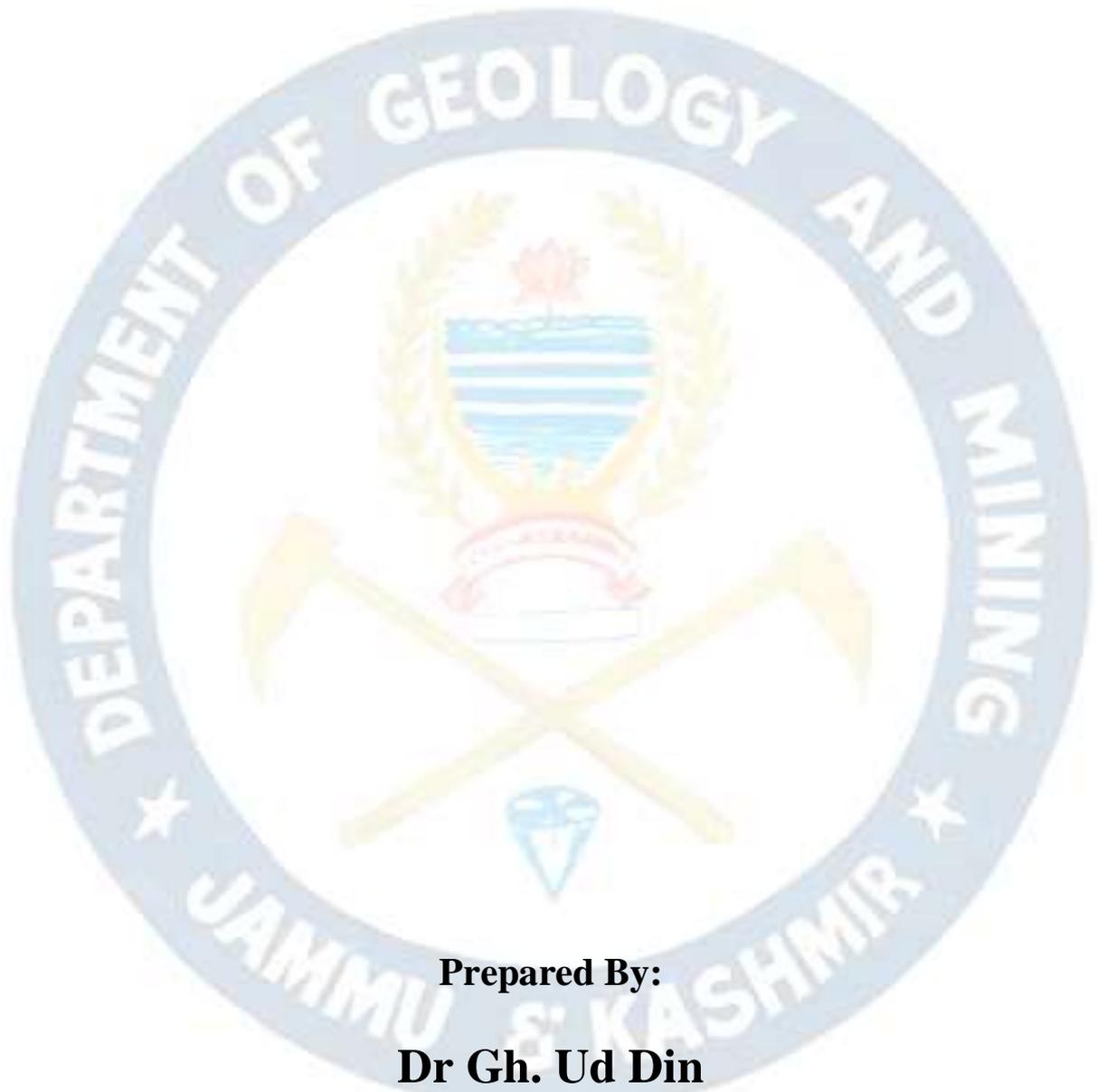


DISTRICT SURVEY REPORT OF KUPWARA DISTRICT



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CONTENTS

S. No.	Chapter	Page no.
01	Introduction	1-2
02	Brief History of the District	3-8
	a) Location & Accessibility	5
	b) Geographical set-up	5
	c) Climate	6
	d) Topography & Drainage	6
03	General Profile of the District	9-10
04	Overview of Mining Activities	11-12
05	Geology and Mineral Wealth of the District	12-17
06	Processes of Deposition of Sediments In the Rivers of the District	17
07	Details of Royalty or Revenue received in the last three years	18
08	Details of minor minerals production in the last three years	19

1. INTRODUCTION

With reference to the gazette notification dated 15th January 2016, ministry of Environment, Forest and Climate Change, the District- Environment Impact Assessment Authority (DEIAA) and District Environment Appraisal Committee (DEAC) are to be constituted by the Central Government for grant of environmental clearance for Category 'B2' Projects for mining of minor minerals, for all the districts in the country (hereinafter referred to as Authority for the districts) vide S.O. 190(E) dated 20-01-2016 comprising of the following members, namely:

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

The Authority (DEIAA) for the districts shall base its decision on the recommendations of the District Level Expert Appraisal Committee constituted under paragraph 5 of this notification. For the purposes of assisting the Authority for the Districts, the Central Government hereby constitutes the District Level Expert Appraisal Committee for all the districts of the country (hereinafter referred to as DEAC for the District) comprising of the following members, namely:-

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

The DEIAA (District- Environment Impact Assessment Authority) and DEAC (District Environment Appraisal Committee) will scrutinize and recommend the prior environmental clearance of ministry of minor minerals on the basis of District Survey Report (DSR).The main purpose of preparation of District Survey Report is to identify the areas of aggradation or deposition where mining can be allowed and identification of areas of erosion and proximity to infrastructural structures and installations where mining activities should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in the area. The District Survey Report shall form the basis for application for Environmental Clearance, Preparation of reports and appraisal of projects. This report contains details of Lease, Sand mining, other Mineral mining operations in the District and Revenue which comes from minerals in the district.

This report is prepared on the basis of data collected from different concerned Departments. The Report shall be updated once every five years. This District Survey Report contains mainly Geology, Mineral wealth, details of rivers/nallas, details of Lease and mining activities in the District along with Sand mining/river bed mining and revenue of minerals. The present document is the District Survey Report for the District Kupwara of the state of Jammu and Kashmir. District Kupwara is one of the newly created eight Districts of the state of Jammu and Kashmir. The District came into existence after being carved out of the erstwhile District Baramulla in the year 1979; the geographical area is 2379 sq. km. It is 90 km. from Srinagar, the summer capital the state of Jammu & Kashmir & is covered within the geographical coordinates 34°17' - 34° 21' Latitude 73° 10 -73° 16' E Longitude. It has an average elevation of 1615m above mean sea level.

2. BRIEF HISTORY OF THE DISTRICT

The beautiful district Kupwara is located in the state of J&K (Figure 1). Though no record proof is obtainable as to why Kupwara is called so, however, there exist a number of legends associated with it. A story goes that there was a small hut built by an unknown person in the nearby forest. This hut went by the name Kopar meaning a shabby hut. Many accidents would take place here especially related to the disappearance of animals; they would either roll down the hill or be killed by beasts. The neighboring area was named after this hut Kopar. Some elders of the region also believe that this name was given to the place by a saint named Zati Shah Wali who referred to the place as “Ko-pore” which meant people of bad repute. He called it so because children here would throw stones at him whenever he crossed it. Some others say the famed saint Syed Mohammad Gabi called it “Kufewari” which meant a land of skeptics. The tomb of this well-known saint located in the middle of Kupwara. Later the saint changed the people here and converted them into Islam. Therefore the customized and altered name of Kopar or kufewari is Kupwara. Kupwara was made out from district of Baramulla in 1979. The district headquarter is located 90 km away from Srinagar the summer capital of the state. Farming in Kupwara is the main occupation of the people as more than 80% of the population is engaged with it, thus made has the district as one of the important districts of J & K state. Main income of the district comes from agriculture. The district consists of hill stations and tourist destinations. The topography of the district represents a mix of mountains, valleys and streams offering tremendous potential for developing scenic and adventure tourism.

Bungus Valley- one of the relatively unknown areas of Kashmir with vast tourism potential in the valley of Bungus lying within the Trans-Himalayan area. It is a unique ecological combination comprising a mountain biome, which include grassland biome with flora at lower altitude. It lies at an altitude of 10000' (amsl) in the Northern part of the District Kupwara within Handwara Sub-district occupying an area of 300 sq. Km (15x20 sq. Km), the principal valley is locally known as Bodh Bungus (Figure 3). The valley is surrounded by Rajwar & Mawar in the East, Shamusberi and Dajlungun Mountain in the West & Chokibal and Karnagali in the North. It small valley known as lokut Bungus lies in the Northeastern side of the main valley.

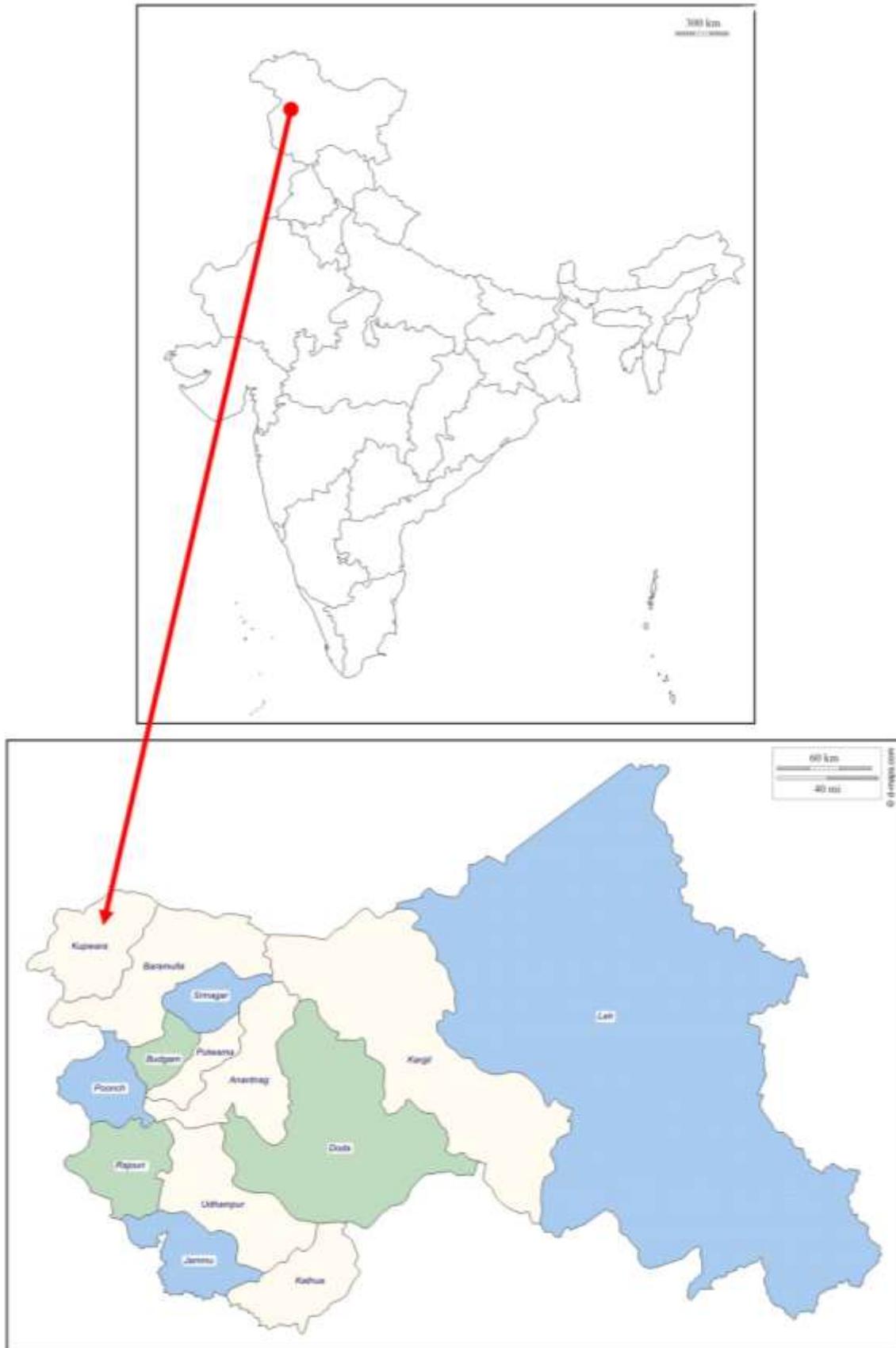


Figure 1: Location map of Kupwara district

Lolab valley, named after Maharaja Lolo, is known for its lush green forest and pastures stretching across nearly 25 km from Northwest to Southeast varying in breadth from few yards to 5 km. It is traversed by a stream known as Lalkul (Lahwal). It is also known for the Satbaren & a cave in the Jungles of Madmadav. Lolab valley has a well-developed infrastructure & good connectivity with rest of the region. It provides road connectivity to Machil which is known for the waterfall –Rangil. Lolab has been appreciated by the saints, poets & philosophers for centuries together. Satbarran Kularoos a unique place where the past & the present architecture meet, a unique place of ancient architecture situated on the outskirts of the village Madmadav village in Kalarooch area. Dranyari 7.5 km from Chockibal Kupwara is considered a complete tourist destination in itself & is very famous among the local population. It lies on the foothills of the Nattishanner Gali on the road leading to Karnow valley. The River Kishanganga originating from the Himalaya, flows through the outer areas of the district East to the West and finally merges into the river Jhelum at Domel in POK.

a) Location and Accessibility

Kupwara district falls between $34^{\circ}19'49.2''$ - $34^{\circ}39'22.7''$ North Latitude and $73^{\circ}45'20''$ – $74^{\circ}35'10.00''$ East Longitude, covered under Indian Survey Sheet no.43^J/2,43^J/3,43^J/7,43^J/14 and43^J/15 with average altitude of 1615m (amsl). Kupwara is the backward frontier district of Kashmir Valley, has a well developing infrastructure and road connectivity from District Headquarter to the far flung areas. It has good road connectivity with its neighboring District like Baramulla and Bandipora and are connected with the Summer capital (Srinagar) of J& K through (a) Srinagar- Kupwara National Highway through Baramulla and (b) Srinagar– Kupwara road through Sopore.

b) Geographical Set-up

The Name Kupwara is derived from ‘Kuferwari’ which meant a land of Skeptics. Syed Mohammed Gabi well known saint who’s tomb lies in the middle of the Kupwara altered the name Kuferwari into Kupwara. Kupwara District is full of scenic beauty. Dense forests & rich wild life make it significant from tourism & wildlife point of view. The famous River Kishenganga separates POK in Machil, Karen Titwal areas. Kupwara district lies on the Northwest side of Kashmir Valley with borders lying on the line of control (LOC) that

divides India & Pakistan. On the Southeastern to Southwestern side of Kupwara lies Sopore, Badipora & Baramulla respectively.

c) Climate, Fauna and Flora

Kupwara district experiences warm and temperate climate and snowfall is limited between Dec. to April. It experiences a pleasant weather from April to Oct. with scanty rainfall. The annual average rainfall is 843mm & the average annual temperature 14.1⁰C. The higher reaches experience severe winter with heavy snow fall and the rains are common in these areas besides these rugged areas experiences scanty rains during lean spells that result drought like conditions. Nature has been very kind to Kupwara. Dense forests & rich wildlife make the district significant from the tourist point of view. The pastures of the highlands like Bungus are the regular haunts of the cheerful shepherds who bring up their flocks for grazing. The higher reaches around the district headquarter are coated with dense forests which besides lending charm are a great factor of healthful fragrance to the atmosphere. The best varieties of pine and deodar are found in these forests specially the Lolab valley is rich in them. There is wide range of wild life among the animals blackbear, redbear, tigers, markhor, wildbuls and muskdeer are found in these forests.

d) Topography and Drainage System of the District

The entire topography of the district is mountainous with rugged terrains ,steep slopes &very high relief characterized by high peaks like Nasta Chhun (3128m) & Taya (3048m) in the Shamshabari Range and the peaks like Kalai (3827m), Birindar (3638m) , Kowatdav(2706m) & Mangawar (2656m) located in the higher reaches of Machil and Lolab , form part of the Inner Kashmir Himalayan Ranges & the water shed between the Kishanganga & the Jhelum Valleys (Figure 3). On the whole the area is thickly forested which resulted in the growth of thick soil cover thereby restricted the free flow of water & at the same time concealed the Rock Formations existing in the area. The topography of the district represents a mix of mountains, valleys and streams offering tremendous potential for developing scenic and adventure tourism. The rugged topography is characterized by high peaks & precipitous slope indirectly reflecting the rock type and their fabrication (texture & Structure). The Panjal Volcanics & Low grade metamorphosed Precambrian rocks with wide spread distribution in the district; & the early to middle Palaeozoic Formations (existing along the Shamsabari Syncline in the Northern end that represent the core of the Syncline) being resistant to weathering stand out thereby forming abrupt cliffs, escarpments, deep incised gorges& steep

longitudinal profiles due to the differential erosion at lithological contacts. These mountain Valleys are traversed by subsidiary fault lines/lineaments which are the main cause responsible for landslip/landsliding. Along the low-lying areas Precambrian rocks crop out in the form Hillocks encircled by the soft rock formations of the Karewa Group.

The Kupwara district is drained by the streams like Khamil, Pohru, Talri, Mawar, Hardahkhaer, Varno-Lolab (Figure 2). These nallas flow over heterogeneous rock types. The headwater region is composed of hard rock terrain such as Panjal Trap, Quartzite inclusions, Dogra Slate, Gneissose Granite, Phyllite and Arenite, however, for most of their reaches they flow over soft rock terrain i.e. Karewa & river alluvium. In general these nallas have a larger catchment area & originate from many dispersed tributaries in their source area. These nallas drain mostly over soft Karewa terrains with some prominent geomorphic features, for example, much wider appearance, gentle to steep valley slopes, lateral shifts, braided bar deposits (Mawar, Khamil and Talri) than over hard rock terrains where they have narrow course, are entrenched and have steep valleys. While descending from different hard rock terrains, these nallas enter soft rock terrain of Karewa & Recent to Sub-Recent Alluvium. Most of the nallas merge into Phoru river before entering the River Jhelum. These Nallas are the main source of coarse aggregate which cater to the need of all those agencies which consume the sand, bajri and gravel for various construction purposes & developmental works carried out in the district. These streams have special geographic importance in the district. The entire drainage pattern has resulted in land erosion & sculpture of divergent types of topography. In the hard rock terrains in the upstream course, the drainage divide is distinct whereas in the downstream course, the drainage divide is with the adjacent sub-basins are anomalous because of inter-basin cross-over of streams.

The Khamil nalla forms the main drainage system of the Trehgam area, having roughly an East –West trend. The nalla flows from West to East upto Kupwara where it is joined by the a prominent nalla from the East and after taking a Southerly bend forms what is known as River Phoru. The Khamil nalla is fed by numerous tributaries both from the North & South These tributaries include Kuzipther, Mannu, Reshwar. The Khamil nalla is fed by snow & the springs. The discharge is hardly sufficient for irrigation as it decreases with seasonal changes. The development & the courses of the Khamil nalla & its tributaries are to a large extent controlled by the major & minor geological structures as is indicated by presence of springs & the abrupt underground disappearance & re-appearance of the water after long distances (Table 2).

In Drangiyari- Tangdhar area, the Eastern part is drained by the North- South flowing Drangiyari Nar fed by several perennial streams like Bod Nambal Nar, Sari Nar etc. The Western part of this area is drained by the East-West flowing Zasla Nar in which several tributaries flow down from both sides forming the Batmaji Nar which merges into the Kazi nag nalla & at end it merges into the Kishanganga River near Titwa.

The main drainage pattern in the Lolab–Machil area is of dendritic type. The ridge between Hummer & Birindur peaks forms the water shed between the Northerly drainage of Machill area & the Southerly drainage of Kalaruch Kupwara area. The Machill nala joins the Westerly flowing kishanganga river further North. In the Kupwara Lolab area the Westerly flowing Machhar nal forms the main drainage that is fed by the Southerly flowing tributaries like the Gogal Nar, Kalaruch Nar etc. Futher West the Machhur Nala is named as the Lolab Kol that joins the Easterly flowing Khamil Nala, South of Kupwara, to form the South-Easterly flowing what is known as the Phoru River. Between Drugmul and Mundij to the South-East, the Phoru is further fed by a number of Southerly flowing smaller tributaries. The Phoru river which has a meandering course, joins the Jhelum river at South-West of Spore town. Mawar nalla is a pristine mountain stream originating from Qazinag range. This nalla is the main drainage of the Langate area, having west to east trend. This nalla flows from west to east upto Kachor where after it takes a Southern bend till it merges with the Pohru River at Malbagh. It has a long & wide catchment area, is fed by snow melt and perennial springs. Hardhakhar is an important tributary of Mawar. Numerous irrigation cannals take off along the course of the nalla. It has steep to moderate bed slope with heavy bed material movement during floods. The highest flood discharge is 15000 cusecs. This nalla flows over heterogeneous rock types. The headwater region is composed of hard rocks such as panjal trap & granite, however, for the most part of it reaches it flows over soft rocks terrain i. e, Karewa. It is main source of building material to Kupwara.

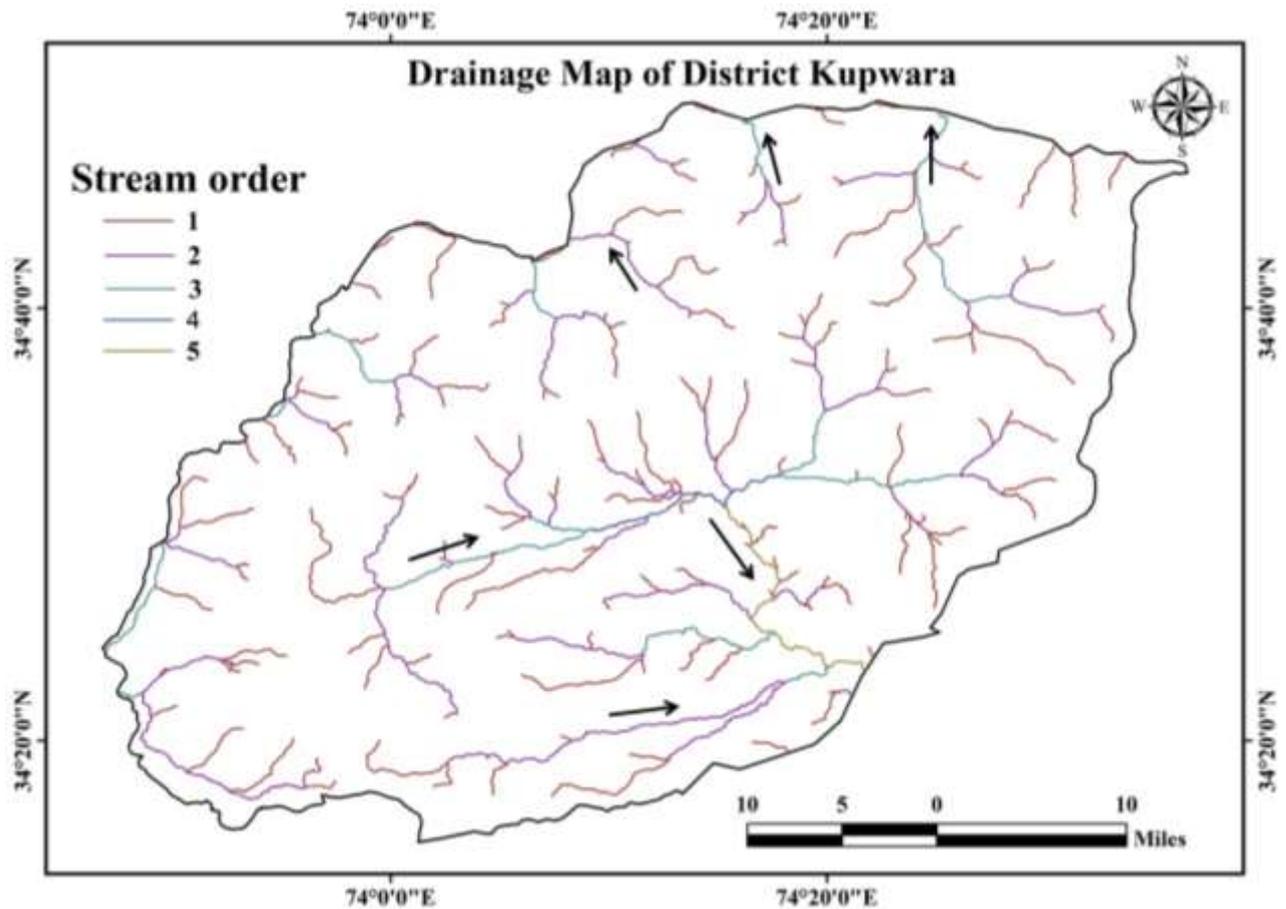


Figure 2: Drainage map of Kupwara district

3) GENERAL PROFILE OF THE DISTRICT

The district Kupwara is backward frontier district of Kashmir Valley. Kupwara Town is the administrative headquarter of the district with Handwara as sub-district. The district has well road connectivity. According to the 2011 census, Kupwara district has a population of 875,564 roughly equal to the nation of Fiji or the US state of Delaware. The District was carved out of Baramulla in the year 1979; the geographic area is 2379 sq.km. It is bounded in the East & South by the Baramulla & Bandipora District in the west & north there is LOC which separates it from Muzaffarabad (Pakistan). The lofty mountain ranges of Shamsabari, Pir Panchal make the district post card hill station. The lush green meadows of Bedi Behak, Bungus, Lolab & Dringyari with rocky streams flowing through the valleys make them delightful picnic spots although not yet fully developed to attract tourists to boost up economy of district & explore nature. The climate of the district is pleasant in spring, moderate in summer & cold in winter. Temperature rises to 37° C in summer to more than -10° C Forests of Kupwara have Deodar, Kail, Fir, Pine and Elmin abundance. Kupwara is

known for its Walnuts. Administratively Kupwara is divided into 11 blocks which include Sogam, Tangdhar, Titwal, Ramhal, Kupwara, Rajwara, Kralpora, Langate, Wavoora, Trehgam, and Kalarooch. Kupwara is having 2582 villages. Four tehsils viz. Kupwara, Handwara, Karnah and Langate. Famous springs include Kazinag, Trehgam Nag, Ghazinag & Shumnag.

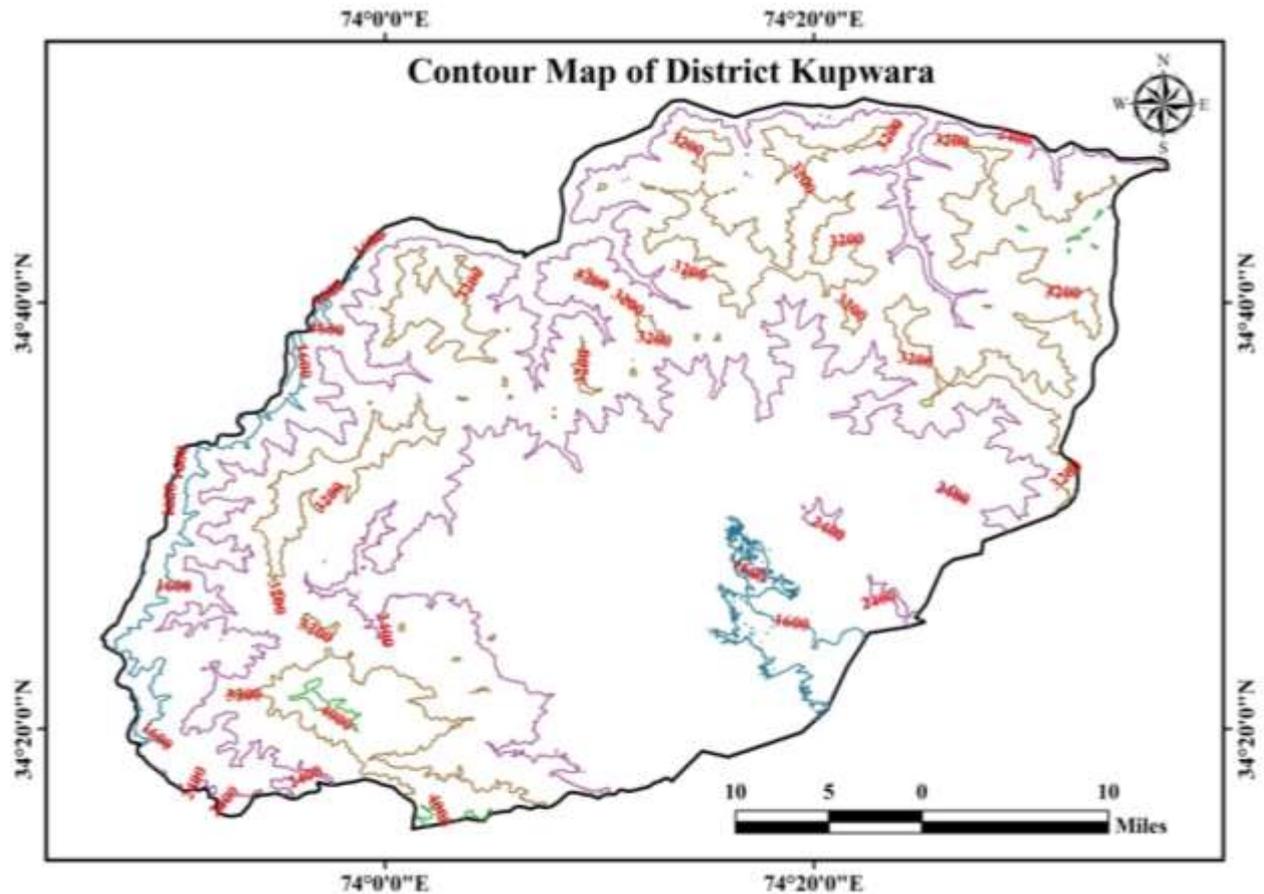


Figure 3: Contour map of Kupwara district

Demography

There are five tehsils in the Kupwara district namely Kupwara, Handwara, Lolab, Karnah & Langate with total population of 8,75,564 as per the census of 2011 out of which 4,74,190 are females while as 3,96,164 are male. The district has a population density of 366 /sq. km. The population growth rate over the decade 2001-2011 was 34.62%. Kupwara has a sex ratio of 843 females for every 1000 males & the literacy rate of 66.92%. Figure 4 shows the overall land use/land cover pattern throughout the district.

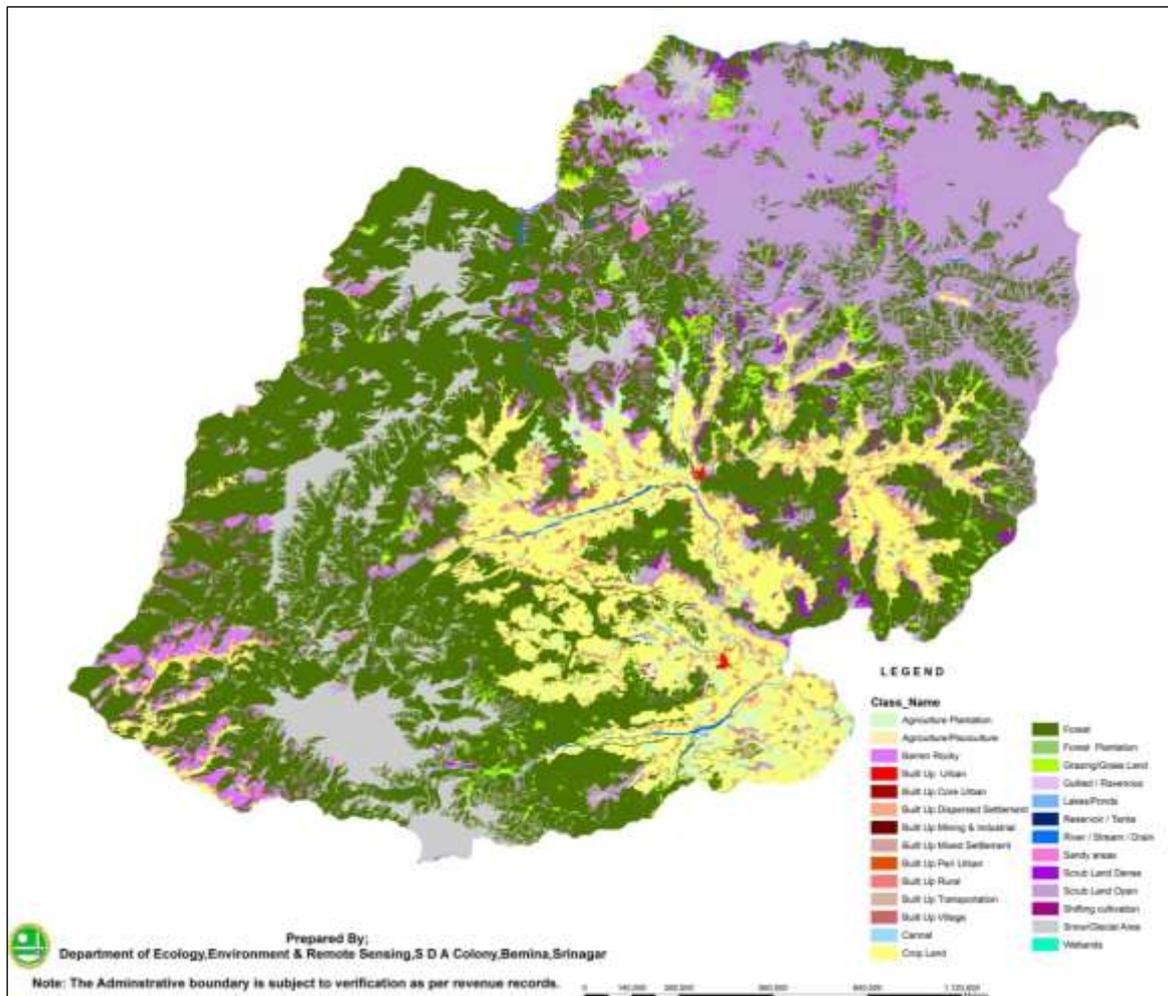


Figure 4: Land utilization map of Kupwara district

4) OVERVIEW OF THE MINING ACTIVITY IN THE DISTRICT

Coarse aggregate which form the basic raw material for cement concrete is extracted from the main Nallas like Pohru, Khamil, Talri and Mawar. These Nallas are the main source of coarse aggregate which cater to the need of all those agencies which consume the sand, bajri and gravel for various construction purposes & developmental works carried out in the district. Coarse aggregate (natural gravel) which form the basic raw material for cement concrete is available along the beds of Mawar , Khamil, Varno-Lolab is usually extracted , however, the recent trend has been to use crushed siliceous Limestone or Panjal Volcanic rocks for aggregate. Number of stone crushers installed in parts of the district to coupe up the demand from rural development Departments. Stone quarries presently non-functional are located at Khazanmatti, Kralpora, Shumnag,Gugloos Bala, Magam Handwara,Wudpora

Handwara where basalt, siliceous limestone, sandstone, Phyllite was quarried manually & cut into blocks for road metal & construction use.

Exploratory mining (aditing) and drilling carried out in the Dardpura forest hill spur near Lashtial in the Kalaruchh valley, Lolab at an elevation of 2134 m reveal presence of persistent mineralization, quartz vein width from 6m to 12m & strike extension of 28m & depth continuity of 600m. The vein is a fissure filling fault zone. The old working are in the zone of oxidation in which the leaching & re-deposition in the zone of oxidation has taken place. Sulphide mineralization in the quartz vein trending in S-W direction from Lashtial to Lalpat , covering 1.6 km. Copper content of the mineral zone varies 0.04 - 0.40% with an average content of the lode is 0.14, the arsenic content varies from 50 – 600 ppm. Evidences of mineralization in the vein/ mine is furnished by the presence of Malachite & Azurite encrustation (blue color).These are Gossans showing primary sulphide other than Pyrite and Marcasite. The old workings are in the zone of oxidation in which leaching & re-deposition of cu-carbonate has taken place. Prospecting is still on for copper deposits in the district which merit further exploration. Sizeable deposits of lignite associated with Karewa Group occur In Nichahom in Handwara Tehsil. Middlemiss (1924) estimated lignite reserves at Nichahom to be 80 million tons. The lignite seams showing rapid variation in thickness & quality. Drilling operations were conducted by geology & mining in the Nichahom-Chowkibal areas where the reserves estimated at 4.5 million tons up-to the depth of 38m. This lignite was stated to be poor quality with ash from 25-50%, moisture from 20-35% & calorific value 2200-4500BTU/Ib. The outcrops of marble at waterkhani, as also several other bands in Awra-Zirhama sector to North-West were exploited as an ornamental stone. For this reason the district has witnessed a sprawling growth of marble industries. Department of Geology & Mining established 50 million cubic meters of marble in the district Kupwara followed by grant of 25 no. mining leases in 1981. Only 08 applicants continued exploitation till the unfavorable circumstances in the Valley prevailed that led to the closure of their units.

05) GEOLOGY AND MINERAL WEALTH OF THE DISTRICT

The oldest rock Formation covering a large part of the District is that of the Salkhalas. It exact thickness is not determinable because of the extreme amount of folding and imbrication which these rocks have undergone. The Formation has been named Salkhalas from a little hamlet situated on the left bank of Kishanganga in the Karnah where the Formation is found developed in a typical form in a wide outcrop (Table 1). This Formation comprises a thick &

monotonous pile of dark grey phyllites, frequent graphitic and ferruginised, thin crystalline limestone and flaggy quartzite. The Outcrops of the Lower Paleozoic exposed within the two synclines (Marham & Shamasabri) pass downwards into Precambrian & the entire sequence rests on a Schistose Basement (Salkhala Formation) . The contact being usually a faulted one. The Salkhala rocks of the Tangdhar valley evince considerably less metamorphism than those of North side of the Basin. Granitisation is absent here except in the aureole round the Kazi nag massif. The inner margin of the Salkhalas comes in contact with the Dogra Slates or they undergo Cambrian beds near Nava Gabra for about 8km, such a contact is also observed along a stretch of many km on the south limb of the Shamasabri Syncline of palaeozoic strata at the head of Batamaji stream. From Dhanni to beyond Gabdori, Dora slates overlies compact black Argillites (graphite bearing slates& dolomitic limestone & passes upwards into a very thick succession of sandstone & slates. According to D. N. Wadia the Dangiyari & Tangdhar areas occupied by Salkhalas & Dogra Slates (Machhil Formation).

The name Machhal Formation is introduced by Raina & Razdan (1975) for a thick pile of interbedded slate & phyllites typically developed in Machhal area & corresponds to the Dogra slate Formation of Wadia. The Machhal Formation pass vertically into Lolab Formation with a gradational contact. The age of the Machhal Formation (Dogra slate) could vary from Pre-Cambrian to Lower most Cambrian. This Formation has a maximum outcrop width of 10 km. The prominent ridges like Zand Dodi, Chandankhal etc, & valleys of Korwali-Pushwari of Machhal area are located within this Formation (Figure 5).

Pohru Group is being introduced to the large thickness of Early to Middle Palaeozoic strata that are so well exposed on the either side of the Pohru Valley in a continuous & almost uninterrupted succession of rock Formations ranging in age from the Earliest Cambrian to Devonian .These rock Formations have their individual lithological characteristics & faunal content which has therefore enabled five-fold classification of the Pohru Group into litho-unit name informally as Formations- A,B,C,D & E. Some of these Formations are also exposed along the Northern & Southern hill slopes of Machhal Nala, extending into the upper reaches of the Lolab valley. In Pohru valley Formation A (lolab/ Sagipura) Lower Middle Cambrian – Lower Cambrian, is exposed along the Left bank hill slopes of Pohru river. This comprises a large thickness of 500m predominant siltstone quartzite arenite & Graywack. This Formation is overlain by the Formation B (Nutunus Formation) despite its relatively small thickness is highly fossiliferous & shows a complete development of Middle & Upper part of Middle Cambrian. This Formation is exposed all along the upper reaches of Kandi-

Natunus catchment area. Large part of this Formation is concealed either under the Karewa or under the alluvium of Pohru river. The Nutunas Formation is succeeded by the Formation C or the Trehgam Formation well exposed on the right bank of Pohru river in the Wodhpura-Gosain Tang hill slopes & on the left bank of the river between Waterkhani and Drugmulla . This Formation has a maximum thickness of 550m & its type section is exposed to the East of Waterkhani. In addition to the several smaller bands & lenticules of limestone, the Formation is characterized here by a thick unit of about 225m of highly siliceous & recrystallized limestone/ marble extending over a strike of 2.5km. The age of this Formation has been assigned Lower Ordovician–Late Middle Cambrian.

Rocks belonging to the Ordovician- Silurian age are reported from the ridge just East & East-South-East of Drugmulla village. The area was hitherto considered to belong to Middle – Upper Cambrian By Wadia (1934) & others (Shah, 1968).

The occurrence of small outcrops of volcanic rocks within the Early Palaeozoic succession in Kupwara district is being reported which may have important bearing on the geological history & palaeogeography of the period. These rocks occur in the form of purple colored vesicular tuffs & as thin flows of vesicular & amygdaloidal lava exposed in the hill slope to the North of Waterkhani /Tenkipur in Khurhama with an outcrop width of 25m however, its exact position in the stratigraphic column is not fixed. The Upper Cambrian is completely exposed at Trehgam. It is composed of a thick sequence of alternating shale & limestone which towards the top bear a Middle Ordovician Fauna. A prolonged period of non-deposition was witnessed in the area after the Ordovician- Silurian times as the next succeeded sequence belongs to the Panjal Volcanic System of Upper Carboniferous to Upper Triassic age. The Drangyari- Tanghdar area is occupied by the Salkhalas, Dogra Slate (Machhal Formation), Lower Cambrian, Middle & upper Cambrian, Ordovician- Silurian, Muth-quartzite, Agglomeratic Slate & Panjal Trap, for forming the Northern limb of the Easterly Plunging Shameshabri syncline with its closer South of Tangdhar. Thick band of Quartzite is found to occur in the North of Tangdhar.

Quaternary deposits occupy a very large tract of the Pohru valley and comprises the Late Neogene to Quaternary Karewa sediments formed mainly of clays, loam, silt with thick gravel bands and the Recent alluvium. These Karewa are widely distributed in the Kalarooch-Manchuar Nala valleys & also in the Kandi-Arumpur areas. Both Naugom & Hirpur Formations represent the Karewa Group in Kupwara District. The Hiirpur Formation is

widely exposed in the Nichhahom area. The Karewa either overly the Precambrian-Cambrian or occur as isolated mounds.

Table 1: The general Geological sequence of rock Types as noticed in the District is as given below:

Group	Formation	Age
Karewa Group	Naugom Formation	Late Neogene to Quaternary
	Hirpur Formation	
Panjal Volcanic Group		Carboniferous to Triassic
	Muth Quartzite	Devonian
Pohru Group	Murhama	Silurian-Middle Ordovician
	Trahgam	Lr. Ordovician- Late Middle Cambrian
	Nutunus	Middle Cambrian
	Sagipura/Lolab	Lr. Middle Cambrian – Lr.Cambrian
	Marinag	Early Lower Cambrian – Precambrian
Salkhala	Machhal (Dogra Slate)	Late Neoproterozoic
		Proterozoic

Handwara Tehsil. Middlemiss (1924) estimated lignite reserves at Nichahom to be 80 million tons. The lignite seams showing rapid variation in thickness & quality. Drilling operations were conducted by geology & mining in the Nichahom-Chowkibal areas where the reserves estimated at 4.5 million tons up-to the depth of 38m. This lignite was stated to be poor quality with ash from 25-50%, moisture from 20-35% & calorific value 2200-4500BTU/lb. The lignite seams showing rapid variation in thickness & quality,

6) PROCESS OF DEPOSITION OF SEDIMENTS IN THE RIVERS

Sediment is the solid that has settled down from a state of suspension in a fluid, but in geological usage it includes all solid particles like those derived from pre-existing rocks (clasts), chemical precipitates & organic remains. It is usually observed that like sediments are formed under similar conditions. Sediment is a naturally occurring material that is broken down by processes of weathering and erosion, and is subsequently transported by the action of wind, water, glacial and/or by the force of gravity acting on the particles. The material produced on weathering & erosion are deposited at suitable places as sediments. Sediment includes a variety of material size ranging from clay to big boulders. Sediments are most often transported by water. Sediment is transported based on the strength of the flow that carries it and its own size, volume, density, and shape. Stronger flows will increase the lift and drag on the particle, causing it to rise, while larger or denser particles will be more likely to fall through the flow. If the upwards velocity of the sediment is approximately equal to the settling velocity, sediment will be transported downstream entirely as suspended load. If the upwards velocity is much less than the settling velocity, but still high enough for the sediment to move, it will move along the bed as bed load by rolling, sliding, and saltation (jumping up into the flow, being transported a short distance then settling again). If the upwards velocity is higher than the settling velocity, the sediment will be transported high in the flow as wash load. As there are generally a range of different particle sizes in the flow, it is common for material of different sizes to move through all areas of the flow for given stream conditions. A river deposits its load of sediments as soon as its velocity is checked on the loss of gradient.

7). Details of Royalty or Revenue received in the last three years

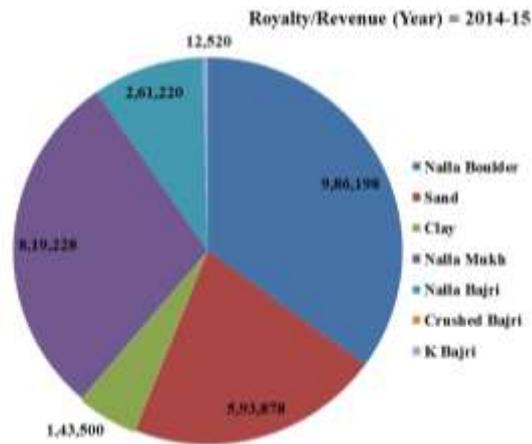


Figure 7: showing revenue collected in 2014-2015

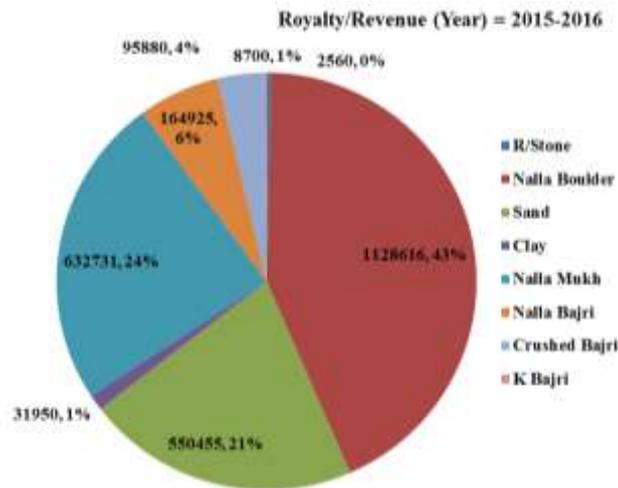


Figure 8: showing revenue collected in 2015-16

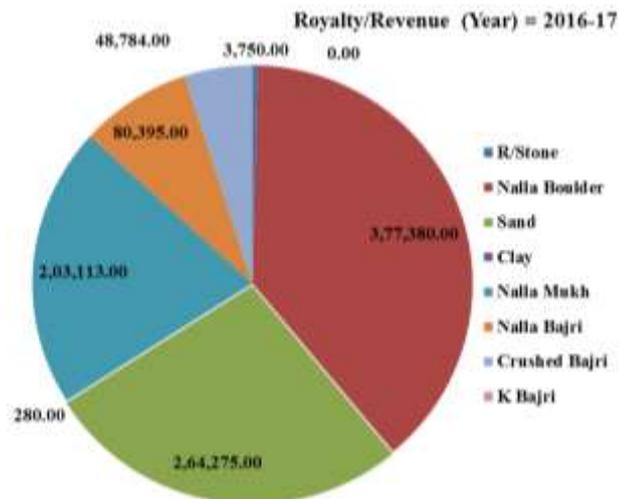


Figure 9: showing revenue collected in 2016-17

8) Details of minor minerals production in the last three years

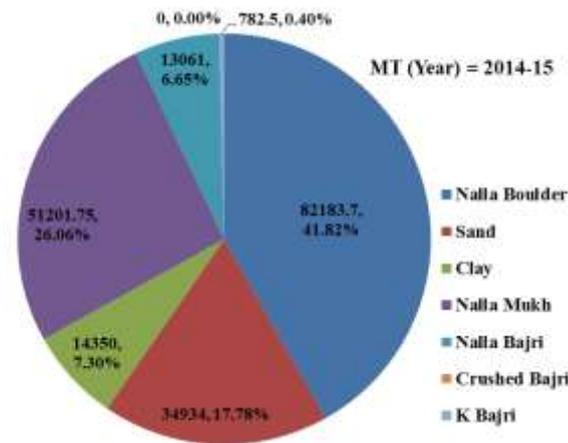


Figure 10: Showing mining of minor mineral in MT year 2014-15

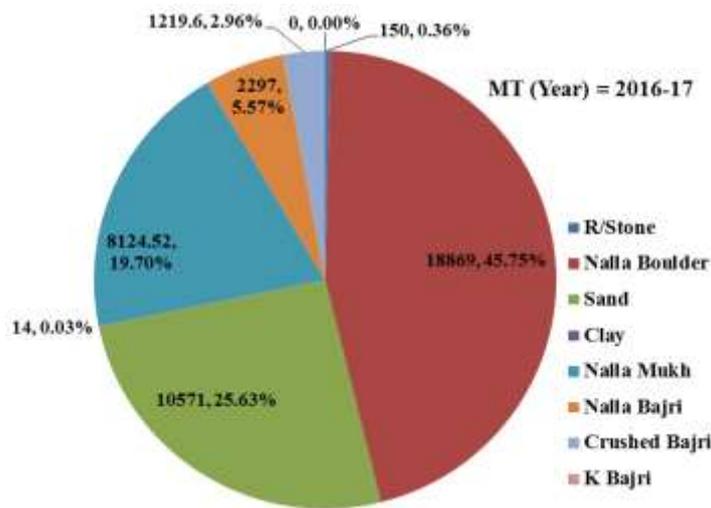


Figure 10: Showing mining of minor mineral in MT year 2016-16

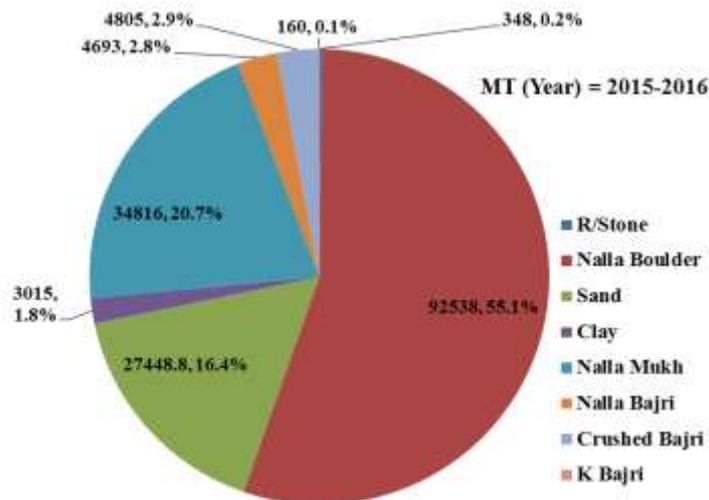


Figure 10: Showing mining of minor mineral in MT year 2015-16

Table 2: Salient features of the main stream in Kupwara district

S. No	Name of the stream	Total Length in the district (Km)	Basin Area (Km²)	Place of Origin	Altitude of Origin (m)
1	Mawar	36.4	265	Bungus	3000
2	Kehmil	40	511	Bungus	3800
3	Lolab	31	350		2800
4	Pohru	33		Stream confluence	