the kuchha roads, no doubt, will generate the fugitive dusts.

WATER ENVIRONMENT

Some time the mining activity leads to the water table causing ground water depletion. Due to the interference with surface water sources like river.

Strata water gets disturbed and contaminated in case of intersection of ground water table.
Natural water table of the area gets disturbed.

Contamination of surface water bodies due to the discharge of mine water and surface runoff workshop effluent.

NOISE LEVELS

The source of noise will be due to the deployment of machines in the lease area.

Operation of drilling machines, blasting, excavation, loading & unloading of mineral etc. such high level of noise can cause health effects, poor work performance and disturbances to human and wild life and constant source of disturbance.

LAND ENVIRONMENT

The topography of the area will change certain changes due to mining activity which may cause some alteration to the entire eco system. Mining causes various land disturbances/degradation due to change in land use pattern.
Removal of forest covers which causes loss to flora and fauna and take many years to get back similar forest cover if the mining area is properly reclaimed. Removal of top soil and overburden causes loss on agriculture.

IMPACT ON FLORA & FAUNA

The impact on biodiversity is difficult to quantify because of its diverse and dynamic characteristics. Mining activity generally result in the deforestation ,land degradation, water, air & noise pollution which

directly or indirectly affect the faunal and flora status of the project area. However, occurrence and magnitude of these impact are entirely dependent upon the project location, mode of operation and technology involved.

## 22 REMEDIAL MEASURES TO MITIGATE THE IMPACT OF MINING ON THE ENVIRONMENT;

MITIGATION MEASURES

The following mitigation measures are being/ will be adopted to mitigate air pollution generated due to the mining activities:

- During Drilling Operation
  Dust generation is reduced by using sharp teeth of shovels.
  Providing dust extractors to drilling units.
  Personal protective equipment's is being provided to drill operators and his helpers.

- During Blasting Operation
  Proper stemming in blast holes.
  Avoiding blasting during unfavourable condition.
  Use of Rock Breaker to avoid blasting in ridges.

- During loading operation
  Latest generation loading equipment's like hydraulic excavators is being/ will be used and operated by skilled operators to load dumpers.
  Water tanker arranged for water sprinkling on haul roads and Loading Point.
  Propagation of this dust is/ will be confined to loading point only and does not affect any person nearby. Both the operators of excavator and dumpers present at that point operate the machine from a closed cabin.

- During Crushing
  Crusher hoppers & conveyor systems to be totally enclosed and provided with water sprayers.
  Completely covered stacker and reclaimed shed are provided at crusher.
  Water sprinkling system has been installed at crusher.

- During Transport operation
  Water tanker has been in operation for regular water sprinkling on haul roads for dust suppression.
  To control the gaseous emission, all mine machineries are maintained in proper order/as per OEM through routine checklist.
  Strict speed limit (20-25 km/hr) of vehicles is /will be implemented.
  Proper covering of transported material and stored raw material.
  Regular maintenance of HEMMs & transportation vehicles.
  Measures will be taken to reduce the diesel consumption during transportation.

- Plantation work
  Local forest trees (Acacia catechu, Acacia nilotica, Acacia Senegal, Aegle marmelos, Albizia amara, Albizia lebbeck, Albizia odoratissima, Albizia procera,

Alstonia scholaris, Anogeissus latifolia, Azadirachta indica, etc..) has been used for plantation/greenbelt.

- Safety Measures for Water Reservoir at Conceptual Stage
  Construction of wire fencing along the periphery of the reservoir.
  Plantation will be done between the mining pits and the periphery of lease.
  Conduct geo-technical stability studies involving expert agencies.
  Management of Waste Water generated at mine site
  No waste water is being/ will be discharged outside lease boundary.
  Domestic waste water generated is being/ will be disposed off in Soak pit.
  Workshop waste water is treated and reuse for washing purpose by installing

  gravity separation method to separate water & oil.

NOISE & VIBRATION AND MITIGATION MEASURES

- The following control measures is being/ will be adopted to keep the ambient noise levels within the limits:-

  When conventional drilling, use of sharp drill bits to achieve optimum drilling performance and to reduce noise generation at source.
  Avoiding the secondary blasting.
  Adoption of control blasting with proper spacing, burden and stemming.
  Blasting is to be carried out during favorable atmospheric conditions and low human activity timing.
  Use of proper designed machinery, maintained properly.
  Crusher is totally enclosed in a covered building to minimize sound propagation.
  Sound insulated chambers for the workers deployed on the machineries producing higher level of noise like dozers, drills etc.
  Regular maintenance, oiling and greasing of machines at regular intervals is being/ will be done to reduce generation of noise.
  All employees and operators has been/ will be provided with protective equipment, earmuffs and earplugs as a protective measure from the high noise level generated near the machinery.
  Noise Monitoring is carried out in core zone and buffer zone by NABL accredited laboratory.

## *23* RECLAMATION OF MINED OUT AREA (BEST PRACTICE ALREADY IMPLEMENTED IN THE DISTRICT, REQUIREMENT AS PER RULES AND REGULATION, PROPOSED RECLAMATION PLAN);

As per status all mines are to be closed before final closure of mine.
Reclamation of exhausted mines are planned to be undertaken in below three possible manner

1-if, sustainable amount of waste is there, the exhausted quarry can be fully or partly backfilled using the store waste. the backfilled area to be brought under plantation of local species.
2-if the generation of waste is much less and depth is less then plantation on broken up surface.
3-convert to water reservoir after stabilization of slope if the exhausted quarry continue much below the surrounding surface level. it is preferred to cordon the water reservoir either throw wire fencing or retaining wall with plantation from the safety point of view.

Most of the mine lease area are yet to be exhausted from ore point of view. Hence ,reclamations would be taken up only after exhaustion of the ore/mineral from the area.

# 24 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

## Risk Assessment

The complete mining operation is being/ will be carried out under the management control and direction of a qualified mine manager holding a First Class Manager's Certificate of competency to manage a metalliferous mine granted by the DGMS, Dhanbad. The DGMS have been regularly issuing standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff is being/ will be sent to refresher courses from time to time to keep them alert. However, following natural/industrial hazards may occur during normal operation.

### Natural Hazards

- Landslides;
- Flash floods;
- Damage of life and property;
- Disruption of road & telecommunication facilities; and
- Lightening

### Industrial Hazards

- Accident due to explosives;
- Accident due to heavy mining equipment; and
- Sabotage in case of magazine.

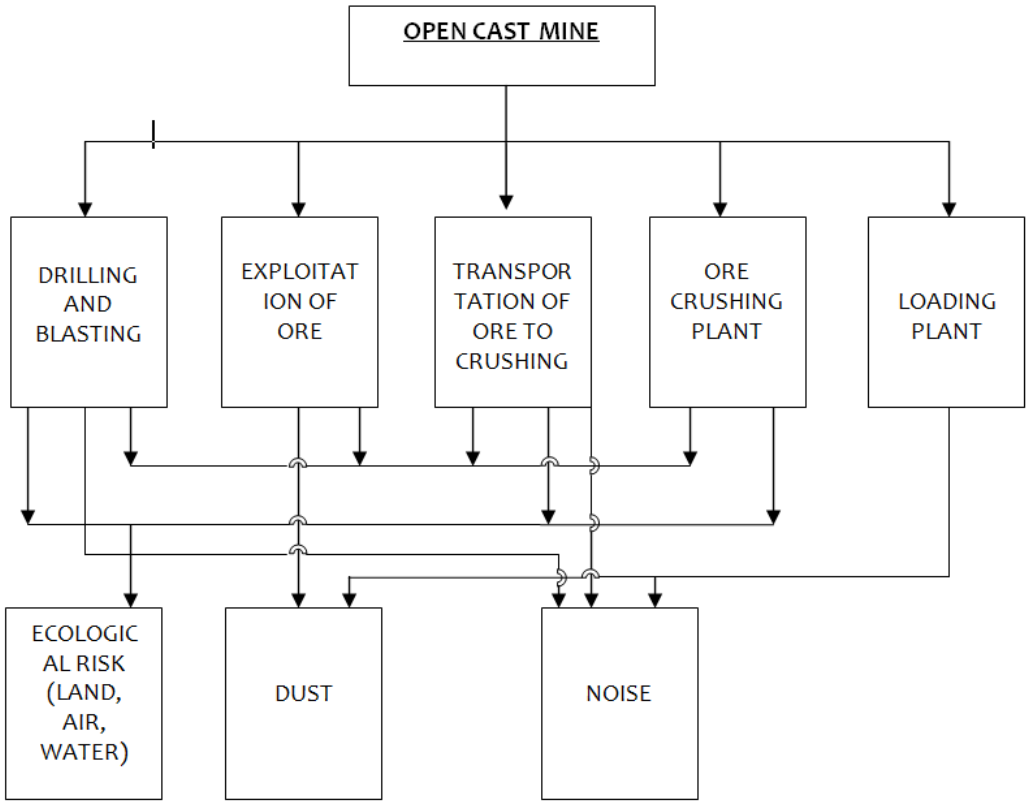
In order to take care of above hazard/disasters, the following control measures is being/ will be adopted:

- All safety precautions and provisions of Mine Act,1952, metalliferous Mines Regulation, 1961 and Mines Rules,1955 will be strictly followed during all mining operations;
- Entry of unauthorized persons is prohibited;
- Firefighting and first-aid provisions in the mines office complex and mining area;
- Provisions of all the safety appliances such as safety boot, helmets, goggles etc. has been made available to the employees and regular check for their use;
- Training and refresher courses for all the employees W in hazardous premises; Under Mines vocational training rules all employees of mines shall have to undergo the training at a regular interval;
- W of mine, as per approved plans and regularly updating the mine plans;
- Cleaning of mine faces is being/ will be regularly done;
- Handling of explosives, charging and blasting is being/ will be carried out by competent persons only;
- Provision of magazine at a safe place with fencing and necessary security arrangement;
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines;
- Suppression of dust on the haulage roads;
- Adequate safety equipment is being/ will be provided at explosive magazine; and

- Increasing the awareness of safety and disaster through competitions, posters and other similar drives.
- For any type of above disaster, a rescue team has been formed by training the mining staff with specialized training.

### Possible hazards in open cast mine

- There are various factors, which can cause disaster in the mines. The mining activity has several disaster prone areas. The identification of various hazards is shown in figure-7.1 and the hazards are discussed below:




### Blasting

Most of the accidents from blasting occur due to the projectiles, as they may sometimes go even beyond the danger zone, mainly due to overcharging of the shot-holes as a result of certain special features of the local ground. Flying rocks are encountered during initial and final blasting operations. Vibrations also lead to displacement of adjoining areas. Dust and noise are also problems commonly encountered during blasting operations. As this region is hilly in nature so there is a possibility of Landslides due to Blasting in the mine.

### Overburden

The overburden dumps may cause landslides. High overburden dumps created at the quarry edge may cause sliding of the overburden dump or may cause failure of the pit slope due to excessive loading, thereby causing loss of life and property. Siltation of surface water may also cause run-off from overburden dumps.

### Heavy machinery

Most of the accidents during operation of dumpers, excavators and dozers and other heavy vehicles are often attributable to mechanical failures and human errors.

### Storage of explosives

Explosive magazine storage facility is located within the existing ML area which will cater to the existing mining activities in the same ML area. For the purpose of transportation of explosives, explosive van is present. The main hazard associated with the storage, transport and handling of explosives is fire and explosion. The rules as per the Indian Explosive Act-1983 and Explosive Rules-2008 should be followed for handling of explosives, which includes transportation, storage and use of explosives.

### Fuel storage

Most of the HEMM will operate on diesel. However, no major storage is envisaged at the ML area.

### Waterlogging

The rainwater would flow down the slope of the hills and also along the natural streams. Rain water Harvesting has been proposed and water is being stored in the pit for use.

### Disaster management plan

### Objectives of Disaster management plan

The disaster management plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the disaster management plan, it should be widely circulated and personnel training through rehearsals/drills.

The objective of the Disaster Management Plan is to make use of the combined resources of the mine and the outside services to achieve the following:

The objective of onsite disaster management plan for the captive mine is to be a state of perceptual readiness through training, development to immediately control and arrest any emergency situations, so as to avert a full-fledged disaster and the consequence of human and property damage. In the event of a disaster still occurring & to manage the same so that the risk of the damage to life and property is minimized.

### The salient features are elaborated as below:

Effect the rescue and medical treatment of casualties;
Safeguard other people;
Minimize damage to property and the environment;
Initially contain and ultimately bring the incident under control;
Identify any dead;
Provide for the needs of relatives;
Provide authoritative information to the news media;
Secure the safe rehabilitation of affected area; and
Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.
In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

## EMERGENCY ORGANIZATION

It is recommended to setup an Emergency Organization. (Mine Manager) who has control over the affairs of the mine would be heading the Emergency Organization. He would be designated as Site Controller. As per the General Organization chart, in the mines, the Mines Manager would be designated as the Incident Controller. The Incident Controller would be reporting to the Site Controller.

Each Incident Controller, for himself, organizes a team responsible for controlling the incidence with the personnel under his control. Shift In-charge would be the reporting officer, who would bring the incidence to the notice of the Incidence Controller and Site Controller.

Emergency coordinators would be appointed who would undertake the responsibilities like firefighting, rescue, rehabilitation, transport and provide essential and support services. For this purposes, Security In-charge, Personnel Department, Essential services personnel would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, electrical fitters, pump house in-charge and other maintenance staff would be drafted for emergency operations. In the event of power or communication system failure, some of staff members in the mine offices would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

Following officers of the mines are responsible for co-ordination in case of emergency situation in any section of the mine. All are based at residential colony of the company at a distance of 2 Km from the mine site. Their organizational position and telephone nos. are as follows:

## OFF-SITE EMERGENCY PLANNING

### INTRODUCTION

The off-site emergency plan is an integral part of any hazard control system. It would be based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans should, therefore, complement each other. The key feature of a good off-site emergency plan is flexibility in its application to emergencies other than those specifically included in the formation of the plan. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority.

Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. As with the on-site plan, an emergency control center will be required within which the emergency coordinating officer can operate. An early decision will be required in many cases on the advice to be given to people living “within range” of the accident – in particular whether they will be evacuated or told to go indoors. Consideration of evacuation may include the following factors:

In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation, although a severe smoke hazard may require this to be reviewed periodically.

But if the fire escalates it might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people would be advised to stay indoors and shield themselves from the fire while measures are taken by those outside to douse fire.

## ASPECTS TO BE INCLUDED IN AN OFF-SITE EMERGENCY PLAN

Some of the aspects to be included in off-site emergency plan are as follows:

### a) Organization

Details of command structure, warning systems, implementation procedures, emergency control centers, name and appointments of incident controller, site main controller, their deputies and other key personnel.

### b) Communications

Identification of personnel involved, communication center, call signs, network, list of telephone numbers.

### c) Special Emergency Equipment

Details of availability and location of heavy lifting gear, bulldozers, specified fire-fighting equipment, fireboats.

### d) Voluntary Organizations

Details of organizers, telephone numbers, resources, etc.

### e) Meteorological information

Arrangements for obtaining details of weather conditions prevailing at the time and weather forecasts will be made.

### f) Humanitarian Arrangements

Transport, evacuation centers, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

### g) Public Information

Arrangements for: -
Dealing with the media-press office
Informing relatives, etc.

### h) Assessment

Arrangements for: -
Collecting information on the causes of the emergency
Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

## ROLES OF MAJOR HAZARD MANAGEMENTS

Where the local authority has the organization to formulate the plan, the role of management in off-site emergency planning has/ will establish liaison with those preparing the plans and to provide information appropriate to such plans. This will include a description of possible on-site accidents with potential for off-site harm, together with their consequences and an indication of the relative likelihood of the accidents.

Advice should be provided by works managements to all the outside organizations which may become involved in handling the emergency off-site and which will need previously to have familiarized

themselves with some of the technical aspects of the works activities, e.g. emergency services, medical departments, etc.

## 25 DETAILS OF THE OCCUPATIONAL HEALTH ISSUES IN THE DISTRICT. (LAST FIVE-YEAR DATA OF NUMBER OF PATIENTS OF SILICOSIS & TUBERCULOSIS IS ALSO NEEDS TO BE SUBMITTED);

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations. The prevention among workers of departure from health cause by their W conditions, the protection of workers at there employment from risks resulting from factors adverse to health, the adoption of work to men and each man to his job. in recent years the application of ergonomics has made a significant contribution for reducing industrial accidents and overall health efficiency of workers

OCCUPATIONAL HEALTH

The industrial workers today is placed a highly complicated environment which is getting highly complicated as man becoming ingenious. An industrial worker may be exposed to many types Dieses depending upon the occupation.

diseases due to physical agent
Heat –heat hyperpyrexia, heat cramps
Cold-Trench foot, frost bite, chilblains
Pressure-caisson disease, air embolism
Noise-Occupational deafness
Radiation- Cancer, Leukemia, Pancytopenia
Mechanical Factor- Injuries, Accident
diseases due to chemical agent
Various toxic gases like carbon dioxide, carbon monoxide causes various type of diseases. Anthracnose, silicosis, siderosis, bagassosis etc.
Diseases due to biological agent
Brucellosis, anthrax, fungal infection etc.
Diseases of Psychological organs-industrial neurosis, hypertension, peptic ulcer etc.

| year | Silicosis | Tuberculosis |
|---|---|---|
| 2019-20 | Nil | 852 |
| 2020-21 | Nil | 690 |
| 2021-22 | Nil | 674 |
| 2022-23 | Nil | 799 |
| 2023-24(till 31-10-2023 | Nil | 714 |

## 26 PLANTATION AND GREEN BELT DEVELOPMENT IN RESPECT OF LEASES ALREADY GRANTED IN THE DISTRICT;

Specific conditions are being imposed by the state pollution control board during grant of consent to operate to the mines to developed adequate no. of plantation as per the recommendation made in the approved mining plan during operation period and closure of mining activity. As most of the mines of the district are yet to be exhausted of their mineral content no sort of reclamation measures has been undertaken excluding gap plantation of local species in the peripheral safety zones of the quarries/clusters and in some of the haul road.

## 27 ANY OTHER INFORMATION.

-NIL-

# 28 MONITORING & EVALUATION

The Ministry of Environment, Forest & Climate Change has published "Enforcement & Monitoring Guidelines for Sand Mining" in the year 2020 wherein Monitoring Mechanism has been defined very specifically and recommended that a uniform monitoring mechanism is required to assess the regulatory provision in quantitative terms, with robust institutional and legal framework. Based on past experience and suggestions available, the following requirements are suggested for defining a mechanism for monitoring of mining activities which will help in identification of mining which is operating either illegally or are violating the regulatory provisions. Some suggestion will facilitate direct or indirect information to help in such an assessment.

1. All precaution shall be taken to ensure that the water stream flows unhindered and process of Natural river meandering doesn't get affected due to mining activity.
2. River mining from outside shall not affect rivers, no mining shall be permitted in an area up to a width of 100 meters from the active edge of embankments or distance prescribed by the Irrigation department.
3. The mining from the area outside river bed shall be permitted subject to the condition that a safety margin of two meters (2 m) shall be maintained above the groundwater table while undertaking mining and no mining operation shall be permissible below this level unless specific permission is obtained from the Competent Authority. Further, the mining should not exceed nine-meter (9 m) at any point in time.
4. Survey shall be carried out for identifying the stretches having habitation of freshwater turtles or turtle nesting zones. Similarly, stretches shall be identified for other species of significant importance to the river eco-system. Such stretch with adequate buffer distance shall be declared as no-mining zone and no mining shall be permitted. The regulatory authority as defined for granting Environmental Clearance, while considering the application of issuance of ToR and/or EC for the adjacent block (to non-mining zone) of mining shall take due precaution and impose requisite conditions to safeguard the interest of such species of importance.
5. District administration shall provide detailed information on its website about the sand mines in its district for public information, with an objective to extend all information in public domain so that the citizens are aware of the mining activities and can also report to the district administration on any deviation observed. Appropriate feedback and its redressal mechanism shall also be made operational. The details shall include, but not limited to, lease area, geo-coordinates of lease area and mineable area, transport routes, permitted capacity, regulatory conditions for operation including mining, environmental and social commitments etc.
6. A website needs to be maintain to track the movement of centralised sand mining and a Centralised server system should be made to manage the data related to sand mining across India.
7. The mineral concession holders shall maintain electronic weighbridges at the appropriate location identified by the district mining officer, in order to ensure that all mined minerals from that particular mine are accounted for before the material is dispatched from the mine. The weighing bridge shall have the provision of CCTV camera and all dispatch from the mine shall be accounted for.
8. The mineral movement shall be monitored and controlled through the use of transit permit with security features like printing on IBA approved MICR papers, Unique bar/QR, fugitive ink background, invisible ink mark, void pantographs and watermarks papers or through use of RFID tagged transit permits and IT /IT-enabled services. Such monitoring system shall be created and made operationalised by State Mining department and district level mining officer shall be responsible for ensuring that all legal and operational mines are connected and providing the requisite information on the system.
9. State Government shall constitute a District Level Task Force (DLTF) under the Chairmanship of Deputy Commissioner/District Magistrate/Collector with Superintendents of Police and other

related senior functionaries (District Forest Officer, District transport officer, Regional officer-SPCBs, Senior Officer of Irrigation Department, District Mining Officer) with one/two independent member nominated by the Commissioner concerned. The independent member shall be retired government officials/teacher or ex-serviceman or ex-judiciary member. The DLTF shall keep regular watch over the mining activities and movement of minerals in the district. The DLTF shall have its regular meeting, preferably every month to reconcile the information from the mining activity, and other observations made during the month and take appropriate corrective and remedial action, which may include a recommendation for revoking mining lease or environmental clearance. The DLTF may constitute an independent committee of the expert to assess the environmental or ecological damage caused due to illegal mining and recommend recovery of environmental compensation from the miner's concern. The recommendation may also include action under the provision of E(P) Act, 1986.

10. The area not identified for mining due to restriction or otherwise are also to be monitored on a regular basis by the DLTF. Any observations of mining activity from the restricted area shall be reported and corrective measures shall be initiated on an urgent basis by the DLTF.
11. The dispatch routes shall be defined in the Environmental Clearance and shall be avoided through densely habituated area and the increase in the number of vehicle movement on the road shall be in agreement with the IRC guidelines / carrying capacity of the road. The alternate and dedicated route shall be explored and preferred for movement of mining to avoid inconvenience to the local habitat. The mining production capacity, by volume/weight, shall be governed by total permissible dispatch calculated based on the carrying capacity of dispatch link roads and accordingly, the production should be regulated.
12. The movement of minerals shall be reconciled with the data collected from the mines and various Naka/check posts. Other measures may also include a general survey of the potential mineable area in the district which has not been leased/auctioned or permitted for mining due to regulatory or other reasons.
13. The location and number of check post requirement shall be reviewed by DLTF on a regular basis so that appropriate changes in location/number could be made as per the requirement. Such review shall be carried out on a regular basis for the district on inter-state boundary or district providing multiple passages between two districts of different states.
14. The district administration shall compile the information from their district of the permitted and legal mined out minerals and other details and share such information and intelligence with the officials of the adjoining district (Inter or/and Intra State) for reconciliation. The information shall include the area of operation, permissible quantity, mined out minerals (production) the permitted route etc., and other observations, especially where the mine lease boundary is congruent with the district boundary. Such coordination meeting shall be held on a quarterly basis, alternatively in two district headquarters or any other site in two districts decided mutually by the District Magistrate.
15. The in-situ and ex-situ environmental mitigative measures stipulated as EMP, CER, CSR and other environmental and safety conditions in mines including the welfare of labours shall properly reflect in the audit report.

## 29 COMMENTS/ SUGGESTIONS:

HPSEIAA in its 69th meeting on dated 18th June, 2024 approved the DSR of district Sirmaur and decided to upload the DSR on public domain/ official websites of Department of Industries and Department of Environment, Science Technology & Climate Change for twenty-one days. The comments, if received, shall be considered and if found fit, shall be incorporated in the final Report. As per the decision of the HPSEIAA the DSR was uploaded on the portal. The suggestions received from the users through e-mail on ms.hpseiaa@gmail.com & remarks of the Industries Department are as under:

| # | District | Email dated | Comments | Forwarded to industries | Remarks from Industry Deptt., if any |
|---|---|---|---|---|---|
| 1. | Sirmaur | 17-Jul-24 | Not included in DSR - Extraction of Dolomite/Baryte situated in Khasra No. 3649, 3647, 3656, 3657 & 3658 measuring an area 13-11 Bighas (Private Land/Hill Slope) falling in Mohal/Mauza Gundah, Tehsil Shillai, District Sirmour, Himachal Pradesh, proposed by Sh. Bahadur Singh Prop. M/s Shiv Shakti Dolomite/Baryte Mine Jwana, R/o Village Bhatyori P.O. Bakras, Tehsil Shillai, District Sirmour, HP. | 18-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 2. | Sirmaur | 17-Jul-24 | Not included in DSR - Extraction of Sand, Stone and Bajri from Khasra No. 376/250/228 Measuring 03.91.12 Hectares or 46-08 Bighas (Private Land, River Bed) Falling in Mauza & Mohal- Bangran, Tehsil Paonta Sahib, District- Sirmaur, Himachal Pradesh. The project has been proposed by M/s OP Stone Crusher, Prop: Shri Om Parkash, R/o Village Ariyan Wala, P.O. Malakpur Bangarn, Tehsil Bilaspur, District Yamuna Nagar, Haryana | 18-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 3. | Sirmaur | 17-Jul-24 | Not included in DSR - Extraction of Sand, Stone and Bajri from Khasra No.404/162 Measuring an area 02-10-73 Hectares or 25.00 Bighas (Private Land, River Bed) falling in Mauza & Mohal Phoolpur Shamshergarh, District Sirmour, Himachal | 18-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |

| | | | | | |
|---|---|---|---|---|---|
| | | | Pradesh. The project has been proposed by Sh. Jaswant Singh, S/o Sh. Gyan Chand, R/o Village Salihar, Tehsil Khundion, Dist. Kangra, H.P. | | |
| 4. | Sirmaur | 17-Jul-24 | Not included in DSR - Extraction of Sand, Stone and Bajri from Khasra No. 162/2 & 159/1 Measuring an area 02-58-35 Hectares or 30.13 Bighas (Private Land, River Bed) Falling in Mauza & Mohal- Phoolpur Shamshergarh, District-Sirmour, Himachal Pradesh. The project has been proposed by Sh. Jaswant Singh, S/o Sh. Gyan Chand, R/o Village Salihar, Tehsil Khundion, Dist. Kangra, H.P. | 18-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 5. | Sirmaur | 17-Jul-24 | Not included in DSR - Extraction of Sand, Stone and Bajri from Khasra No. 1506/178/2, Measuring an area 2.90 Hectares or 34-07 Bighas (Private Land, River Bed) Falling in Mauza & Mohal Bhagani, Tehsil Paonta Sahib District Sirmour, Himachal Pradesh. The project has been proposed by Sh. Ram Swaroop S/o Sh. Kehar Singh, R/o Village Dandiwala, P.O, Rajpur, Tehsil Paonta Sahib, Distt. Sirmaur, Himachal Pradesh | 18-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 6. | Sirmaur | 16-Jul-24 | Not included in DSR -Prem Pal S/o Sh. Gopal Singh - Extranction of Sand Stone Boulder and Bajri Mining, Lease situated at Mauza and Mohal Mehat, Tehsil Paonta Sahib & Distt.Sirmaur over an area 2-7-36 ha (24-12 bigha) is not added in DSR | - | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 7. | Sirmaur | 09-Jul-24 | I have submitted my EC Proposal bearing proposal No. SIA/HP/MIN305948/2023.by the name M/s Sohan Singh and Meet Singh. In the DSR my name is present on page no 133, however the khasra no. has written in correctly the | 10th July 2024 | 16th July 2024 comments from Geologist (Zone-III) - As per the office record, the correct Khasra Nos. are 715/2 & 720/1 measuring 39-04 Bighas which are |

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| | | | correct Khasra nos are 715/2 and 720/1, and the area is 39-04 Bighas or 3.32 Ha. . | | incorrect and need to be updated. Accordingly, the same is updated of the DSR |
| 8. | Sirmaur | 4th July 2024 | Not included in DSR - Sh. Dev Dutt for Extraction of Stone and Sand for open sale located at Khasra No. 117/76/3) having an area of 19- 13 Bighas (Pvt. Land/ Hill Slope) , Mohal Lana Kansar (Upsampda Lana Kansar Sarahan), Tehsil- Pachhad, District- Sirmaur, Himachal Pradesh. | 05-Jul-24 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |
| 9. | Sirmaur | 18th July 2024 | With reference to the latest District Survey Report, Published on portal (Dept. of Environment Science and Technology Shimla, H.P.), The Letter of Intent was granted vide letter no. Udyog-Bhu (Khani-4) Laghu-168/2013 10356 Dated Shimla -171001 the 05.12.2023 But my Project M/s Kalgidhar trust, Village & Post office Baru Sahib, Tehsil Pachhad, District Sirmaur Himachal Pardesh having area 50-00 Bigha (4.2146 Ha) bearing Kasra no. 153/127/1 (Private Land/Hill slope) is not listed in the D.S.R. " S.R. no. 13". I request you to kindly consider my application for E.C. | 18th July 2024 | Please see point No. 13 of DSR as well as refer to the email sent on 19.07.2024 sent to ms.hpseiaa@gmail.com |

The Deptt. of Industries vide email dated 19th July, 2024 informed that the Department grants mineral concessions by two modes, one through auction and another through mining leases. In both the cases, as per the provisions contained in the Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015, the areas are inspected by the Joint Inspection Committee under the Chairmanship of SDO (Civil) concerned comprising members from other department like Irrigation & Public health, State Pollution Control Board, Forest Department, HP Public Works Department, Geologist or Mining Officer and as such, the letter of intents are issued only after recommendations of the Joint Inspection Committee which is continuous process.

The letter of intent is in-principle approval to obtain the required clearances for the grant of mineral concession. The applicant has to complete the codal formalities like preparation of a mining plan and has to obtain environmental clearance before the grant of mineral concession. As such, it is an ongoing process and as soon as the clearances are obtained, the letters of intent are converted into mining lease. Also, if the letter of intent holder is unable to obtain the required statutory clearances within the validity period of letter of intent, the period is either extended or withdrawn.

So, the list of letters of intents cannot be provided at this stage as these are dynamic in nature and only the information of granted mineral concessions is provided in the updated DSR.