

# **SOCIO ECONOMIC IMPACT STUDY OF MINING AND MINING POLICES ON THE LIVELIHOODS OF LOCAL POPULATION IN THE VINDHYAN REGION OF UTTAR PRADESH**



*Submitted To*

**NITI AAYOG, NEW DELHI**

**2017**

By

**DR. KUMUD DUBEY  
(PROJECT DIRECTOR)**



**CENTRE FOR SOCIAL FORESTRY AND ECO-REHABILITATION**

(INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION, DEHRADUN)

A COUNCIL OF MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, GOVERNMENT OF INDIA, NEW DELHI.

1 | Socio Economic Impact Study of Mining and Mining Polices on the Livelihoods of Local Population in the Vindhyan Region of Uttar Pradesh.2017.  
Dr. Kumud Dubey, Centre for Social Forestry and Eco-Rehabilitation, Allahabad

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*“Indian council of Forestry Research and Education, Dehradun has received the grant under the Research scheme of NITI Aayog, 2015 to produce the document. However, NITI Aayog shall not be held responsible for findings or opinions expressed in the document prepared. The responsibility rests with Indian council of Forestry Research and Education, Dehradun.*

## **Acknowledgements**

I avail this opportunity to express my sincere thanks to NITI Aayog for providing the financial support and opportunity to work as Project Director of the project entitled - “Socio Economic Impact Study of Mining & Mining Policies on Livelihoods of Local Population in Vindhyan Region of U.P.”

I express my sincere gratitude to Shri Jitendra Kumar, Adviser (NRE), NITI Aayog for his valuable co-operation and guidance.

I am grateful to Ms. Pratima Gupta, Director (E&F), NITI Aayog for her suggestions. I express my sincere thanks to Mr. L. Gopinath, SRO (E&F), NITI Aayog for his support and guidance.

I express my sincere thanks to Dr. B. Bishoi, SRO, Socio Economic Research Division, NITI Aayog for his support and guidance. I express my sincere thanks to Dr. Swarnbhuwan (SRO), NITI Aayog for his support and guidance in stake holder meeting.

From the innards of my heart, I express my deep sense of gratitude the Then Working Plan Officer of Mirzapur and Sonbhadra, Shri K. P. Dubey, IFS of UP Forest Department for helping me to clect the required data and supporting me in execution of the project work.

I express my Sincere thanks to DFO Mirzapur Forest Division, DFO, Sonbhadra Forest Division, DFO, Allahabad Forest Division and DFO, Renukoot Forest Division for their help and support in execution of the project work.

I am also thankful to Chief Conservator of Forest, Southern Region, Allahabad and Chief Conservator of Forest, Mirzapur for their support in study.

I express my Sincere thanks to Mining Officer, Mirzapur, Mining Officer, Sonbhadra, Mining Officer Allahabad Districts for their help and support in data collection of the project work.

I express my sincere thanks to leas owner and other stakeholder for expressing their point of views regarding mining policy.

I thank to Director, CSFER, Allahabad CSFER, Allahabad for creating too many hurdles in execution of the project and giving me an opportunity to testify my inner strength to struggle, to tackle and to rise in such adverse conditions. I thank to Director, FRI for motivation.

I also thank to Mr. K. N. Bhatta, G. B. Pant Institute, Allahabad and Mr. G. N. Jha, G. B. Pant Institute, Allahabad for their help in data analysis. I also thank to Mr. Alok pandey and Mr. Praveen Tripathi as team member.

(Dr. Kumud Dubey)

Project Director, CSFER, Allahabad

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## Executive Summary

A study, sponsored by NITI Aayog, New Delhi, entitled as “Socio-economic Impact Study of Mining and Mining Policies on Livelihoods of Local Populations in the Vindhyan Region, Uttar Pradesh” was conducted at Centre for Social Forestry and Eco-Rehabilitation, Allahabad.

Major objectives were to survey of the major mining areas in the Vindhyan Region of Uttar Pradesh, to study the effect of Government Mining Policy on mining in the region and mining activities on the socio-economics of the local people and their dependency on mining for their livelihood sustainability. The effect of mining activities on the vegetation of the region and soil characteristics was also studied. The perceptions of the local people regarding the reclamation of these mining areas after mining closure and their preferential choices for post mining land use were viewed. Based on these final recommendations were prepared for mining policies, rules, regulations, restoration after mining closure, generations of alternative employments.

The Socio-economic study was conducted in mining areas of Allahabad, Mirzapur and Sonabhadra districts of Vindhyan region, UP. in the nearby of mining areas in order to study the existing resources of the area, social-economic structure of the community, employment patterns, income generation activities, dependency on forests, mining, impacts of mining, impact of mining closure on livelihood, preference of land use of mined out areas and species preferred for restoration by the local people along with information on other related environmental and socioeconomic aspects etc. The study has been performed in mining areas by using Participatory Rural Appraisal (PRA) tools and by Questionnaire based Surveys.

Major findings, its conclusion, recommendations and future prospects have been summarized. Most of the local populace were illiterate and had poor awareness regarding the mining rules and policies, their rights and regulations and forestry programmes for development. Major population was wage-labourers and agriculture as a source of occupation had lost its significance because of land acquisition mainly for mining. Major population was landless or marginal and depends on mining for their livelihoods. The mining is the major source of revenue for Government. Family structure was also affected by mining activities mainly of nuclear type. Majority of the respondents accepted the negative impact of mining on adjoining forest,

agriculture and major cause of pollution. Sonbhadra region had been declared as Critically Polluted Area (CPA) by CPCB in the year 2010. From study it was found that mining also have a direct negative impact on health mainly due to air, water and noise pollutions. Majority of respondents depended for their livelihoods on the mining and allied activities. Mining closure has impacted on the livelihoods of respondents. Illegal mining was also a major problem in this area. Majority of respondents wanted the implementation of Land Reclamation and Eco-restoration programmes after closure of mining, whether it would be implemented through lease owner, forest department or any private company, albeit, through involvement of local inhabitants, stakeholders, community organisations and NGOs.

Major recommendations were to educate the people regarding the rules and regulations, their environment, current government programmes, the role of forest, health hazards, requisite precautions and safety measures for human wellbeing, so that they can appreciate and take decisions and necessary precautions for the betterment of their sociological, economic, ecological and environmental needs. Since the livelihoods of majority of people will be affected by the closure of the mining activity, a provision was recommended for alternative employment after the closure of the mining activity. Mining in the area had a significant impact on agriculture and forest environment of the area. To minimize negative effects of dust and particulate matter generated during mining and ancillary activities, provisions for a Buffer zone/Biological Filter Zone at the periphery (at least of 10m width) of mining area was recommended through planting suitable plant species which can absorb/adsorb this dust and particulate matter borne air pollution. Mining also had health hazards. Mining has contributed to the prevalence of respiratory diseases among the mine labourers. To reduce occurrence of respiratory disease, workers working in the mining areas shall be provided with protective respiratory devices like mask, filters etc. Open pits created due to mining should be filled up after mining and mining closure. Medical Camps should be organized by the mine owners for the general medical health check-up of mine workers and surrounding populations. To resolve ownership problems, mining sites should be properly demarcated with proper Signboards carrying all the details of particular mining lease i.e. name of owner, sanction area, mining plan and sanction period etc. Illegal mining had been reported by majority of the people for which frequent vigilant monitoring of the area and by fixing hard punishment for the people getting involved in illegal mining were

recommended. Provisions of eco-restoration of area were recommended through the involvement of local people. Eco-restoration of the mined land will be ensured by the mine owners and provision of strict punishment/penalty should be there in case of failure to adhere to these guidelines. A portion of revenue earned from mining in area should be reserved for the infrastructural development of the area directly. All relevant stakeholders in the mining sector including Forest Department, Environmental Department, Mining Department, District Administration, Mine Owners and Land Owners among others should strengthen collaboration among themselves for effective enforcement and compliance of the mining rules & regulations and implementation of Eco-restoration and other Development Activities post mining closure. A portion of Revenue earned from mining should also be reserved for Research purposes, at the district level, for developing suitable methodology to Eco-restore particular mining sites. Sustained education is required to prevent and control environmental degradation in mining sites. Sanctions and Penalties should also be included in the byelaws such that offenders of the laws will be punished accordingly. Forest Department, Environmental Department, Mining Department, District Administration can play leading roles in the facilitation process.

For Future Research Works, similar studies were proposed for Districts of Bundelkhand Region. Results obtained from these would then be more representative as far as mining in Uttar Pradesh is concerned. This would also give a broader picture of the problem so as to ensure that a more holistic approach is adopted to amend the mining policies. Further research would also be required to assess mining impacts on below-ground biomass in the district.

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## Introduction

Mineral deposits are assets that can be used beneficially for the mankind. Minerals' forming deposits are regarded as non-renewable resources and are used by man for (a) material (b) sustenance of life and (c) energy requirements. The mining and quarrying of rocks and minerals is an age-old economic activity, though its nature and form have been changing over passage of time in many ways and means. The dependence of primitive societies upon mined products is illustrated by the nomenclature of those epochs: Stone Age, Bronze Age and Iron Age, a sequence which also shows the increasing complexity of society's relationship with mining. In a sense, the history of mining is the history of civilization (Khoshoo, 1991).

Mining is considered as one of the necessary evils of the modern world, which provides the materials required to sustain quality of life. While improving the quality of life and giving an impetus to economic development, it has also brought in its wake, a notable impact on the environment as well as socio-economic conditions of local people (Vaghlikar and Moghe, 2003).

Uttar Pradesh is endowed with natural wealth in abundance. This rich wealth lies hidden below a variety of rocks of different ages found in lofty mountain ranges of the Himalayas in the North and the Vindhyan ranges in the South. The diversity of flora and fauna displayed here due to vast area, big and small rivers, varieties of climatic conditions and different kinds of soil are hard to find elsewhere. Uttar Pradesh is not a highly mineralized state. Yet, certain regions such as the Vindhyan and the Bundelkhand, are the areas where significant mineralization has taken place. Mineral based industries are the major contributors to the overall economy of these regions. Important minerals include coal, diaspore, sulphur, magnesite, pyrophyllite, silica sand and limestone etc. Several industries using these minerals are already in operation, including fertilizers, aluminium, alumina, caustic soda, ferro-alloys, refractory and ceramics, sulphuric acid and oil refinery. In addition, a few other minerals are also found in the State. These include marble in Mirzapur and Sonbhadra, non-plastic fireclay in Bansi and Makri-Khoh area of Mirzapur district and Uranium found in the Lalitpur district. Barytes and Edalusites are found in the Mirzapur and Sonbhadra districts. Reserves of sandstone, pebbles, reh, salt punter, morang, sand and other minor minerals are also found present in the State.



Developing regions with large mineral deposits confront a challenge in striking the right balance between exploiting the mineral resources for economic prosperity and safeguarding environmental stability and socioeconomic welfare. The state of Uttar Pradesh in India, faces this challenge as it embarks upon a major reform program with the mining sector taking center stage in the growth process. Most of Uttar Pradesh's mineral deposits are in forests that are inhabited by tribal populations and harbor rich biodiversity. Mineral extraction, therefore, has disproportionately affected forest ecosystems and the surrounding environment and consequentially, the tribals as well as the forest dwelling populations too. However, the mining and mineral sectors are perceived to have failed to alleviate poverty for these vulnerable populations around the forest areas. Thus, the impacts of mining and mines upon natural ecosystems, biodiversity and tribal livelihoods have become a key environmental concern and source of conflict and socioeconomic tension in Uttar Pradesh. In the Vidhyan Hills, mining is denuding hills, leading to depletion of invaluable forests and precious water sources. This, in turn, has affected livelihoods of thousands of common people of the area. It has also started threatening the productivity of local farmlands, both qualitatively as well as quantitatively and thus, it can have serious enduring consequences on the neighbourhood socio-economic situation. The socio-economic impact of mining, in general, on the local populations in Vidhyan region has not been studied systematically so far. In Uttar Pradesh, the State Government believes that the vast mineral reserves offer vast potential, not only for overall economic growth but also for creating local employment opportunities. Accordingly, plans are being developed to expand mining output three folds within the next few years. The proposed mining plans have been severely criticized by environmentalists and social activists, concerned about the potential loss of forests and displacement of villages as the mines increase in number and size of operations. This concern extends to private investors, as found in a recent Climate Investment Survey for Uttar Pradesh. Political unrest between villagers and the State over the issue of displacement has increased recently. Insufficient attention to managing impacts on the environment and the socioeconomic fabric observed in the past, has reflected adversely on public support for reform and private investment needed for accelerating growth in the State.

The present proposed study is helpful to solve these all important inter linked complex socioeconomic and environmental issues. Therefore, the present study has been planned to study

the impacts of mining on the prevailing socioeconomic situation of the local people. The results obtained from the present study shall be helpful to devise multiple steps and measures to minimize the harmful effects of mining on the local environment, forest and the health of local people and on livelihood too, by improvisation of scientific mining and by undertaking several proven environmental and pollution control measures, to decide upon the extension of mining leases, to modify the mining policies in order to discourage illegal mining, to endorse the alternative sources for local livelihoods, to reclaim the mining area after closure of mines and to decide upon its future environmentally suitable and economically efficacious land use etc.

### **Mining:**

Mining is the extraction of valuable minerals or other geological materials from the earth, from an ore body, vein or seam. The term also includes the removal of soil. Materials recovered by mining include base metals, precious metals, iron, uranium, coal, diamonds, limestone, oil shale, rock salt and potash. Mining in a wider sense comprises extraction of any non-renewable resource (e.g., petroleum, natural gas, soil or even water) (Langer, 1988). Mining of stone and metal has been done since pre-historic times. Modern and organized mining processes involve prospecting for ore bodies, analysis of the profit potential of a proposed mine, extraction of the desired materials and finally reclamation of the land to prepare it for other uses once the mine is closed (Langer, 1988).

Mining can be grouped into several types depending on the purpose and extent of mining. This may include stone mining, sand mining, gravel mining, base metal mining and precious metal mining which include gold, iron, uranium, coal, diamonds, limestone, oil shale, rock, salt and potash mining (Langer, 1988). He also classified mining into surface mining (usually associated with gravel, sand and sometimes mineral), deep mining (mostly associated with pure mineral), in-stream mining (mostly for sand, petroleum etc.) and upland mining (mostly gravel, stone etc.) depending on their locations.

### **Mining in India:**

The Indian sub-continent, because of its gigantic size and varied geological structure, is replete with rich deposits of industrially important minerals. The term “minerals” encompasses a wide variety of substances taken from the earth. They are generally divided into four groups: metals, such as aluminium, copper, iron etc.; industrial minerals, such as silica, limestone,

dolomite, magnesite etc.; construction materials such as sand, gravel and grit etc.; and energy minerals (fuel minerals) such as coal, lignite, oil and natural gas. India is endowed with significant mineral resources. India produces 89 minerals out of which 4 are fuel minerals, 11 are metallic, 52 are non-metallic and 22 are minor minerals (together with building and other materials) (Vaghlikar and Moghe, 2003). India is among the top ten mineral producing nations in the world and its economy depends on the value of minerals produced (Ghosh, 2003). It is the world's largest producer of mica blocks and mica splitting. With the recent spurt in world demand for chromite, India has stepped up its production to become the third highest among the chromite producers of the world. Besides, India ranks third (3rd) in production of coal, lignite and barytes, fourth (4th) in iron ore, sixth (6th) in bauxite and manganese ore, tenth (10th) in aluminum and eleventh (11th) in crude steel in the World (Vaghlikar and Moghe, 2003, Annon, 2001, Annon, 2013).

Soon after independence, India witnessed a spurt in the growth of heavy industries that needed a large amount of mining of minerals. Thus, the mining operations in India began on a large scale in 1950s (Valdiya, 1988). The aggregate mineral production in 1999- 2000 was about 550 million tonnes contributed by over 3,100 mines (reported mines) producing coal, lignite, limestone, iron ore, bauxite, copper, lead, zinc etc. The aggregate value of the mineral production in 1999-2000 was more than Rs. 452.3 billion. The value of mineral production during 1999-2000 was estimated at Rs.452.3 billion to which contribution from public sector was Rs.378.4 billion (84%). In the total value of mineral production, fuel minerals accounted for Rs.372.3 billion (82%), metallic minerals for Rs.34.2 billion (8%), nonmetallic minerals for Rs.18.3 billion (4%) and minor minerals for Rs.27.6 billion (6%). Around 9,244 mining leases are spread over 21 States occupying about 0.7 million hectares which is 0.21% of the total geographic area of the country. Out of 9,244 mining leases, 639 (7%) leases were in the public sector and the remaining balance in the private sector. The following ten states together account for 93% of the total leases granted: Gujarat (15%), Rajasthan (14.5%), Andhra Pradesh (14%), Madhya Pradesh (13.5%), Karnataka (11%), Tamil Nadu (7%), Orissa (6.5%), Bihar (4.7%), Goa (4.3%) and Maharashtra (2.4%) (T E R I, 2001; Vaghlikar and Moghe, 2003). More than eighty four per cent (84%) of the mineral production comes from open cast mines and therefore, one must add the quantity of overburden to that of the mineral production in order to assess the total amount of

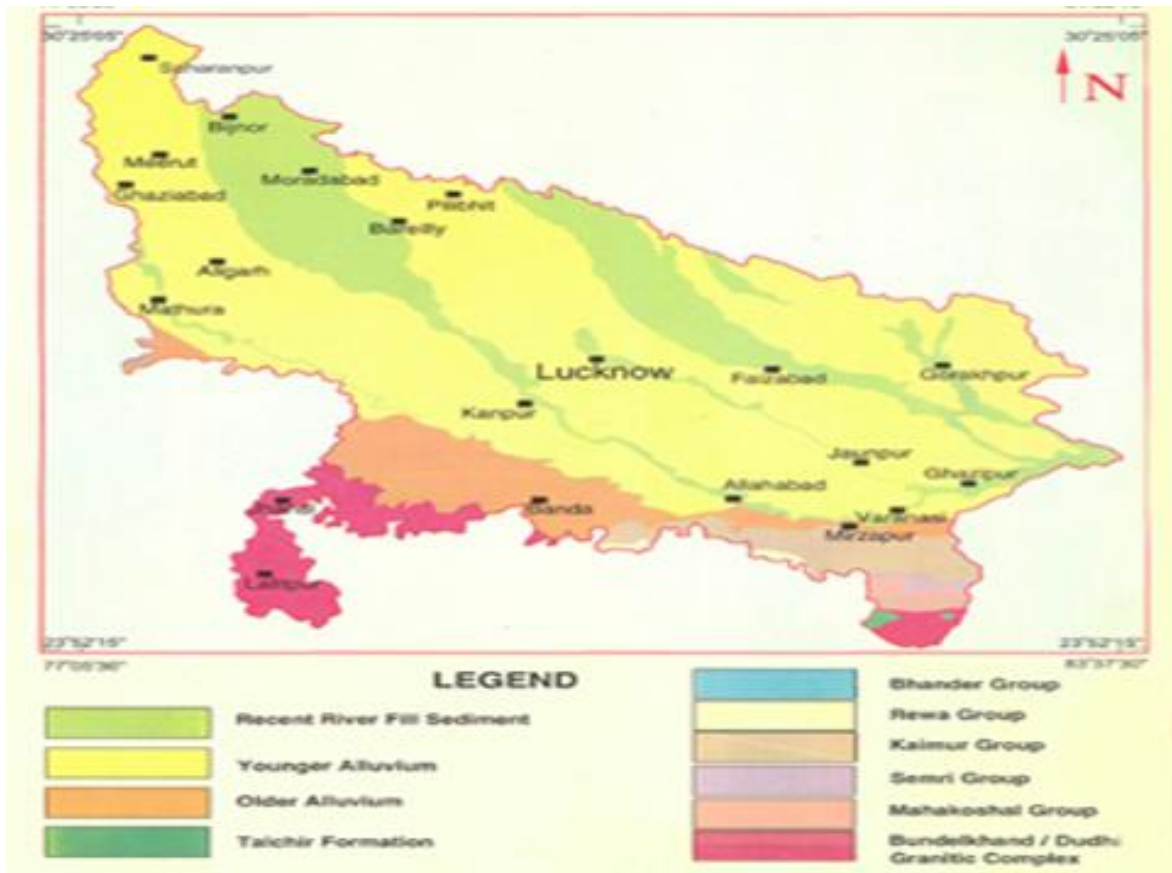
annual excavation in India's mining sector. Small-scale mining is more prevalent in India. The minor mineral sector (19 minerals in all) does not usually get that much attention as regards its environmental impacts because of the often small lease sizes and smaller scale of operation (TERI, 2001). It is important to note that of the non-fuel minerals, 'stone, sand and gravel', all falling within the minor minerals in India, are produced most widely and in the largest quantities worldwide. But this sector has the largest number of leases spread across the country and has significant environmental impacts (Vagholikar and Moghe, 2003).

Depending upon the location of mineral ores, mining can be divided into two broad types, viz., open cast or surface mining and underground mining. The surface mining, which is also known as open cast mining or quarrying, is easier. Open cast or surface mining includes area strip, contour strip and mountain-top removal. The surface mining is, in general, an activity that can provoke a quite intense environmental degradation, which tends to a strong disturbing effect in the landscape because it requires the removal of the vegetation, soil and rocks that are above the mineral deposits. Thus, it demands a constant concern in the sense associating it to a program of recovery of the area. At present about eighty four per cent (84%) of all mines and ninety nine per cent (99%) of non-metallic mines are surface mines (TERI, 2001). The mode of occurrence and the nature of the ore determine the method of extraction. Sedimentary or bedded ores lying close to the surface are called open cast mines. Underground mining, in contrast to the open cast mining, is inherently risky. Poisonous gases, fires, floods and caving lead to fatal accidents. In this kind of mining, vertical or inclined shafts and horizontal tunnels are made and connected with underground galleries. Rocks are extracted and transported to surface through these passages. It requires specially designed lifts, drills, haulage vehicles and ventilation system for safe and efficient movement of people and materials.

### **Geology and Mining in Uttar Pradesh:**

The State of Uttar Pradesh comprises an area of about 2,40,928 sq. km & forms one of the largest states in the country. It extends from latitude 23°05'15" N : 30°25'05" N & longitude 77°05'36" E : 84°03'10" E. Uttar Pradesh is endowed with natural wealth in abundance (Fig. 1). The State of Uttar Pradesh has a Long and Interesting history of Mining of Minerals. This rich wealth lies hidden below a variety of rocks of different ages found in lofty mountain ranges of the Vindhyan ranges in the South and Bundelkhand region. It is characterized by rock

formations ranging in age from the Archean (the Bundelkhand & Granitic gneisses) to the Recent (the Ganga alluvium). It is filled with recent alluvial sediments which is at places more than 1,000 m. thick & an amalgam of Sand, silt, clay in varying proportions. The southern hilly tract is roughly parallel to the Ganga-Yamuna lineament. The tract is underlain by granitic complex in Bundelkh& region & in Sonbhadra. It is overlain by rocks Mahakoshal (Bijawar) & Vindhyan Supergroup. The younger rock comprise of coal bearing Gondwana in south Sonbhadra & basaltic rocks in southern part of Lalitpur. The lower Vindhyan sediments of Sonbhadra contain deposits of cement grade limestone, flux grade dolomits, building stone & coal. While the Upper Vindhyan Sandstones are suitable for making slab/tiles. Deposits of silica Sands are available in Allahabad & chitrakoot districts while coal deposits occur in the Gondwana rocks in southwestern corner of Sonbhadra.



**Figure 1:** Geological Map of Uttar Pradesh.

The diversity of flora and fauna displayed here due to vast area, big and small rivers, varieties of climatic conditions and different kinds of soil are hard to find elsewhere. Uttar Pradesh is not a highly mineralized state. Yet, certain regions such as the Vindhyan and the Bundelkhand, are the areas where significant mineralization has taken place. Mineral based industries are the major contributors to the overall economy of these regions. Important minerals include coal, diaspore, sulphur, magnesite, pyrophyllite, silica sand and limestone etc. Several industries using these minerals are already in operation, including fertilizers, aluminium, alumina, caustic soda, ferro-alloys, refractory and ceramics, sulphuric acid and oil refinery. In addition, a few other minerals are also found in the State. These include marble in Mirzapur and Sonbhadra, non-plastic fireclay in Bansi and Makri-Khoh area of Mirzapur district and Uranium found in the Lalitpur district. Barytes and Edalusites are found in the Mirzapur and Sonbhadra districts (Table 1).

**Table 1: Mineral Production in Uttar Pradesh, 2010-11 to 2012-13**

Mineral	Unit	2010-11			2011-12			2012-13		
		No. of mine	Qty	Value (in L,000)	No. of mine	Qty	Value (in L,000)	No. of mine	Qty	Value (in L,000)
All Minerals		24		47781553	23		66928948	21		76242649
Coal	'000t	5	15526	15122300	4	16178	34369500	4	16090	35844200
Diaspore	t	*	14917	22752	*	11725	16859	*	8755	140699
Limestone/Dolomite	'000t	1	3312	500514	1	3330	432928	2	3304	445122
Pyrophyllite	t	10	31076	8810	13	29336	6999	13	31186	8787
Silica Sand	t	8	167109	36486	5	58596	11971	2	42051	8322
Sulphur#	t	-	38856	-	-	36005	-	-	43573	-
Minor Minerals@		-	-	32090691	-	-	32090691	-	-	39922149

From Indian Minerals Yearbook-2013 # Recovered as by-product from oil refinery.

Reserves of sandstone, pebbles, reh, salt punter, morang, sand and other minor minerals are also found present in the State. The activities in the traditional building stone industry also

increased considerably. Through the continuous efforts of the exploration Geologists, mineral deposits like Soapstone, Diaspore, Pyrophyllite, Bauxite, Rock Phosphate, high grade limestone and Cement grade Limestone, Dolomite, Coal etc. could be evaluated and a vast potential for their expansion established. Mineral Production in Uttar Pradesh from year 2010-11 to 2012-13 has been depicted in Table 1. Vindhyan Sand Stone as building and Mill Stone were also mined in the districts of Allahabad, Mirzapur and Sonbhadra. The Silica Sand deposits near Shankargarh in Allahabad were mined to meet the increasing demand of the Glass and Foundry Industries.

### **Mining Policy:**

Mining is the second biggest sector after agriculture and contributes 2.4 per cent in GDP. It creates huge job opportunities and if the sector is promoted, there would be ample job opportunities and GDP will grow. Management of mineral resources is the responsibility of both the Central Government and the State Governments in terms of Entry 54 of the Union List (List I) and Entry 23 of the State List (List II) of the Seventh Schedule of the Constitution of India.

The Mines and Minerals (Development and Regulation) Act (MMDR Act), 1957 lays down the legal frame-work for the regulation of mines and development of all minerals other than petroleum and natural gas. The Central Government has framed the Mineral Concession Rules, 1960 (MCR) for regulating grant of reconnaissance permits (RP), prospecting licences (PL) and mining leases (ML) in respect of all minerals other than atomic minerals and minor minerals. The State Governments have framed the rules in regard to minor minerals. The Central Government have also framed the Mineral Conservation and Development Rules (MCDR), 1988 for conservation and systematic development of minerals. These are applicable to all minerals except coal, atomic minerals and minor minerals.

Mining Policy followed by the state and its legal & admin aspects hve been explicated in following section (source official website of Directorate of Geology & Mining, Uttar Pradesh).

### **Central Regulation:**

- The major mineral lease is granted under central Mines & Minerals (development & regulation) act 1957 & Mineral Concession rules 1960.

- Application for Reconnaissance permit; Prospecting license & Mining lease shall be furnished in for A,B, & I forms respectively.
- These forms are available in mineral concession rules 1960 & are to be submitted to the District Magistrate office of the concerned district.
- The prospecting license, reconnaissance permit & mining lease is sanctioned by the state Government on the technical report of the directorate & the report of district magistrate regarding status of the Land.

### **State Rules**

- The Minor Mineral lease is granted under UP Minor Mineral Concession Rules 1963.
- The lease is sanctioned by the District Magistrate of the concerned district except limestone marble & dimensional granite which is sanctioned by the state government.
- The application is submitted to the concerned DM office & forms are available in the UP Minor Mineral Concession Rules 1963.
- Provisions for small areas, & one man one lease have been made.

### **State Mineral Policy 1998:**

Salient features of the policy are as below:

- The lease is sanctioned within 60 days.
- Priority to the technically sound entrepreneurs
- Approach roads in mineral areas and participation in providing infrastructure facility.
- Status of Industry to mining & mineral development activity and concession in trade tax.
- Financial assistance to mineral development
- Development of mineral estates

### **GRANTS OF RECONNAISSANCE PERMITS:**

Procedure and application for reconnaissance permit is given below:-

**(1)** An application for reconnaissance permit shall be made to the State Government in Form 'A' through such officer or authority as the State Government may specify in this behalf.



**(2) (a)** Every such application shall be accompanied by a non-refundable fee calculated at the rate of five rupees per square kilometre.

**(b)** A valid clearance certificate, in the form prescribed by the State Government for payment of mining dues, such as royalty or dead rent or surface rent payable under the Act or rules made there under, from that Government or any officer or authority authorised by that Government in this behalf.

- Provided that where a person has furnished an affidavit to the satisfaction of the State Government stating that he does not hold (and has not held) reconnaissance permit, it shall not necessary for him to produce the said valid clearance certificate.
- Provided that an affidavit stating that no dues are outstanding shall suffice subject to the condition that the certificate required as above shall be furnished within ninety days of the date of application and the application shall become invalid if the party fails to file the certificate within the said ninety days.
- Provided also that where any injunction has been issued by a court of law or any other competent authority staying the recovery of any such mining dues or income tax, non-payment there of shall not be treated as a disqualification purpose of granting the reconnaissance permit
- Provided further that in case the applicant is a partnership firm or a private limited company, such certificate shall be furnished by all persons of the partnership firm or, as the case may be, all members of the private limited company.

**(c)** An affidavit stating that the applicant has :

- (i)** Filed up-to-date income-tax returns;
- (ii)** Paid the income-tax assessed on him; and
- (iii)** Paid the income tax on the basis of his assessment as provided in the Income Tax Act, 1961 (43 of 1961) .

**(d)** An affidavit showing the particulars of areas, mineral-wise, in the State, which the applicant or any person jointly with him :

- (i)** already holds under a reconnaissance permit;
- (ii)** has applied for but not granted; and
- (iii)** being applied for simultaneously.

**4A.** Acknowledgement of application :-

(1) Where an application for the grant of reconnaissance permit is delivered personally, its receipt shall be acknowledged forthwith.

(2) Where such application is received by registered post, its receipt shall be acknowledged on the same day.

(3) In any other case, the receipt of such application shall be acknowledged within three days of the receipt.

(4) The receipt of every such application shall be acknowledged in Form 'D-1'.

(5) Refusal of application for a reconnaissance permit :

- The State Government may after giving an opportunity of being heard and for reasons to be recorded in writing and communicated to the applicant, refuse to grant a reconnaissance permit over the whole or part of the area applied for.
- Where it appears that the application is not complete in all material particulars or is not accompanied by the required documents, the State Government shall, by notice, require the applicant to supply the omission or, as the case may be, furnish the documents without delay and in any case not later than thirty days from the date of receipt of the said notice by the applicant.

(6). Status of grant on death of the applicant for reconnaissance permit :

- Where an applicant for the grant of reconnaissance permit dies before the order granting him a reconnaissance permit is passed, the application for the grant of reconnaissance permit shall be deemed to have been made by his legal representatives.
- In the case of an applicant in respect of whom an order granting a reconnaissance permit is passed but who dies before the deed referred in sub-rule (1) of rule 7A is executed, the order shall be deemed to have been passed in the name of the legal representative of the deceased.

**(7) Condition of a reconnaissance permit** :- (I) Every reconnaissance permit granted under these rules, shall, in addition to any other conditions that may be specified therein be subject to the following conditions namely:

(i) The holder of reconnaissance permit shall progressively relinquish the area granted under the permit as follows:

- After completion of two years, the area shall be reduced to one thousand square kilometers or fifty percent of the area granted, whichever is less; and
- The area would be further relinquished so that the permittee is left with an area not more than twenty five square kilometres at the end of third year.

(ii) The holder of the reconnaissance permit shall strictly adhere to the minimum expenditure commitment and specific physical targets specified in the order of grant of the permit failing which reconnaissance permit may be cancelled.

(iii) The holder of reconnaissance permit shall make available all data collected by him during the reconnaissance operations to the Geological Survey of India, Indian Bureau of

Mines and the State Government which may be made available to any prospecting investor after a minimum period of two years of the completion of the period of reconnaissance permit.

(iv) The holder of reconnaissance permit shall not enter any forest land or any private land without obtaining permission of the Forest Department or the owner of the private land, as the case may be.

(v) The holder of reconnaissance permit shall maintain accurate faithful account of all the expenses incurred by him on the reconnaissance operations.

(vi) The holder of reconnaissance permit shall submit to the State Government a six monthly report of the work done by him and the valuable data collected by him during the period. The report shall be submitted within 3 months of the close of the period to which it relates.

(vii) The permit holder shall also submit to the State Government within three months of the expiry of the permit, or abandonment of operations or termination of the permit whichever is earlier, a full report of the work done by him and all information relevant to mineral resources acquired by him in the course of reconnaissance permit in the area covered by the permit.

(viii) While submitting reports sub clause (vi) or (vii), the permit holder may specify that the whole or any part of the report or data submitted by him shall be kept confidential; and the State Government shall thereupon, keep the specified portions as confidential for a period of two years from the expiry of the permit, or abandonment of operations or termination of the permit, whichever is earlier.

(ix) The permit holder shall allow every officer authorised by the Central Government or the State Government in this behalf to examine at any time accounts maintained and furnish the Central Government or the State Government or any other officer authorised by it in that behalf such information and returns.

(x) The permit holder shall allow officer authorised by the Central Government or the State Government in this behalf to inspect any reconnaissance operations carried on by him.

(xi) The permit holder shall pay such permit fee as may be fixed by the State Government, being not less than five rupees per square kilometre and not more than twenty rupees per square kilometre of land held by the permit holder for each year or part there of.

(II) The reconnaissance permit may contain such other conditions as may be imposed by the Central Government which inter-alia may include the condition that the representative of the Directorate General, Civil Aviation or Ministry of Defence shall be present during the aerial surveys.

(III) The State Government may, with the approval of the Central Government, impose such further conditions in the permit as it may think necessary in the interest of mineral development and for compliance of various legal provisions.

(IV) In case of breach of any condition imposed on any holder of reconnaissance permit by or under this rule, the State Government may be order in writing, cancel the permit, and/or forfeit in whole or in part, the amount deposited by the permit holder as security.

- Provided that no such order shall be made without giving the permit holder a reasonable opportunity of stating his case.

**7A. Reconnaissance Permit to be executed within three months :-**

- Where, on any application for a reconnaissance permit, an order has been made for the grant of such permit, a deed granting such permit shall be executed within 90 days of the date of the communication of the order or such further period as the State Government may allow in this behalf, and if no such deed is executed within such period due to any fault on the part of the applicant, the State Government may revoke the order, granting the reconnaissance permit and in that event the fee paid shall be forfeited to the State Government.
- The deed referred to in sub rule 1 shall be in Form F-1 or in a Form as near there to as circumstances of each case may require.
- The date of the commencement of the period for which a reconnaissance permit is granted shall be the date on which the deed is executed after all necessary clearance have been obtained.

**7B. Security deposit :-**

- An applicant for a reconnaissance permit shall before deed referred to in sub-rule 7A is executed, deposit as security for the observance of the terms and conditions of the permit a sum of twenty rupees in respect of every square kilometre or part thereof for which the permit is granted.
- Any deposit made under sub-clause (i) above if not forfeited under the rules shall be refunded to the applicant as soon as the report referred to in sub-rule (1) (vii) of rule 7 is submitted.

**8. Applicability of Chapter II, Chapter III and Chapter IV :-** The provisions of Chapter II, Chapter III and Chapter IV shall apply to the grant of reconnaissance permits as well as grant and renewal of prospecting licences and mining leases only in respect of the land in which the minerals vest in the Government of a State.

**9. Application for prospecting licence and its renewal :**

I. An application for a prospecting licence and its renewal in respect of land in which the minerals vest in Government shall be made to the State Government in Form B and Form E respectively through such officer or authority as the State Government may specify in this behalf.

II. Every such application shall be accompanied by –

(a) a [non-refundable] fee calculated in accordance with the provisions of Schedule II;

(b) A valid clearance certificate in the form prescribed by the State Government, of payment of mining dues, such as royalty or dead rent and surface rent payable under the Act or the rules made there under, from that Government or any officer or authority by that Government in this behalf; Provided [omitted] that in case the applicant is a partnership firm or a private limited company such certificate shall be furnished by all partners of the partnership firm or, as the case may be, all members of the private limited company.

- Provided further that where any injunction has been issued by court of law or any other competent authority staying the recovery of any such mining dues or income tax, non-payment there of shall not be treated as a disqualification for the purpose & granting or renewing the said prospecting licence;
- Provided that where a person has furnished an affidavit to the satisfaction of the State Government stating that he does not hold and has not held a prospecting licence, it shall not be necessary for him to produce the said valid clearance certificate;
- Provided further that a sworn affidavit stating that no dues are outstanding shall suffice subject to the condition that the certificate required as above shall become invalid if the party fails to file the said certificate within ninety days.]

(c) an affidavit stating that the applicant has –

i) filed up-to-date income tax return;

ii) paid the income tax assessed on him, and

iii) paid the income tax on the basis of self-assessment as provided in the Income Tax Act,1961;

(d) An affidavit showing particulars of areas mineral-wise in [the] state, which the applicant or any person jointly with him –

i) already holds under a prospecting licence;

ii) has applied for but not granted; and  
iii) being applied for simultaneously.

(g) A statement in writing that the applicant, where the land is not owned by him, has obtained surface rights over the area or has obtained the consent of the owner for starting prospecting operations :

- Provided that no such statement shall be necessary where the land is owned by the Government.
- Provided [omitted] that the consent of the owner for starting prospecting operations in the area or part thereof may be furnished after execution of the prospecting licence but before entry into the said area.
- Provided further that no further consent would be required in the case of renewal where consent has already been obtained during grant of the licence.  
[omitted]

III. The State Government may, for reasons to be recorded in writing, relax the provisions of clause (d) of sub-rule (2) of rule 9.

IV. The grant of a clearance certificate under clause (d) of sub-rule (2) of rule 9 shall not discharge the holder of such certificate from the liability to pay the mining dues which may subsequently be found to be payable by him under the Act or the rules made there under.

10. Acknowledgement of application : -

(I) where an application for the grant of renewal of a prospecting licence is delivered personally, its receipt shall be acknowledged forthwith.

(II) Where such application is received by registered post, its receipt shall be acknowledged on the same day.

(III) In any other case, the receipt of such application shall be acknowledged within three days of the receipt.

(IV) The receipt of every such application shall be acknowledged in Form D.

11. Disposal of application for the grant and renewal of prospecting licence :

(I) (a) An application for the renewal of a prospecting licence shall be made at least ninety days before the expiry of the prospecting licence and shall be accompanied by –

- (i) a statement relating to the prospecting operations already undertaken by the applicant;
- (ii) the amount of expenditure incurred;
- (iii) the numbers of hours and days for which the work was undertaken; and
- (iv) the period which is required to complete the prospecting work.

**(I) (b)** An application for the renewal for a prospecting licence shall be disposed of by the State Government before the expiry of the period of prospecting licence and if the application is not disposed of within that period, the licence shall be deemed to have been renewed for a period not exceeding the period prescribed for renewal of prospecting licence under sub-section (2) of section 7 of the Act or the period for which an application is made, whichever is less.

**(II)** The State Government may, for reasons to be recorded in writing and communicated to the applicant, at the time of renewal, reduce the area applied for.

**(III)** The State Government may condone delay in submission of an application for renewal of a prospecting licence made after the time limit prescribed in sub-rule (2) provided the application for the renewal has been made before the expiry of the licence.

**12. Refusal of application for a prospecting licence :-** (1) The State Government may, after giving an opportunity of being heard and for reasons to be recorded in writing and communicated to the applicant, refuse to grant or renew a prospecting licence over the whole or part of the area applied for.

**(1A)** An application for the grant or renewal of a prospecting licence made under the rule 9 shall not be refused by the State Government only on the ground that Form B or Form E, as the case may be, is not complete in all material particulars or is not accompanied by the documents referred to in clauses (d), (e), (f) and (g) of sub-rule (2) of the said rule.

**(1B)** Where it appears that the application is not complete in all material particulars or is not accompanied by the required documents, the State Government shall, by notice, require the applicant to supply the omission or, as the case may be, furnish the documents without delay and in any case not later than thirty days from the date of receipt of the said notice by the applicant.

(2) An application for the grant of a prospecting licence shall not be refused on the ground only that, in the opinion of the State Government, a mining lease should be granted for the area for which the application for a prospecting licence has been made: Provided that where applications for the grant of prospecting licence and applications for the grant of mining lease in respect of the same area are received on the same date or on different dates within a period of thirty days, the applications for the grant of mining lease shall, if the area was previously held and worked under a mining lease, be disposed of before the applications for the grant of prospecting licence are considered. Provided further than the application received for grant of prospecting licence shall be liable to be considered only if they have not been already disposed of.

**13. Status of grant on death of the applicant for prospecting license:**

- Where an applicant for the grant of prospecting licence dies before the order granting him a prospecting licence is passed, the application for the grant of prospecting licence shall be deemed to have been made by his legal representative.
- In the case of an applicant in respect of whom an order granting a prospecting licence is passed but who dies before the deed referred to in sub-rule (1) of rule 15 is executed, the order shall be deemed to have been passed in the name of the legal representative of the deceased.

**14. Conditions of a prospecting licence:-**

**(I)** Every prospecting licence granted under these rules, shall, in additions to any other conditions that may be specified therein, be subject to the following conditions, namely:-

**(i)** the licence shall pay such prospecting fee as may be fixed by the State Government, being not less than fifty paise and not more than five rupees per hectare of land covered by the licence for each year or part of a year of the period for which the licence is granted or renewed;

**(ii)** the licence may win and carry for purposes other than commercial purposes –

**(a)** any quantity of such minerals within the limits specified under column 3 of Schedule III without any payment;

**(b)** any quantity of such minerals not exceeding the limits specified under column 4 of Schedule III, on payment of royalty for the time being specified in the Second Schedule to the Act in respect to those minerals :

Provided that if any quantity in excess of the quantities specified in sub-clause (b) is won and carried away, the State Government may recover the cost of the excess



quantity of minerals won and carried away.

**(iii)** with the written approval of the State Government, the licensee may carry away quantities of minerals in excess of the limits specified in Schedule III, on payment of royalty for the time being specified in the Second Schedule to the Act, for chemical, metallurgical, ore-dressing and other test purposes.

**(iv)** save in the case of land in respect of which the licensee is granted a mining lease, he shall, within six months next after the determination of the licence or the date of abandonment of the prospecting operations, whichever is earlier, securely plug all bores and fill up or fence all excavations in the land covered by the licence;

**(v)** the licensee shall report to the State Government the discovery of any mineral not specified in the licence within a period of sixty days from the date of such discovery. Consequent upon such reporting, such newly discovered mineral shall be deemed to have been included in the prospecting licence;

**(vi)** the licensee shall not except with the previous sanction of the State Government transfer his licence; [Provided that no prospecting licence shall be transferred to any person who has not filed an affidavit stating that he has filed an up-to-date income-tax returns and paid the income-tax assessed on him and paid the income tax on the basis of self-assessment as provided in the Income Tax Act, 1961 (43 of 196) and except on payment to the State Government of a fee of five hundred rupees].

**(vii)** the licensee shall not pay a wage less than the minimum wage prescribed by the Central or the State Government from time to time under the Minimum Wages Act, 1948;

**(viii)** the licensee shall observe the provisions of the Mines Act, 1952 [(35 of 1952) and the provisions of the Atomic Energy Act, 1962 (33 of 1962) in so far as the latter relate to atomic minerals included in Part-'B' of the First Schedule to the Act].

**(ix)** the licensee shall -

(a) take immediate measures for the planting in the same area of any other area selected by the Central or the State Government not less than twice the number of trees destroyed by reasons of any prospecting operations;

(b) look after them during subsistence of the licence after which these shall be handed over to the State Forest Department or any other authority as may be nominated by the Central or State Government'

(c) restore, to the extent possible, other flora destroyed by prospecting operations.

(xi) the licensee shall pay to the occupier of surface of the land such compensation as may become payable under these rules :

(xii) the licensee shall comply with the Mineral Conservation and Development Rules framed under section 18.

(II) A prospecting licence may contain such other conditions relating to the following as the State Government may think fit to impose, namely :-

- (i) compensation for damage to land respect of which the licence has been granted;
- (ii) indemnity to Government against the claim of a third party for any damage, injury or disturbance caused to him by the licensee;
- (iii) restrictions regarding felling of trees on unoccupied and unreserved Government land;
- (iv) restrictions on prospecting operations in any area prohibited by any competent authority;
- (v) operations in a reserved or protected forest;
- (vi) conditions regarding entry on occupied land;
- (vii) facilities to be given by the licensee for working other minerals in the licenced area or adjacent areas;
- (viii) filing of civil suits or petitions relating to disputes arising out of the area under prospecting licence.

(III) The State Government may, either with the previous approval of the Central Government or at the instance of the Central Government, impose such further conditions as may be necessary in the interest of mineral development, including development of atomic minerals.

(IV) In the case of breach of any condition imposed on any holder of prospecting licence by or under this rule, the State Government may, by order in writing, cancel the licence and/or forfeit, in whole or part, the amount deposited by the licensee under rule 20 :Provided that no such order shall be made without giving the licensee a reasonable opportunity of stating his case.

(V) Licence to be executed within three months :

- (a) Where on any application for a prospecting licence an order has been made for the grant of such licence, a deed granting such licence shall be executed within ninety days of the date of the communication of the order or such further period as the State Government may allow in this behalf, and if no such deed is executed within the said period due to any default on the part of the applicant, the State Government may revoke

the order granting the licence and in that event the fee paid shall be forfeited to the State Government.

(b) The deed referred to in sub-rule (1) shall be in Form F, or in a form as near there to as circumstances of each case may require.

(c) The date of the commencement of the period for which a prospecting licence is granted shall be the date on which the deed is executed under sub-rule (1).

**Rules for Grant of Mining Lease:** For granting the mining lease application in following format has to be submitted:

**Applications for grant of mining leases:-**

(1) An application for the grant of a mining lease in respect of land in which the minerals vest in the Government shall be made to the State Government in Form I through such officer or authority as the State Government may specify in this behalf.

(2)(i) Every application for the grant or renewal of a mining lease shall be accompanied by –

(a) a [non refundable] registration fee;

(b) A valid clearance certificate in the form prescribed by the State Government, of payment of mining dues, such as royalty or dead rent and surface rent payable under the Act or the rules made there under, from that Government or any officer or authority authorised by that Government in this behalf :

- Provided that in case the applicant is a partnership firm or a private limited company, such certificate shall be furnished by all partners of the partnership firm or, as the case may be, all members of the private limited company :
- Provided that where any injunction has been issued by a court of law or any other competent authority staying the recovery of any such mining dues or income tax non-payment there of shall not be treated as a disqualification for the purpose of granting or renewing the said mining lease :
- Provided that where a person has furnished an affidavit to the satisfaction of the State Government stating that he does not hold and has not held a mining lease, it shall not be necessary for him to produce the said valid clearance certificate: Provided that a properly sworn affidavit stating that no dues are outstanding shall suffice subject to the condition that the certificate required as above shall be furnished within ninety days of the date of application and the application shall become invalid if the party fails to file the certificate within the said ninety days:
- Provided further that the grant of a clearance certificate under sub-clause (d) shall not be discharge the holder of such certificate from the liability to pay the mining dues which may subsequently be found to be payable by him under the Act or rules made there under.

(b)an affidavit stating that the applicant has –

- (i) filed up-to date income-tax returns;
- (ii) paid the income-tax assessed on him; and
- (iii) paid the income-tax on the basis of self-assessment as provided in the Income Tax Act, 1961;

(c) an affidavit showing particulars of area mineral-wise in the State, which the applicant or any person jointly with him –

- (i) already holds under a mining lease;
- (ii) has already applied for but not granted;
- (iii) being applied for simultaneously;

(d) a statement in writing that the applicant has, where the land is not owned by him, obtained surface rights over the area or has obtained the consent of the owner for starting mining operations:

- Provided that no such statement shall be necessary where the land is owned by the Government:  
Provided further than the consent of the owner for starting mining operations in the area or part there of may be furnished after execution of the lease deed but before entry into the said area : Provided also that no further consent would be required in the case of renewal where consent has already been obtained during grant of the lease.  
(ia) The State Government may, for reasons to be recorded in writing, relax the provision of sub-clause(d) of clause(i).
- (ii) Every application for the grant of a mining lease shall in addition to those special in clause (i) be accompanied by a deposit of one thousand rupees for meeting the preliminary expenses in connection with the grant of the mining lease: Provided that the applicant shall deposit such further deposit as may be asked for by the State Government, within one month from the date of demand of such deposit.

(3) On receipt of the application for the grant of a mining lease the State Government shall take decision to grant precise area for the said purpose and communicate such decision to the applicant. On receipt of communication from the State Government of the precise area to be granted, the applicant shall submit a mining plan within a period of six months or such other period as may be allowed by the State Government, to the Central Government for its approval. The applicant shall submit the mining plan, duly approved by the Central Government or by an officer duly authorised by the Central Government, to the State Government to grant mining lease over the area.

(3A) Notwithstanding anything contained in sub-rule (4), the State Government shall be competent to approve mining plan in respect of non-metallic or industrial minerals for mines other than 'A' category mines; as specified in sub-clause (i) of clause (b) of sub-rule (1) rule 42 of Mineral Conservation and Development Rules, 1988:

- Provided that the State Government shall exercise the power of approval of mining plan through an officer or officers having the requisite qualifications and experience for the purpose as may be prescribed by the Controller General, Indian Bureau of Mines from time to time:
- Provided further where any State Government does not have such officer as having the requisite qualifications and experience, the power of approval of mining plan, as aforesaid, in respect of that State shall be exercised by the Central Government: Provided also that in the event of the State Government having officer or officers with requisite qualifications and experience from any date in future the State Government shall report the matter to the Controller General, Indian Bureau of Mines and the State Government shall exercise the power of approval of mining plan as aforesaid, thereafter without any reference to the Central Government.

**(4) The Mining Plan shall incorporate :-**

- (i) the plan of the lease hold area showing the nature and extent of the mineral body, spot or spots where the mining operations are proposed to be based on the prospecting data gathered by the applicant or any other person.
- (ii) details of the geology and lithology of the area including mineral reserves of the area;
- (iii) the extent of manual mining or mining by the use of machinery and mechanical devices;
- (iv) the plan of the area showing natural water courses, limits of reserves and other forest areas and density of trees, if any, assessment of impact of mining activity on forest, land surface and environment including air and water pollution; details of scheme of restoration of the area by afforestation, land reclamation use of pollution control devices and such other measures as may be directed by the Central Government or the State Government from time to time;
- (v) a tentative scheme of mining and annual programme and plan for excavation from year to year for five years; and
- (v) any other matter which the Central Government may require the applicant to provide in the mining plan.

**(5) The mining plan once approved shall be valid for the entire duration of the lease: Provided that any modification or modifications of the mining plan shall be approved by the competent authority and such approval of the modified mining plan shall remain valid for the balance duration of the mining lease.**

**(6). Mining operations to be in accordance with Mining Plans :-**

- (i) Mining operations shall be undertaken in accordance with the duly approved mining plan.
- (ii) Modification of the approved mining plan during the operation of a mining lease also requires prior approval.

**(7).Mining plan to be prepared by recognised persons :-**

(1)No mining plan shall be approved unless it is prepared by a qualified person recognised in this behalf by the Central Government, or duly authorised officer.

(2)No person shall be recognised by the Central Government for purposes of sub-rule (1) unless he holds :-

(i) a degree in mining engineering or post-graduate degree in Geology granted by a university established or incorporated by or under a Central Act, a Provincial Act or a State Act, including any institution recognised by the University Grants Commission established under section 4 of the University Grants Commission Act, 1956 or any equivalent qualification granted by any University or Institution outside India; and

(ii) Professional experience of five years of working in a supervisory capacity in the field of mining after obtaining the degree.

(3) A person recognised to prepare a mining plan may also carry out modification of an existing mining plan.

**(8). Procedure for approval of mining plans :-**

(1) Notwithstanding the provisions of rule 63 the mining plan shall be submitted for approval through authority notified by the Controller General of the Indian Bureau of Mines or by the State Government, as the case may be, in this behalf, except for minerals specified in Part A and B of the First Schedule to the Act.

(2) Notwithstanding the provisions of the rule 54, any person aggrieved by any order made or direction issued in respect of mining plan by an officer of the Central Government competent to approve mining plans other than the Chief Controller of Mines, Indian Bureau of Mines, for minerals other than those listed in Part A and B of the First Schedule to the Act, may within thirty days of the communication of such order or direction, apply to the authority to whom the said officer is immediately subordinate, for the revision of the order or direction.

(3)On receipt of any application for revision under sub-rule (1), the authority after giving a reasonable opportunity of being heard to the aggrieved person, may confirm modify or set aside the order made or direction issued by any officer subordinate to him.

(4)Any person aggrieved by an order made or direction issued by the Chief Controller of Mines, Indian Bureau of Mines, concerning approval of mining plan may within 30 days of the communication of such order or direction, apply to the Controller General, Indian Bureau of Mines for a revision of such order or direction and his decision thereon shall be final :

Provided that any such application may be entertained after the said period of 30 days, if the applicant satisfies the Controller General, Indian Bureau of Mines that he had sufficient cause for not making the application in time.

(5) On receipt of any such application under sub-rule (4), the Controller General Indian Bureau of Mines may confirm, modify or set aside the order or direction issued by the Chief Controller of Mines, Indian Bureau of Mines.

(6)(a) Notwithstanding anything contained in the above sub-rules, any person aggrieved by any order or direction issued in respect of a mining plan by an authorised officer of the State Government, may within thirty days of the communication of such order or direction, apply to the Controller General, Indian Bureau of Mines for revision of the order or direction and his decision thereon shall be final.

(b) The procedure enumerated in the preceding sub-rules shall, mutatis mutandis, be followed in the disposal of such an application.

(7) The powers under sub-rules (1) and (2) in regard to approval of mining plans shall be exercised by Director, Atomic Minerals Directorate for Exploration and Research, Hyderabad, and in regard to revision under sub-rules (3) to (5) shall be exercised by Secretary, Department of Atomic Energy, Mumbai in so far as they relate to atomic minerals specified in Part B of the First Schedule to the Act.

(8) The powers under sub - rules (1) to (5) in regard to approval of Mining Plan and revision shall be exercised by authorities designated in this behalf by notification by the Department of Coal in so far as they relate to coal and lignite specified in Part A of the First Schedule to the Act].

**9. Grant of recognition by Central Government :** (1) Any person possessing the qualifications and experience referred to in sub-rule (2) of rule 22B may apply for being recognised as a recognised person to the competent authority appointed for the purpose by the Central Government.

(2) The competent authority, after making such enquiry as it deems fit, may grant or refuse to grant recognition and where recognition is refused, the competent authority shall record reasons in writing and communicate the same to the applicant.

(3) A recognition shall be granted for an initial period of ten years and may be renewed for a period(s) not exceeding ten years at a time :

- Provided that the competent authority may refuse to renew recognition for reasons to be recorded in writing after giving an opportunity of hearing to the person concerned.

(4) An appeal shall lie to the Controller General, Indian Bureau of Mines, against the order of the competent authority refusing to grant or renew an application for recognition and his order thereon shall be final.

Explanation : For the purpose of this rule, Chief Controller of Mines, Controller of Mines and the Regional Controller of Mines shall be deemed to be competent authority.

**10. Acknowledgement of application :-** (i) Where an application for the grant or renewal of a mining lease is delivered personally, its receipt shall be acknowledged on the same day.

(ii) Where such application is received by registered post, its receipt shall be acknowledged on the same day.

(iii) In any other case, the receipt of such application shall be acknowledged within three days of the receipt.

(4) The receipt of every such application shall be acknowledge in Form D.

### **11. Disposal of the application for mining lease :-**

(1) Where an application for a mining lease for a mineral or minerals not specified in the existing mining lease or mining leases is made for the whole or part of the area held under mining lease by a person other than the lessee, the State Government shall notify this fact by registered post/Acknowledgement Due to the person who already holds mining leases for another mineral in the land applied for.

(2)(a) If on receipt of the information referred to in sub-rule (1), from the State Government, the lessee applies either for prospecting licence or mining lease for newly discovered mineral or minerals within six months from the date of communication of the information by the State Government, the lessee shall be preferred in respect of such grant.

(b) If the lessee fails to apply for prospecting licence or mining lease within six months, then this fact will be intimated to the applicant by the State Government and the State Government will consider the original application in accordance with the rules.

### **12. Renewal of mining lease :-**

(1) An application for the renewal of a mining lease shall be made to the State Government in Form J, at least twelve months before the date on which the lease is due to expire, through such officer or authority as the State Government may specify in this behalf.

(2) The renewal of renewals of a mining lease granted in respect of a mineral specified in Part 'A' and Part 'B' of the First Schedule the Act may be granted by the State



Government with the previous approval of the Central Government.]

(3) If an application for renewal of a mining lease made within the time referred to in sub-rule (1) is not disposed of by the State Government before the date of expiry of the lease, the period of that lease shall be deemed to have been extended by a further period till the State Government passes order thereon.

(4) Notwithstanding anything contained in sub-rule (1) and sub-rule (6) an application for the first renewal of a mining lease, so declared under the provisions of section 4 of the Goa, Daman and Diu Mining Concessions (Abolition and Declaration as Mining Leases) Act, 1987, shall be made to the State Government in Form J before the expiry of the period of mining lease in terms of sub-section (1) of section 5 of the said Act, through such office or authority as the State Government in this behalf

- Provided that the State Government may, for reasons to be recorded in writing and subject to such conditions as it may think fit, allow extension of time for making of such application up to a total period not exceeding one year.

(5) If an application for first renewal made within the time referred to in sub-rule (8) or within the time allowed by the State Government under the provision to sub-rule (8), the period of that lease shall be deemed to have been extended by a further period till the State Government passes orders thereon.

(6) The State Government may condone delay in an application for renewal of mining lease made after the time limit prescribed in sub-rule (1) provided the application has been made before the expiry of the lease.

### **13. Renewal of a mining lease in favour of a person using the mineral in his own industry :-**

Every person who is holding a mining lease for a mineral which is used in his own industry shall be entitled for the renewal of his mining lease for a period not exceeding twenty years unless he applies for a lesser period.

Explanation :- "Own industry" means an industry of which the lessee is the owner or in which he holds not less than fifty percent of controlling interest.

### **14. Status of the grant on the death of applicant for mining**

**lease :-**

(1) Where an applicant for a grant or renewal of mining lease dies before the order granting him a mining lease or its renewal is passed, the application for the grant or renewal of a mining lease shall be deemed to have been made by his legal representative.

(2) In the case of an applicant in respect of whom an order granting or renewing a mining lease is passed, but who dies before the deed referred to in sub-rule (1) of rule 31 is executed, the order shall be deemed to have been passed in the name of the legal representative of the deceased.

## 15. Refusal of application for grant and renewal of mining lease :-

- (1) The State Government may, after giving an opportunity of being heard and for reasons to be recorded in writing and communicated to the applicant, refuse to grant or renew a mining lease over the whole or part of the area applied for.
- (2) An application for the grant or renewal of a mining lease made under rule 22 or rule 24A, as the case may be, shall not be refused by the State Government only on the ground that Form 1 or Form J, as the case may be, is not complete in all material particulars, or is not accompanied by the documents referred to in sub-clauses (d), (e), (g) and (h) of clause (i) of sub-rule 3 of rule 22.
- (3) Where it appears that the application is not complete in all material particular or is not accompanied by the required documents, the State Government shall, by notice, require the applicant to supply the omission or, as the case may be furnish the documents, without delay and in any case not later than sixty days from the date of receipt of the said notice by the applicant.

## 16. Conditions :- (1) Every mining lease shall be subject to the following conditions :-

- the lessee shall report to the State Government the discovery in the leased area of any mineral not specified in the lease, within sixty days of such discovery;
- (b) if any mineral not specified in the lease is discovered in the leased area, the lessee shall not win and dispose of such mineral unless such mineral is included in the or a separate lease lease is obtained therefore;
- (c) the lessee shall pay, for every year, except the first year of the lease, such yearly dead rent at the rates specified in the Third Schedule of the Act and if the lease permits the working of more than one mineral in the same area the State Government shall not charge separate dead rent in respect of each mineral. Provided that the lessee shall be liable to pay the dead rent or royalty in respect of each mineral whichever be higher in amount but not both;
- (d) the lessee shall also pay, for the surface area used by him for the purposes of mining operations, surface rent and water rate at such rate, not exceeding the land revenue, water and cesses assessable on the land, as may be specified by the State Government in the lease :
- (e) the lessee shall commence operations within two years from the date of execution of the lease and shall thereafter conduct such operations in a proper, skillful and workman-like manner. Explanation :- For the purpose of this clause, mining operations shall include the erection of machinery, laying of a tramway or construction of a road in connection with the working of the mine;
- (f) the lessee shall at his own expenses erect and at all times maintain and keep in good

repair boundary marks and pillars necessary to indicate the demarcation shown in the plan annexed to the lease;

(g) The lessee shall not carry on, or allow to be carried on, any mining operations at any point within a distance of fifty meters from any railway line, except under and in accordance with the written permission of the railway administration concerned or under or beneath any ropeway or ropeway trestle or station, except under and in accordance with the written permission of the authority owning the ropeway or from any reservoir, canal or other public work, or buildings, except under and in accordance with the previous permission of the State Government;

(h) the lessee shall keep [accurate and faithful] accounts showing the quantity and other particulars of all minerals obtained and dispatched from the mine, the number and nationality of persons employed therein, and complete plans of the mine, and shall allow any officer authorised by the Central Government or the State Government in this behalf to examine at any time any accounts, plans and records maintained by him and shall furnish the Central or the State Government with such information and returns as it or any officer authorised by it in this behalf may require;

(i) the lessee shall keep accurate records of all trenches, pits and drillings made by him in the course of mining operations carried on by him under the lease, and shall allow any officer authorised by the Central or the State Government to inspect the same. Such records shall contain the following particulars, namely :-

- (a) the subsoil and strata through which such trenches, pits or drillings pass;
- (b) any mineral encountered;
- (a) such other particulars as the Central or the State Government may from time to time require;
- (b) the lessee shall strengthen and support, to the satisfaction of the railway administration concerned or the State Government, as the case may be, any part of the mine which in its opinion requires such strengthening or support for the safety of any railway, reservoir, canal, road or any other public works or buildings;
- (c) the lessee shall allow any officer authorised by the Central or the State Government to enter upon any building, excavation or land comprised in the lease for the purpose of inspecting the same; (m) the State Government shall at all times have the right of pre-emption of the minerals won from the land in respect of which the lease has been granted; Provided that the fair market price prevailing at the time of pre-emption shall be paid to the lessee for all such minerals.
- (d) the lessee shall store properly the unutilized or non-saleable sub-grade ores or minerals for future beneficiation;

- (e) in respect of any mineral which in relation to its use for certain purposes is classified as a major mineral and in relation to its use for other purposes as a minor mineral, the lessee who holds a lease for extraction of such minerals under these rules whether or not it is specified as a major mineral in the leased deed, shall not use or sell the mineral or deal with it in whatsoever manner or knowingly allow anyone to use or sell the mineral or deal with it in whatsoever manner as a minor mineral : Provided that if on an application made to it in this behalf by the lessee, the State Government is satisfied that having regard to the inferior quality of such mineral, it cannot be used for any of the purposes by reason of which use it can be called a major mineral or that there is no market for such mineral as a major mineral, the State Government may by order permit the lessee to dispose of the mineral in such quantity and in such manner as may be specified therein as a minor mineral.
- (f) the lessee shall, in the matter of employment, give preference to the tribals and to the persons who become displaced because of the taking up of mining operations;
- (g) the lessee shall not pay a wage not less than the minimum wage prescribed by the Central or State Government from time to time under the Minimum Wages Act, 1948;
- (h) the lessee shall observe the provisions of Mines Act, 1952 [and of the Atomic Energy Act, 1962, (33 of 1962) insofar as they relate to Atomic Minerals included in Part 'B' of the Schedule to the Act;]
- (i) the lessee shall -
- (i) take immediate measures for planting in the same area or any other area selected by the Central or State Government not less than twice the number of trees destroyed by reasons of any mining operations;
  - (ii) look after them during the subsistence of the lease after which these trees shall be handed over to the State Forest Department or any other authority nominated by the Central or State Government;
  - (iii) restore, to the extent possible other flora destroyed by the mining operations;
- (j) the lessee shall pay to the occupier of the surface of the land such compensation as may become payable under these rules;
- (k) 1. the lessee shall comply with the Mineral Conservation and Development Rules framed under section 18;
- (2) A mining lease may contain such other conditions as the State Government may deem necessary in regard to the following, namely :-

(a) the time-limit, mode and place of payment of rents and royalties;  
 (b) the compensation for damage to the land covered by the lease;  
 (c) the felling of trees;  
 (d) the restriction of surface operations in any area prohibited by any authority;  
 (e) the notice by lessee for surface occupation;  
 (f) the provision of proper weighing machines;  
 (g) the facilities to be given by the lessee for working other minerals in the leased area or adjacent area;  
 (h) the entering and working in reserved or protected forest;  
 (i) the securing of pits and shafts;  
 (j) the reporting of accidents;  
 (k) the indemnity to Government against claims of third parties;  
 (l) the delivery of possession of lands and mines on the surrender, expiration or determination of the lease;  
 (m) the time limit for removal of mineral, ore, plant, machinery and other properties from the lease hold area after expiration, or sooner determination or surrender or abandonment of the mining lease.]  
 (o) the forfeiture of property left after determination of lease;  
 (p) the power to take possession of plant, machinery, premises and mines in the event of war or emergency;  
 (q) filing of civil suits or petitions relating to disputes arising out of the area under lease.

(3) The State Government may, either with the previous approval of the Central Government or at the instance of the Central Government, impose such further conditions as may be necessary in the interests of mineral development, including development of atomic minerals.

(4) If the lessee does not allow entry or inspection under clause (i), (j) or (l) of sub-rule (1), the State Government shall give notice in writing to the lessee requiring him to show cause within such time as may be specified in the notice why the lease should not be determined and his security deposits forfeited; and if the lessee fails to show cause within the aforesaid time to the satisfaction of the State Government may determine the lease and forfeit the whole or part of the security deposit.

(5) If the lessee makes any default in the payment of royalty as required under section 9 or payment of dead rent as required under section 9A or commits a breach of any of the conditions specified in sub-rules (1), (2) and (3), except the condition referred to in clause (f) of sub-rule (1), the State Government shall

give notice to the lessee requiring him to pay the royalty or dead rent or remedy the breach, as the case may be, within sixty days from the date of the receipt of the notice and if the royalty or dead rent is not paid or the breach is not remedied within the said period, the State Government may, without prejudice to any other proceedings that may be taken against him, determine the lease and forfeit the whole or part of the security deposit.

**17. Lapsing of leases :-** Sanctioned mining leases may be lapsed if:

(1) Subject to the conditions of this rule where mining operations are not commenced within a period of two years from the date of execution of the lease, or is discontinued for a continuous period of two years after commencement of such operations, the State Government shall, by an order, declare the mining lease as lapsed and communicate the declaration to the lessee.

(2) Where a lessee is unable to commence the mining operation within a period of two years from the date of execution of the mining lease, or discontinues mining operations for a period exceeding two years for reasons beyond his control, he may submit an application to the State Government explaining the reasons for the same, at least three months before the expiry of such period;

(3) Every application under sub-rule (2) shall be accompanied by a fee of Rs.200/-

(4) The State Government may on receipt of an application made under sub-rule (2) and on being satisfied about the adequacy and genuineness of the reasons for the non-commencement of mining operations or discontinuance thereof, pass an order before the date on which the lease would have otherwise lapsed, extending or refusing to extend the period of the lease :

Provided that where the State Government on receipt of an application under sub-rule (2) does not pass an order before the expiry of the date on which the lease would have otherwise lapsed, the lease shall be deemed to have been extended until the order is passed by the State Government or until a period of two years, whichever is earlier.

Explanation 1 : Where the non-commencement of the mining operations within a period of two years from the date of execution of mining lease is on account of –

- (a) delay in acquisition of surface rights; or
- (b) delay in getting the possession of the leased area; or
- (c) delay in supply or installation of machinery; or
- (d) delay in getting financial assistance from the banks, or any financial institutions; or
- (e) ensuring supply of the mineral in an industry of which the lessee is the owner or in which he holds not less than 50% of the controlling interest and the lessee is able to furnish documentary evidence supported by a duly sworn affidavit, the

State Government may consider if there are sufficient reasons for non-commencement of operations for a continuous period of more than two years.

Explanation 2 : Where the discontinuance of mining operations for a continuous period of two years after the commencement of such operations is on account of –

- (a) Orders passed by any statutory or judicial authority; or
- (b) operations becoming highly uneconomical; or
- (c) strike or lock out;

and the lessee is able to furnish documentary evidence supported by a duly sworn affidavit, the State Government may consider if there are sufficient reasons for discontinuance of operations for a continuous period of more than two years.

[Explanation 3 : In case of mining lessee who has undertaken reconnaissance operations or in case of mining lessee whose capital investment in mine development is planned to be in excess of Rs.200 crores and where the mine development is likely to take more than two years, the State Government shall consider it to be sufficient reason for non-commencement of mining operations for a continuous period of more than two years].

**18.(i)** Where a lessee is unable to commence the mining operations within a period of two years from the date of execution of the mining lease, or discontinuous mining operations for a period of exceeding two years for reasons beyond his control, he may submit an application to the State Government explaining the reasons for the same at least within six months from the date of its lapse :

Provided that the lease has not been revived under this provisions for more than twice during the entire period of the lease.

(ii) Every application under sub-rule (1) shall be accompanied by a fee of Rs.500/- <

(iii) The State Government on receipt of an application made under sub-rule (1) and on being satisfied about the adequacy and genuineness of the reasons for non-commencement of mining operations or discontinuance thereof taking into consideration the matters specified in the Explanation to rule 28, pass an order reviving the lease.

**19.** Restriction on determination of lease :-

(i) The lessee shall not determine the lease except after notice in writing of not less than twelve calendar months to the State Government or to such officer, or authority as the State Government may specify in this behalf :

- Provided that where a lessee holding a mining lease for a group of minerals applies for the surrender of any mineral from the lease on the ground that deposits of that mineral have since exhausted or depleted to such an extent that it is no longer economical to work the mineral, the State Government may permit the lessee to surrender that mineral, subject to the following conditions, namely :
  - (a) the lessee applies for such surrender of mineral at least six months before the intended date of surrender; and
  - (b) the lessee gives an undertaking that he will not cause any hindrance in the working of the mineral so surrendered by any other person who is subsequently granted a mining lease in respect of that mineral :  
 Provided further that where a lessee applies for the surrender of the whole or a part of lease-hold area on the ground that such area is barren or the deposits of minerals have since exhausted or depleted to such an extent that it is no longer economical to work such area, the State Government shall permit the lessee, from the date of receipt of the application, to surrender that area if the following conditions are satisfied, namely :-
    - (a) the lease-hold area to be surrendered has been properly surveyed and is contiguous.
    - (b) the lessee has paid all the dues payable to the Government under the lease up to the date of application, and
- Provided also that surrender of the lease area by the lessee shall be permitted only thrice during the period of the lease on fulfilling the conditions –
  - (i) that at least a period of five years has elapsed since the last surrender; and
  - (ii) that the provisions of the mining plan including the environment management plan there of have been complied with.
  - (iii) Every application for the surrender of a part of lease-hold area in accordance with the provisions of sub-rule (1), shall be accompanied by a deposit of two hundred rupees for meeting the expenditure for the purpose of survey and demarcation of the area to be surrendered:
- Provided that the lessee shall deposit such further amount, not exceeding two hundred rupees, as may be demanded by the State Government for meeting any additional expenditure for the said purpose within one month from the date of demand of such deposit :



- Provided further that where the whole or any part of the amount deposited has not been expended, it shall be refunded to the lessee within two months from date of the completion of the work of survey and demarcation of the area to be surrendered.

**20. Rights of lessee :-**

Subject to the conditions mentioned in rule 27, the lessee with respect to the land leased to him shall have the right for the purpose of mining operations on that land –

- (a) to work the mines;
- (b) to sink pits and shafts and construct buildings and roads;
- (c) to erect plant and machinery;
- (d) to quarry and obtain building and road materials and make bricks;
- (e) to use water and take timber;
- (f) to use land for stacking purpose;
- (g) to do any other thing specified in the lease.

**21. Lease to be executed within six months:-**

(1) Where, on an application for the grant of a mining lease, an order has been made for the grant of such lease, a lease deed in Form K or in a form as near there to as circumstances of each case may require, shall be executed within six months of the order or within such further period as the State Government may allow in this behalf, and if no such lease deed is executed within the said period due to any default on the part of the applicant, the State Government may revoke the order granting the lease and in that event the application fee shall be forfeited to the State Government.

(2) The date of the commencement of the period for which a mining lease is granted shall be the date on which a duly executed deed under sub-rule (1) is registered.

**22. Security deposit :-** An applicant for a mining lease, shall before the deed referred to in rule 31 is executed, deposit as security for the due observance of the terms and conditions of the lease [as prescribed by the Government].

**23. Survey of the area leased :-** When a mining lease is granted by the State Government, arrangements shall be made by the State Government at the expense of the lessee for the survey and demarcation of the area granted under the lease.

**34. Manner of exercise of preferential rights for mining lease :-** A mining lease to any person who has a preferential right there to under sub-section (1) of section 11, may at his option, be granted to him either for the whole of the area for which he holds the prospecting licence or such part or parts there of as he may select but the State Government may for any special reasons to be recorded in writing reduce the area or exclude a portion therefrom.

**25. Preferential rights of certain persons :-** Where two or more persons have applied for a reconnaissance permit or a prospecting licence or a mining lease in respect of the same land, the State Government shall, for the purpose of sub-section (2) of Section 11, consider, besides the matters mentioned in clauses (a) to (d) of sub-section (3) of section 11, the end use of the mineral by the applicant.]

**26. Boundaries below the surface :-** The boundaries of the area covered by a mining lease shall run vertically downwards below the surface towards the centre of the earth.

**27. Transfer of lease:-** Sanctioned Mining lease may be transferred following rules:

(1) The lessee shall not, without the previous consent in writing of the State Government and in the case of mining lease in respect of any mineral specified in '[Part 'A' and Part 'B' of] the First Schedule to the Act, without the previous approval of the Central Government :-

(a) assign, sublet, mortgage, or in any other manner, transfer the mining lease, or any right, title or interest therein, or

(b) enter into or make any [bonafide] arrangement, contract or understanding whereby the lease will or may be directly or indirectly financed to a substantial extent by, or under which the lessee's operations or undertakings will or may be substantially controlled by, any person or body of persons other than the lessee: Provided further that where the mortgagee is an institution or a Bank or a Corporation specified in Schedule V, it shall not be necessary for the lessee to obtain any such consent of the State Government.

(2) the State Government shall not give its consent to transfer of mining lease unless the transferee has accepted all the conditions and liabilities which the transferor was having in respect of such mining lease.

(3) Without prejudice to the provisions of sub-rule (1) the lessee may, subject to the conditions specified in the provision to rule 35, transfer his lease or any right, title or interest therein to a person who has filed an affidavit stating that he has filed an up-to-date income-tax returns, paid the income tax assessed on him and paid the income tax on the basis of self-assessment as provided in the Income Tax Act, on payment of a fee of five hundred rupees to the State Government;

- Provided that the lessee shall make available to the transferee the original or certified copies of all plans of abandoned workings in the area and in a belt 65 metres wide surrounding it; Provided further that where the mortgagee is an institution or a Bank or a Corporation specified in Schedule V, it shall not be necessary for any such institution or Bank or Corporation to meet with the requirement relating to income tax:

- Provided further that the lessee shall not charge or accept from the transferee any premium in addition to the sum spent by him, in obtaining the lease, and for conducting all or any of the operations referred to in rule 30 in or over the land leased to him.

(4) The State Government may, by order in writing determine any lease at any time if the lessee has, in the opinion of the State Government, committed a breach of any of the provisions of sub-rule (1) or sub-rule (1A) or has transferred any lease or any right, title, or interest therein otherwise than in accordance with sub-rule (2) : Provided that no such order shall be made without giving the lessee a reasonable opportunity of stating his case.

**28. Transfer of lease to be executed within three months :-**

Where on an application for transfer of mining lease under rule 37, the State Government have given consent for transfer of such lease, a transfer lease deed in Form O, or a form as near there to as possible, shall be executed within three months of the date of the consent, or within such further period as the State Government may allow in this behalf.

**29. Amalgamation of leases :-**

The State Government may, in the interest of mineral development and with reasons to be recorded in writing, permit amalgamation of two or more adjoining leases held by a lessee :

- Provided that the period of amalgamated leases shall be co-terminus with the lease whose period will expire first;
- Provided further that prior approval of the Central Government shall be required for such amalgamation in respect of leases for minerals specified in Part 'A' and Part 'B' of the First Schedule to the Act]

**30. Pending applications for transfer and amalgamation :-**

An application for the transfer of a mining lease or the amalgamation of mining leases pending at the commencement of these rules shall be disposed of in accordance with these rules].

**National Mineral Policy, 2008:**

**SALIENT FEATURES**

- Provision of financial assistance for development of mineral industry & trade tax relaxation on capital investment of Rs. 10 crore or more.
- Role of Government as promoter & catalyst in the changed scenario of economic liberalisation for mineral development.
- Identification of Mineral Concentration Districts (MCDS). In UP Allahabad, Banda, Hamirpur, Jalaun, Jhansi, Lalitpur, Mahoba, Mirzapur, Saharanpur & Sonbhadra districts are declared as MCDS.

- Focused attention on these MCDS for mineral development works including exploration in these areas.
- Financial Institutions to provide financial assistance for mineral based industry on priority in Mineral Concentration Districts.
- District Industries Centres of the Mineral Concentration Districts (MCDS) to have special cells called 'Khanij Mitra' to provide special assistance to the entrepreneurs.
- Special arrangements for infrastructure development in mining areas in Mineral Concentration Districts (MCDS).
- With the objective of adopting competitive, transparent & trouble free oriented system, concessions of most of the minor minerals shall be sanctioned through Open Auction System.
- Effective steps /Action Against Malices like illegal mining & irregular transportation of minerals & mine products will be taken.
- Simplification of Procedures & decentralisation of complex procedures of leases for mineral development & to ensure punctuality .
- Provision to solve problems of entrepreneurs through single table under one roof system.
- Encouragement to private sector through simplification in capital investment & encouragement of foreign capital investment .
- Preference to technically qualified & financially sound entrepreneurs in sanctioning mining lease.
- Special provision of infrastructural development in mining sectors, provision to provide consultancy through experts & provide equipments on lease of the Geology & Mining Department to the entrepreneurs.
- The State Government will create 'Khanj Vikas Nidhi' (Mineral Development Fund) by providing five percent of the revenue collection.
- Provision of modern equipments for exploration & testing by this fund.
- Arrangement of providing computerised database.
- Welfare schemes to be initiated for reclamation of mined Land.

- Uplift of Socially Backward Sections by offering new opportunities of social security/development & employment to mining workers
  - Arrangement of monitoring security & welfare schemes for workers engaged in mining activity.
  - Creation of New Job opportunities by promoting mines & mineral industrialisation.
- To maintain environmental & ecological balance along with exploitation of mineral resources.

### **MoEF Core Group, 2010 Recommendations for Mining Policy:**

- Mining of minor minerals needs to be subjected to strict regulatory parameters just like mines of major minerals.
- Minimum size of mining lease for minor minerals should be 5 ha & it should be given for minimum period of five years.
- Mine plans should be made mandatory for minor minerals as well.
- A separate Corpus should be created for Reclamation & Rehabilitation of mined areas no longer in use.

### **Draft National Mineral Policy, 2015:**

- Under the new Draft National Mineral Policy, 2015, the Environment, Forest & Climate Change ministry (MOEFCC) has for the first time delegated the power of granting environmental clearances (ECs), for mining leases including minor minerals too, up to 5 hectares to **District Level Committees (DLCs)**.
- Development of IT-Enabled Monitoring System to stop illegal mining & its transportation.
- Stringent monitoring of movement of mined out material from source to destination using information technology tools like using android applications, GPS & bar-coding systems to track vehicles of illegal miners.
- The new policy has exempted certain categories from the requirement of an EC, which includes extraction of ordinary clay or Sand manually by the Kumhars (Potters) & by Earthen Tile makers & removal of Sand deposits on agricultural fields post floods by farmers.

## **Impact of Mining on Socio-economic and Livelihood of Local Communities:**

India is a country with rich natural heritage. It bears the weightage of naturally well-designed hub that preserves its natural environment in such a way that it has the ability to invite the commercial activities to exploit the same. In the era of globalization, in order to uphold the country in the wave of development, varieties of commercial activities including mining has emerged. Though the impact of mining is large-scale, still It cannot be overlooked the loss in the sphere of social structure as it also bears the changes in large scale. We cannot ignore the fact that change in one aspect provokes the change on other aspects too. When mining is taking place in large scale it not only shades impact on environment, livelihood or health, but also the structural aspects are implementing insignificant changes.

Mining generally has both positive and negative impacts on local communities. Companies engaged in gravel mining may contribute to the development of key socioeconomic infrastructure such as roads, hospitals, schools and housing. While revenues accruing from mining activities contribute positively to the economy of the community, gravel mining activities serve as a major source of employment for local people, and trigger the establishment of a wide range of small businesses such as transport of minerals etc. Mining disturbs strong cultural ties of the indigenous communities and also disintegrates their culture and identity (Baguilat, 2011, Wetzlmaier,2012). Ever since the intrusion of mining industries, the Vindhyan mining region has endorsed some socio-cultural alterations. The rural society of this belt is becoming urban and the process of migration is giving birth to a new class of people who are engaged in making contracts with the mining companies and lease owners. Mining has been reported to affect the socio-cultural adjustment in the mining belt and responsible for increase in crime, divorce, consumption of alcohol and high incidence of variety of diseases are increasing in the mining belt of San Juan country and the village of Cuba (Supalla and Gray, 1977). Not only the socio-cultural setup was disturbed, it has also messed up the traditional socio-political systems which lead to the disorganization of the community and their sense of unity (Wetzlmaier, 2012).

Mining has affected the family structure. According to Das, 2016, the change in family structure is not at all obvious; rather it occurs as a result of inability to cope with the race of new economic development. When source of livelihood was not so diversified and society was mostly an agro-based, human mobility was limited. The joint family system which was based on the

principle of joint ness best suited to an agrarian society where mobility was limited; specialization was simple and custom was indisputable. But following a process of change due to industrialization in the form of mining the traditional joint family in India has also shown a remarkable change in its structure and function. Mining which enters as an externality came with industrialization, modernization and urbanization. It opened up and widened the scope of sources of livelihoods. Many a time an unusual hassle occurs when a large amount of workers from the neighbouring habitats are paid employment in the adjacent mining operations, which upshots insignificant demographic changes (Hilson, 2002 a, b,2010). This in turn leads to the foundation of some undesirable interruptions such as distraction from communal equilibrium, change in the way of life, disintegration of shared beliefs, customs, political systems, values and language, local culture, disruption towards archaic mode of hunting and fishing, change in family structure, growing demand for property and native capitals, constant worry for water supply and local sewage system, introduction of amplified cost of living, and proliferation of some socially avoidable accomplishments such as prostitution (Vanclay, 2002).Mining has also reported to affect the agricultural practices and the emotional attachments of the society for their agricultural lands (Das,2015, Das and Mishra 2015).

Mining has direct impacts (positive/negative) on the local communities and their livelihoods. Mining in the area created a new source of livelihoods, but at the same time it is also affecting the age old livelihood systems. The rural communities used to practise one or more varieties of livelihoods by employing their own knowledge, skill, physical labour and sometimes through education and experimentation (Chambers and Conway, 1991b). It can be termed as sustainable (environmentally and socially) when it enriches both the local and global resources which govern the livelihoods, and at the same time constructs supplementary sources of revenue. Meanwhile, it can improve stress and shocks as well as preserve it for imminent cohorts (Chambers and Conway, 1991a). Environmental sustainability refers to the external impact of livelihood on local and global level resources and on both tangible and intangible assets. Social sustainability refers to the internal ability of a livelihood to bear up external burden. It can also cope with stress and shocks as well as it can assure the capability to adapt the change. The human livelihood found vulnerability in two phases i.e. stresses and shocks. While stress is continuous and cumulative, it predicts the situations like seasonal shortage, rising population,

declining resources etc. On the other hand, shocks are usually impulsive and unpredictable such as fires, floods and epidemics. Hence, livelihood can be sustainable when it not only indulges itself to avoid the endeavour of shocks and stress but also can cope with them for its recovery (Chambers and Conway, 1991c).

### **Impact on Floral Biodiversity and Soil Characteristics:**

Soil may be defined as a thin layer of earth's crust which serves as a natural medium for growth of plants resulting from the transformation of surface rock by the combination of climate, plant, animal life and time (Zonn, 1986). They serve as a reservoir of nutrients and water for plants; provide mechanical anchorage and favourable filth. The soil is a resilient ecosystem. The components of soil are mineral matter, organic matter, water and air, the proportions of which vary and hence there is a need to study the soils in perspective. The physical properties of soil such as texture, structure, density, porosity, water content, consistency, temperature, and colour are dominant factors affecting the use of soil. These properties determine the availability of oxygen in the soil, the mobility of water into or through the soil and ease of root penetration. In assessing the fertility of soil, their physical properties are important (Brady, 1990).

The mineral extraction through mining process drastically alters the physical and biological nature of a mined area. It causes extensive soil damage and by the process of removing desired mineral material, soil is either lost or buried by waste or is spoiled by both. The mined areas are usually confronted with a complete absence of soil, in either a pedological or a biological sense, and what is left is just a skeleton full of limiting factors (Singh *et. al.*, 2002).

Floral composition of an area may be correlated with Biodiversity. More simply, it is species richness of plants .It is a manifestation of the evolutionary processes that have occurred in the earth's history. Biodiversity found in a particular area is a product of the physical environment; it is the abiotic components of the ecosystems that shape up the diversity of life and vice-versa. Mining is an economic activity that withdraws resources from nature; it uses natural resource capital. The forests and mining are intimately and intricately linked. The forests are the worst victims of the mining activities, which can be gauged from the denudation of the forest cover in all the mine belts. Natural Plant communities get disturbed due to mining activities and following mining, the habitats become impoverished presenting a very rigorous



condition for its growth (Bell *et. al.*, 2001; Sarma, 2005, Dubey and Dubey, 2013). The unscientific mining of minerals poses a serious threat to the environment resulting in the reduction of forest cover, erosion of soil at a greater scale, pollution of air, water and land and reduction in biodiversity (UNESCO, 1985; Swer and Singh, 2004; Sarma, 2002). Although, mining operation has definitely brought wealth and employment opportunity in the area, but simultaneously it has also led to extensive environmental degradation and erosion of traditional values in the society. Environmental problems associated with mining have been felt severely because of the region's fragile ecosystems and richness of biological and cultural diversity.

## **Objective and Methodology**

### **Objectives:**

Mining is a major economic activity in many developing countries including India. Mining operations, whether small or large-scale, are inherently disruptive to the environment, producing enormous quantities of waste that can have deleterious impacts for decades. The environmental deterioration caused by mining occurs mainly as a result of inappropriate and wasteful working practices and rehabilitation measures. Mining has a number of common stages or activities, each of which has potentially-adverse impacts on the natural environment, society and cultural heritage, the health and safety of mine workers, and communities based in close proximity to mining operations. Land mining in nearby area of forest was mainly focused for the study. General objective of the study is to assess the socio-economic and ecological impacts of mining in Vidhyan Region districts *viz*: Allahabad, Mirzapur and Sonbhadra. Keeping this in view, present study has following objectives:

- Survey & Identification of the major mining areas in the Vindhyan Region of Uttar Pradesh.
- Study the effect of Government Mining Policy on mining in the region.
- Study the effect of mining activities & Government Mining Policies on the socio-economics of the local people & their dependency on mining for their livelihood sustainability.
- Study the effect of mining activities on the vegetation of the region & soil characteristics.

- Study the views & perceptions of the local people regarding the reclamation of these mining areas after mining closure & their preferential choices for post mining Land use.

### **Methodology:**

For the research study, both qualitative and quantitative methods were adopted. Data regarding the field area were collected both from primary as well as secondary sources. Primary sources include data collected through direct field sampling, observations based on schedules, questionnaires etc. Secondary sources include various reports, records, literatures, documents, maps, charts, and photographs etc, collected from various public and private organizations. Data regarding the types of mining, its history and total number of sanctioned mine leases, revenue generated by mining practices etc was collected from the Mine Department, Revenue Department and the District Authority of the State of Uttar Pradesh. GPS readings for all identified mines selected for the study was recorded. The Socio-economic study was conducted in Stratified Random Sampling manner in the mining regions of Allahabad, Mirzapur and Sonbhadra districts in the Vindhyan region of Uttar Pradesh from near about 1200 respondents (400 from each district). The survey mainly targeted to the mining communities in the region. The Socio-economic survey was carried out in the nearby human inhabitations (villages) of mining sites in order to study the existing resources of the area, land use, social structure of the community, employment patterns, income generation activities, dependency on forests and species preferred by the local people along with information on other related environmental and socioeconomic aspects. Detailed information on demography, labour allocation and employment, dependence on forest products, health and perceptions of change in the local environment was elicited through the interviews. The study was performed in mining areas by using Participatory Rural Appraisal (PRA) tools and by Questionnaire based pre-structured Feedback Surveys and Interviews (Annex. 1). Participatory Rural Appraisal (PRA) had covered the village areas whereas Questionnaire based pre-structured Feedback Surveys and Interviews was done in the nearby town areas of mining sites. Economic status levels and forest dependency was also studied. The Questionnaire contains the questions covering environmental and socio-economic aspects of mining, forest and forestry related issues viz. peoples' views about forestry, their choice of species, existing agro-forestry systems, mining in the area, its effects and the reclamation status of the mined out areas. The Questionnaire consisting of two parts. The first

part have the objective questions seeking the personal information about the respondents i.e. their name, educational qualification, occupation, land holding, family structure, economic status etc, while the second part consists the subjective questions, designed for the information regarding the people's perception about forestry, awareness about their surroundings, their dependency on forest, sources of livelihoods, opinion regarding the mining activities, environmental degradation due to mining and their level of responsibility and understanding about reclamation of mined out areas. The respondents were selected so as to comprise all strata of people; economic, social and educational, including all age classes along with adequate representation of ladies in order to avoid age and gender biases. Interviews was conducted jointly as well as severally, depending exclusively, on the objective, as it is commonly felt that respondents from the lower strata may not be forthcoming outrightly in presence of the influential and affluent sections of the people. Similarly, ladies were also interviewed independently so that they may express their opinion freely. Mine owners were also interviewed, mainly regarding mining and Environmental Management Plans (EMPs), Extension of Mining Leases, Economics of Mining and Impact of prevalent Mining Policies and Programmes.

Following methodology has been adopted for the study:

- Data collection regarding the types of mining, its history and total number of sanctioned mine leases, revenue generated due to mining etc from the Mine Department, Revenue Department and the District Authority of the State of Uttar Pradesh.
- Survey of mining areas in Allahabad and Sonbhadra districts in the Vindhyan region of Uttar Pradesh and selection of different mining sites for the study.
- The Socio-economic survey was carried out in the nearby human inhabitations (villages) / fringe areas of mining sites in order to study the existing resources of the area, land use, social structure of the community, employment patterns, income generation activities, dependency on forests and species preferred by the local people along with information on other related environmental and socioeconomic aspects through Questionnaire based pre-structured Feedback Surveys and Interviews.
- To study the impact of mining on the local environment through vegetation survey and soil analysis, within the periphery of 100 m from the boundaries of mining areas.
- Data compilation.

### **Data Collection techniques used for Socio Economic Survey:**

The sample frame of this study consists of communities close to mining sites. A blend of quantitative and qualitative data collection techniques namely Participatory Rural Appraisal (PRA) tools, direct observations through questionnaire based survey and focus group discussions through stakeholder meetings were employed.

- **Participatory Rural Appraisal :** Face-to-face interview conducted with the villagers to obtain information regarding household heads, live stocks, income, dependency on forest, impacts of mining, choice of species for reclamation from nearby communities in the study area.
- **Direct Observation:** Direct observation was used throughout the pre-structured questionnaire based survey.
- **Focus Group Discussion:** Focus Group Discussions were held in all three districts through organization of Brainstorming Session with Stakeholders . The purpose of this was to validate some of the pertinent responses given during the questionnaire based survey and to discuss issues relevant to the study like Sanction of Mining Lease, Disputes related to Land, Mine Workers & Wages etc., Mining Policy, Rules & Regulation related issues, Social & Ecological Issues and Other issues specified by stake holders. it was also to gather unbiased and balanced views from all stakeholders jointly.

### **Soil and Vegetation Sampling and analysis:**

#### **Soil Sampling and Analysis:**

Soil tests and their interpretations are based on the samples analysed. Triplicate soil samples were collected from mining site and undisturbed site adjacent to mining area (100 m from active mining site). All soil samples were prepared by thoroughly mixing of soils from three spots. Soil samples from the area were collected randomly. The samples were analyzed for texture, water holding capacity, pH, conductivity, moisture content, total nitrogen and organic matter. Soils were sieved through a 2 mm mesh screen for chemical analysis. Methodology adopted followed as described by Piper (1944).

### **Floral Analysis:**

The vegetation survey was conducted at mining site and site adjacent to mining area by using Standard Quadrat Method (Srivastava, 2001) during peak growth season in the month of September and October. Species diversity indices were calculated. Quantitative community characteristics such as frequency, density and abundance of each species were determined, following the methods as described by Misra (1968). Density and frequency values of recorded species were calculated and resultant frequency values were classified into frequency classes *viz.* class A (1-20%), class B (21-40%), class C (41-60%), class D (61-80%) and class E (81-100%).

### **Importance Value Index (IVI):**

The Importance Value Index (IVI) for each of the species was determined as the sum of the relative frequency and relative density only. Importance Value Index, Relative Frequency and Relative Density were calculated by using the following formula (Kohli *et. al.*, 2004, Dubey, 2010):

### **Similarity Index (SI):**

Similarity Index between floristic composition of disturbed and undisturbed sites was determined by using Jaccard's Index of similarity based on presence or absence of species that are shared between samples of vegetation and species that are unique to each sample by following the method described by Krebs's, 1999 and by Dubey, 2010. This index determines the similarity in biodiversity of two different sites. For example if the Jaccard's Index of similarity is calculated as 0.65 between two different systems, it means the similarity in floral diversity is 0.65 and dissimilarity is 0.35. In this case, it will be concluded as the mining is impacting the diversity by 35 %.

## **Socio-economic Survey of the Mining Area in Vindhyan Region**

Degradation of natural resources, from whatever causes, can have a high human cost for the local poor and the underprivileged populace. Thus, preservation and even regeneration of natural resources are needed not only for sustainability but also for protecting and helping the local people (Parikh, 1998).

The Vindhyan region as been gifted with huge resources of minerals. Looking to the kind and quality of the major and minor minerals that are found here, it has gained wide economic importance and recognition as a major source of revenue of the region. Mining operation, undoubtedly, has brought wealth and employment opportunity in the area but simultaneously it has also led to extensive environmental degradation and erosion of traditional values in the society. Socio-economic profile is an essential tool to obtain complete social and economic information about any particular community and to study the impacts of mining on socio economic conditions of local populace. Further, an analysis of social and economic activity can help to understand the prevailing socio-economic outlines such as demographic details, land holding, household pattern, ethnic composition, language and communication, social organisation etc, impact of mining on livelihoods, its closure on livelihoods of local people. The study was undertaken to evaluate the socio-economic status of the communities inhabiting the surrounding areas, their awareness level about their environment and forest and associated interdependencies and interaction.

The socio-economic survey was carried out in the nearby human inhabitations (villages) of mining area to study the existing resources of the area, social structure of the community, employment pattern, income generation, dependence on forest and species preferred by the local people along with information on other related socioeconomic aspects. The study was performed in mining area by using Participatory Rural Appraisal (PRA) tools and by Questionnaire based pre-structured Interviews. Study conducted in mining area of Allahabad, Mirzapur and Sonabhadra Districts of Vindhyan region.

**ALLAHABAD District**  
**Socio-Economic Profile**  
**&**  
**Impacts of Mining on Vegetation & Soil Parameters**

**Description of Study Districts:**

**DISTRICT –ALLAHABAD**

**Location-** District lies in the south east of Uttar Pradesh, bounded by Pratapgarh and Jaunpur in the north, Sant Ravidas Nagar in the east, Kaushambi & Fatehpur in the west & Mirzapur in the southeast.

**Toposheet No-**63G, 63K

**Latitude-**24<sup>0</sup>47' N - 25<sup>0</sup>47' N

**Longitude-**81<sup>0</sup>36'30" E - 82<sup>0</sup>22'48" E

**Area-** 5482 sq. Km

**Geological Setup:** The area is mostly covered by alluvium with exposures of Vindhyan Super Group.

**Major Rivers-** Ganga & Yamuna

**Minerals:**

Deposits of Silica Sand, Stone (Gitti & Boulder) & ordinary Sand have been reported in various parts of the district. Glass Sands deposits are found in Shankargarh & Lohgara (Tehsil Bara) & Building stone (Kaimur Sandstone) is found in the southern parts of the district (Meja & Korao tahsil) & extracted either by blasting or by splitting the chief quarries. Geological map of the district is given as Figure 2. District Allahabad enriched with following minerals:

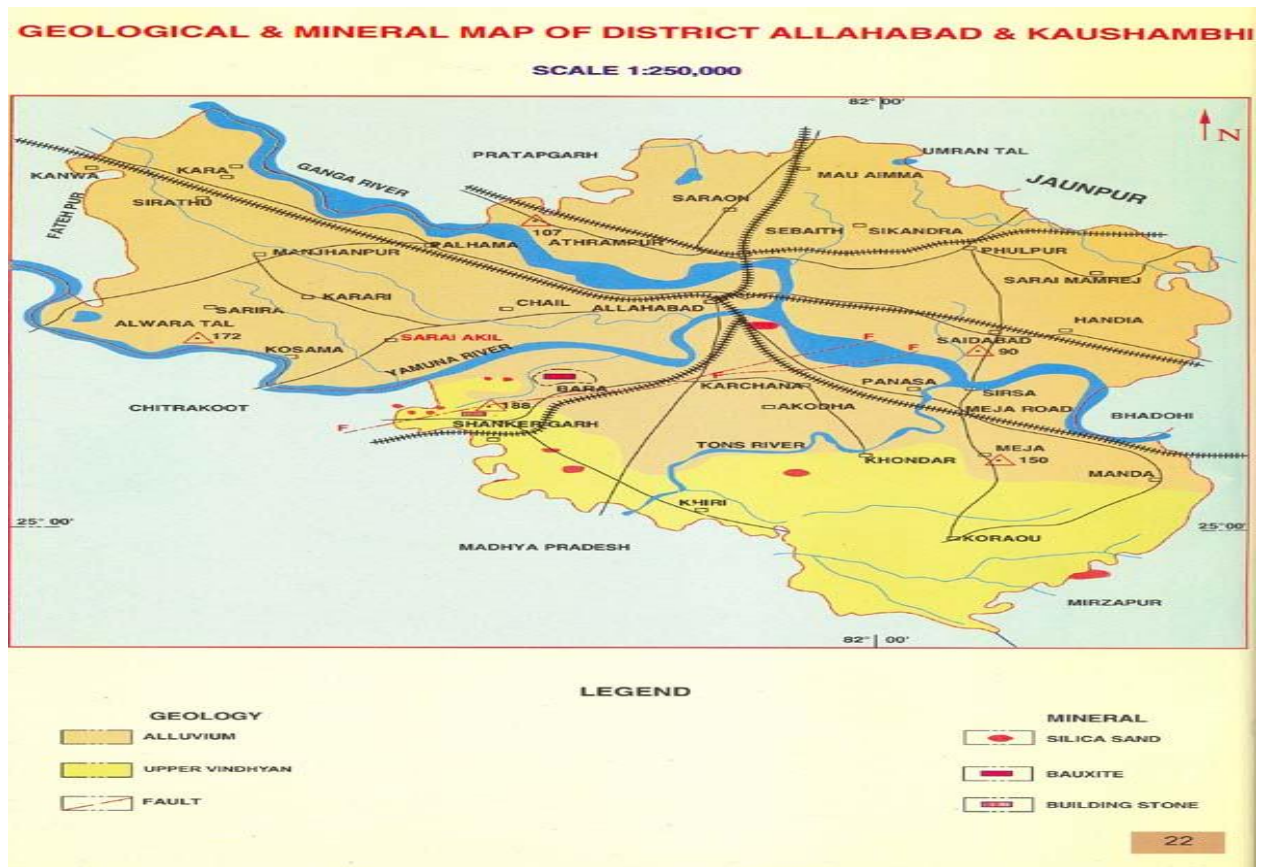
- **Major mineral-** major mineral of district is Silica Sand (Reserve as on Mar.31<sup>st</sup> 2006: Silica Sand-130.00 lakh tonnes)
- **Minor minerals-** Minor minerals of the district are Sandstone, grit & ballast

**Revenue from major & minor minerals (2013-2014) - Rs.1325 Lakhs**

Sand /Morum Mining site: Ganga & Yamuna River Zone

Silica Sand Mining Sites: Shankargarh in Tehsil-Bara.

Stone Mining site : Mainly in Bara, Meja & some area of Korao Tahsil.



**Fig. 2: Geological map of Allahabad District.**

**Mining Area in Allahabad:** Major mining areas of district is as below:

- Silica Sand Mining Sites: Shankargarh in Tehsil-Bara.
- Sand /Morum Mining site: Ganga & Yamuna River Zone
- Stone Mining site : Mainly in Bara, Meja & some area of Koraon Tahsil.

**Socio- Economic Profile of Allahabad District and Impacts of Mining:**

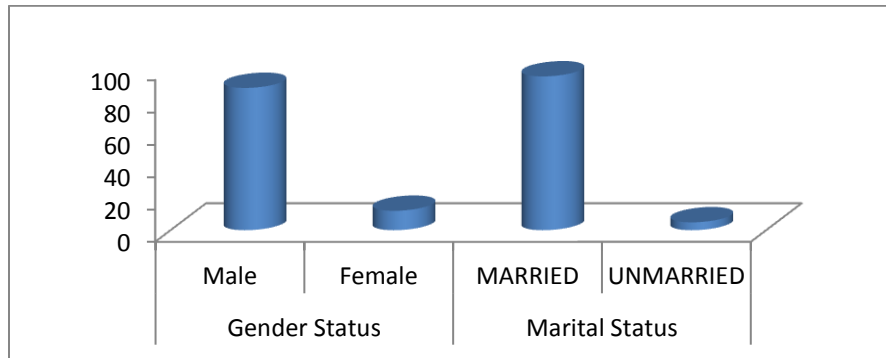
**Socio-demographic characteristics of the respondents.**

**Gender & marital Status of the Respondents:**

Figure 3 shows the Gender and marital Status of the Respondents for the mining area in Allahabad. Out of the total respondents 88 % were male and 12% were female. 95 % respondents were married and 5 % were unmarried.



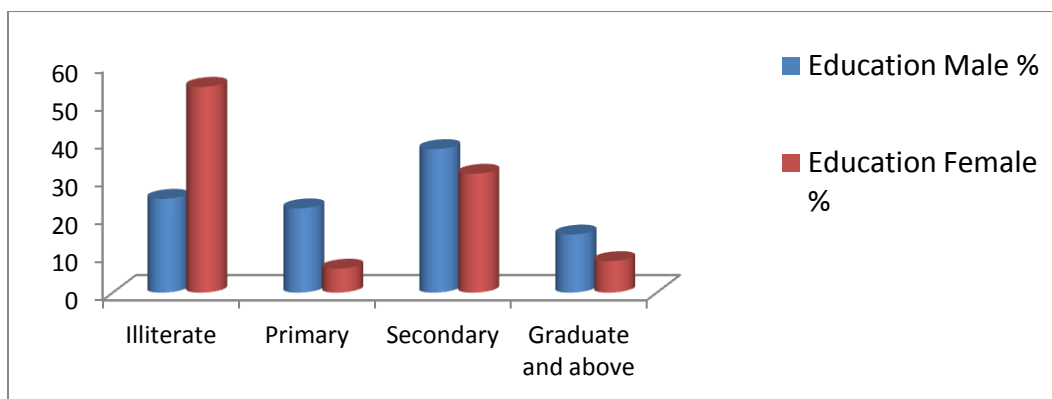
Majority of the respondents were males (88 %) with the remaining 12 % being females. The result is that most households are headed by men and are therefore central to the decision making on matters relating to gravel mining. Therefore, when it comes to solving the problems of mining their contributions could play an active role.



**Figure 3 :** The Gender and marital Status of the Respondents

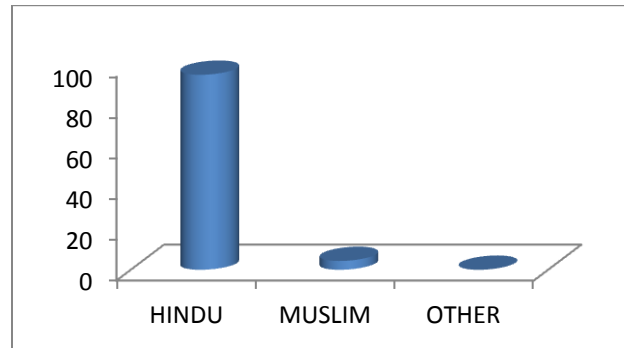
**Education Status of the Respondents:**

Education Status in Allahabad mining sites is depicted in fig 4. Total 54 % of men and 25 % of women respondents were illiterate and literacy level is very poor. 22 %, 38% and 15 % men are educated primary, secondary and graduate and level respectively. 6%, 31% and 8 % women are educated primary, secondary and graduate and level respectively.



**Figure 4: Education Status of the Respondents**

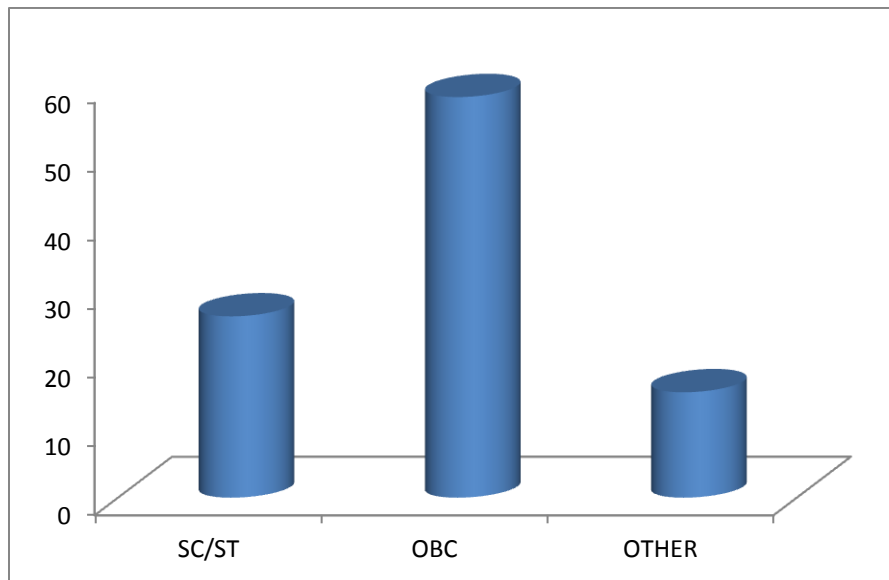
**Religious Status of the Respondents:** Religion of respondents in Allahabad district depicted in Fig 5. 96 % of respondents were Hindu and 4 % were Muslims. Other religious community is absent.



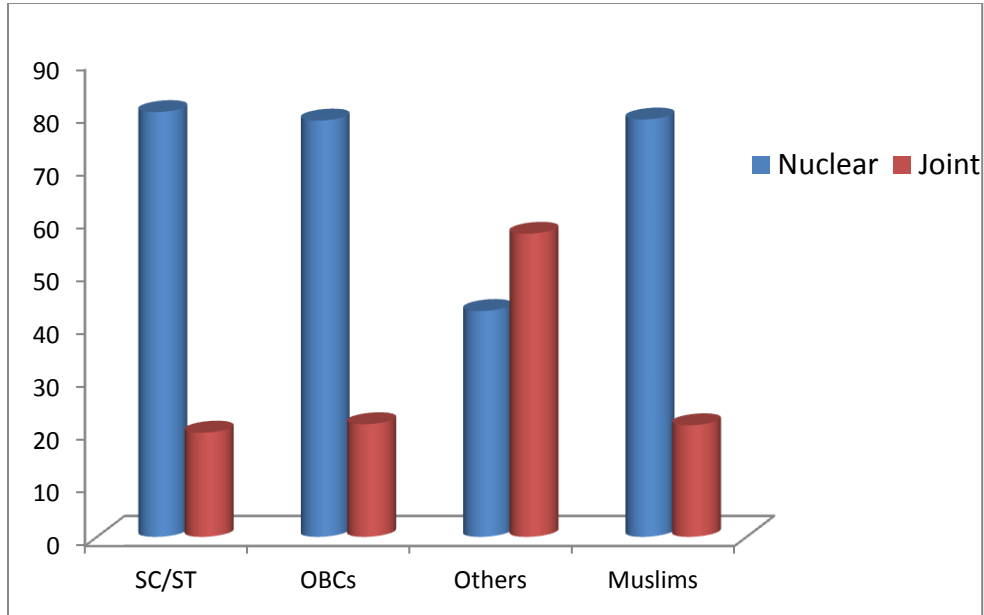
**Figure 5: Religion of Respondents**

**Caste Details of Respondents:**

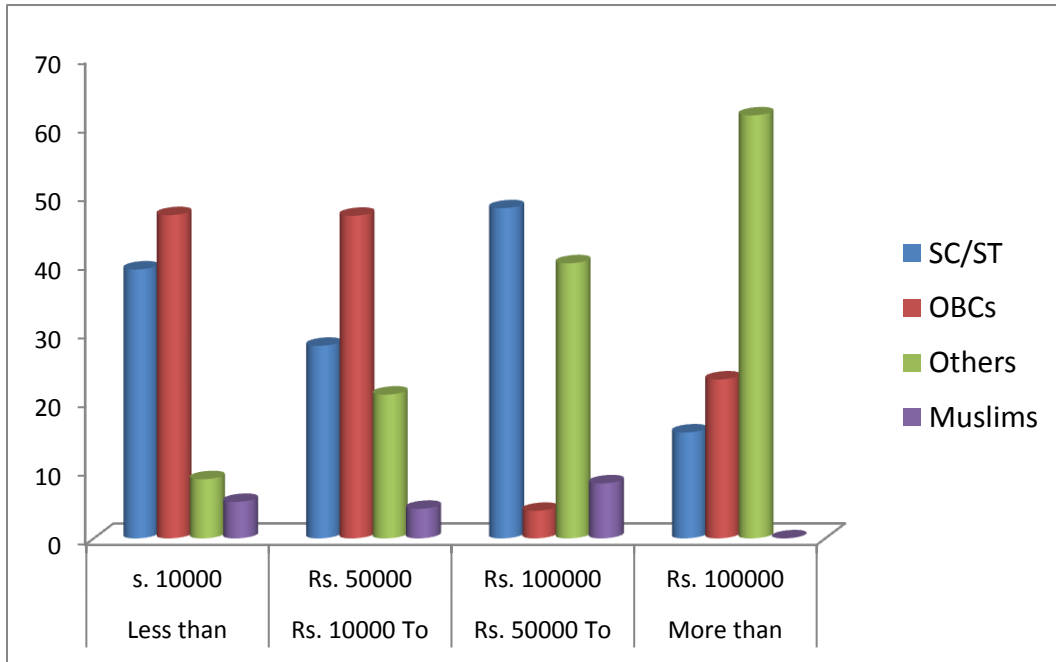
Caste status of Allahabad mining sited depicted in fig 6. 58 % of respondents belong to other backward community, 27% belong to Schedule caste/ Schedule tribe community and rest belong to other community, Brahmin, chhatriya etc. Family structure is nuclear type and 80 % of SC/ST , 79 % of OBC and Muslims and 43 % belonging to other caste’s family are nuclear type. 20 % of SC/ST , 21 % of OBC and Muslims and 57 % belonging to other caste’s family are joint type (Fig.7). Caste wise income is depicted in figure 8. SC/ST and OBC belongs to mainly lower income group, while other caste belong to higher income group.



**Figure 6: Caste Structure of Respondents**



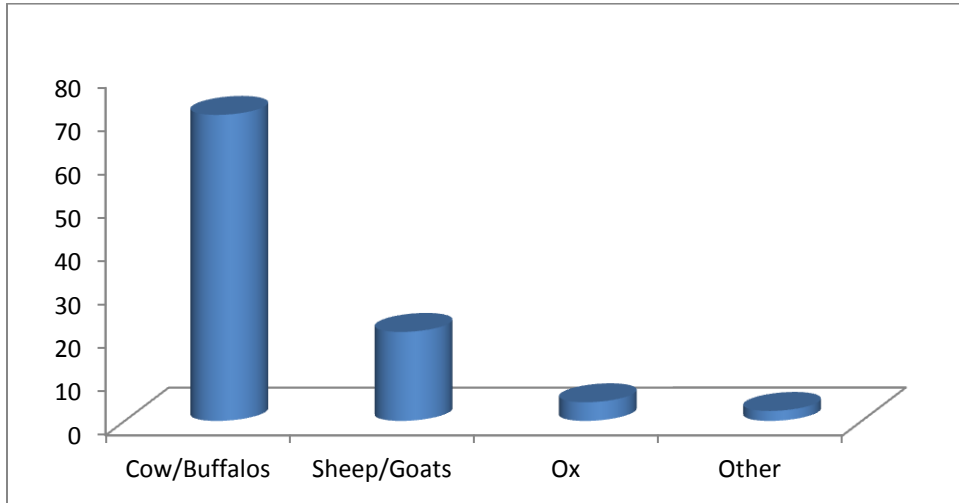
**Figure 7: Caste-wise types of family**



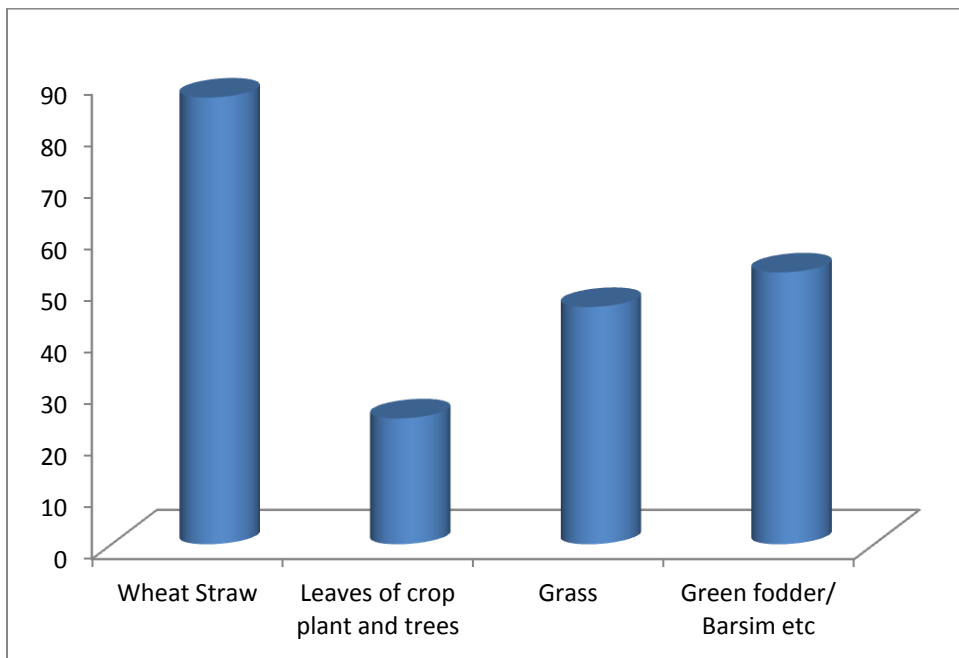
**Figure 8: Caste-wise annual Income**

### Dependency on Forest:

Local people depends on forest for their fodder supply for their livestock population and fuel wood etc. Livestock population are basically milk producers cow and buffalos (71 %), sheep and Goats (21%), Oxen (4%) and other (2%). However, a major portion of fodder demand is fulfilled by wheat straw. Live stock belonging to lower community depends on grazing in forest area and leaves of forest trees (Fig 10).

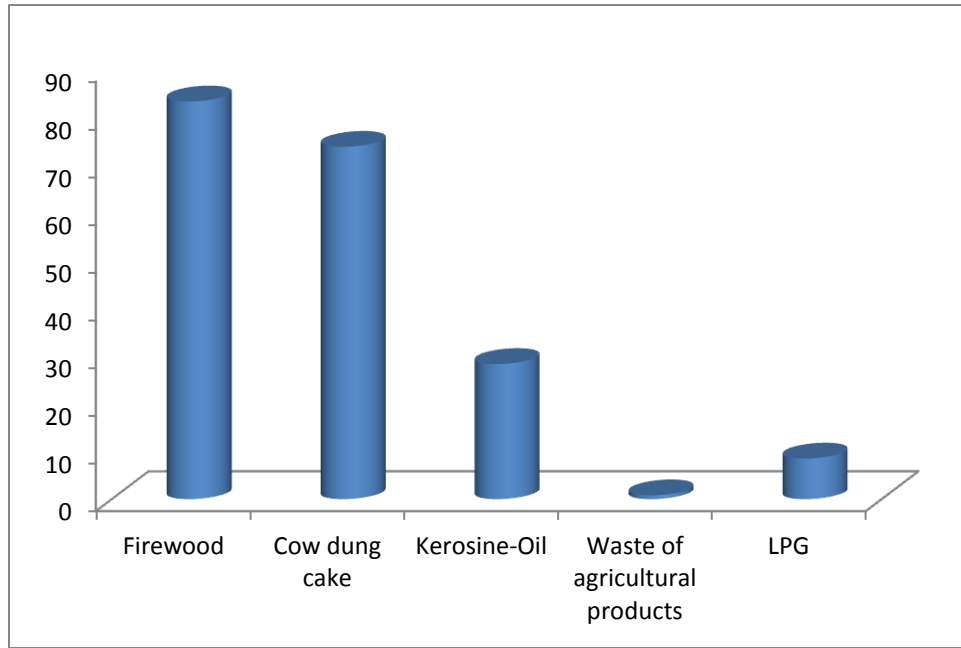


**Figure 9: Livestock population**



**Figure 10: Type of fodder used for livestock**

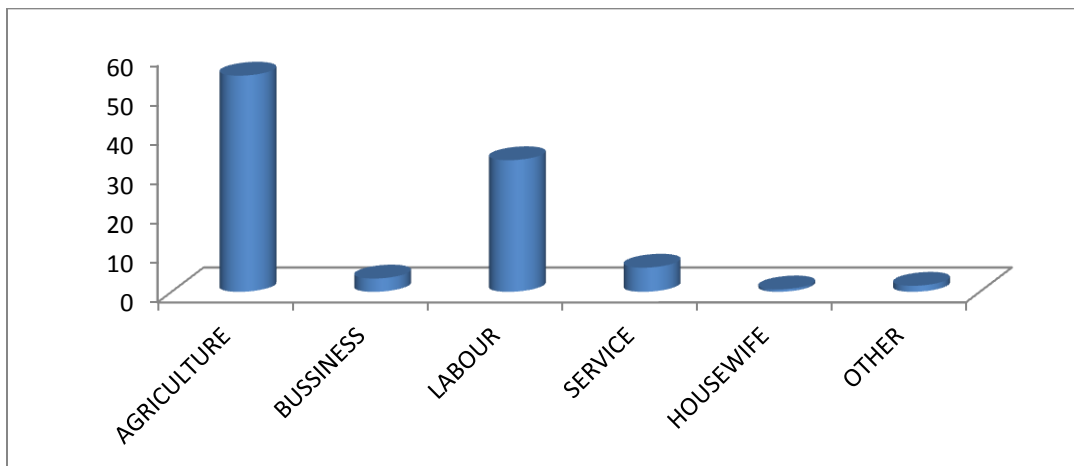
For fuel, mainly depends on firewood and cow dung cake. Only few are using LPG for their fuel demand (fig 11)



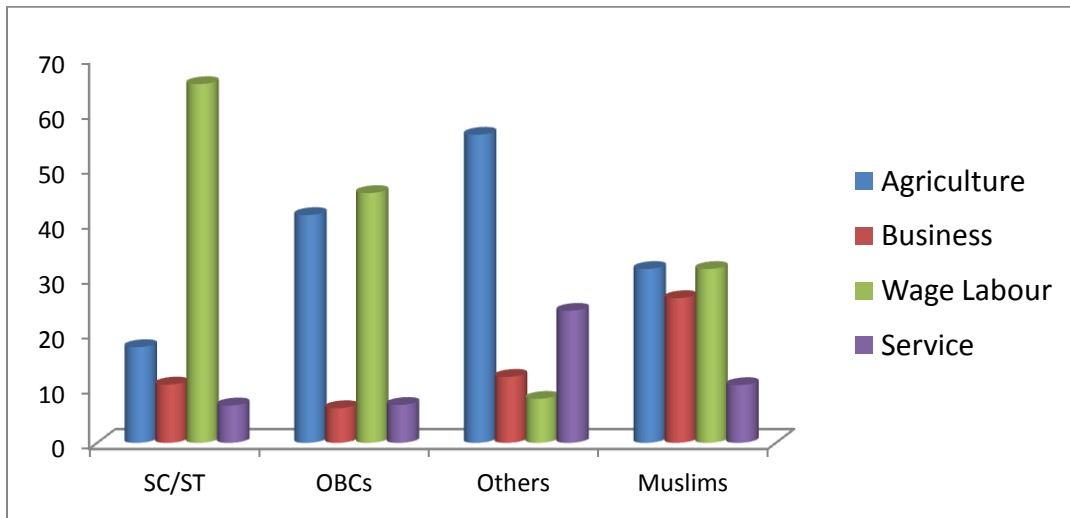
**Figure 11: Type of fuel used**

**Occupation of respondents:**

As shown in Figure 12, majority of the respondents (55 %) were engaged in farming as their main occupation. Their second most important occupation was laborer in mining (33.45 %). Only 6 % of the respondents were engaged in service and about 3.375 were engaged in business and trading and the remaining were engaged in other occupations.



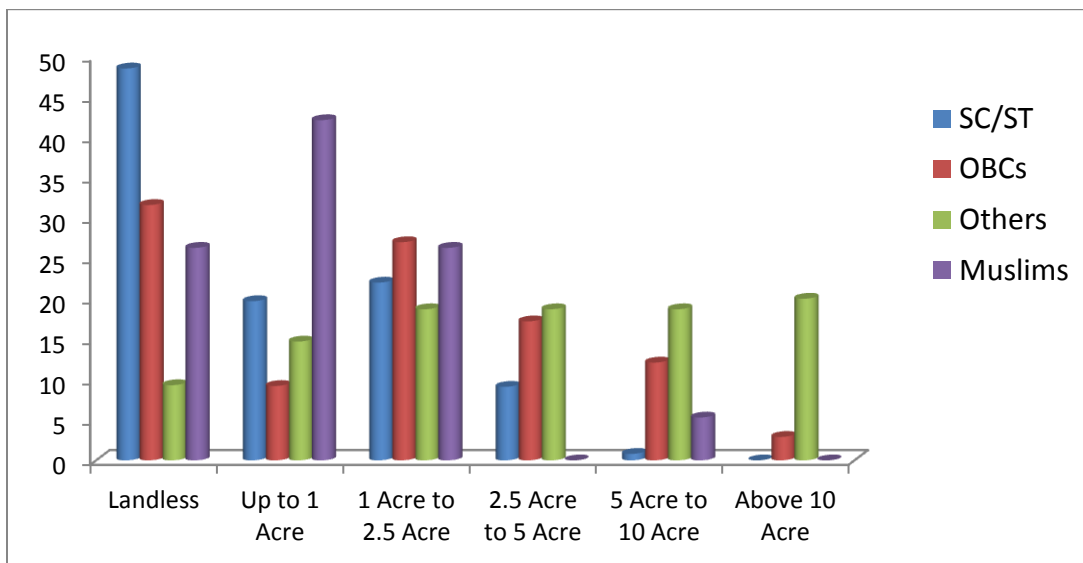
**Figure 12: Occupation of the Respondents**



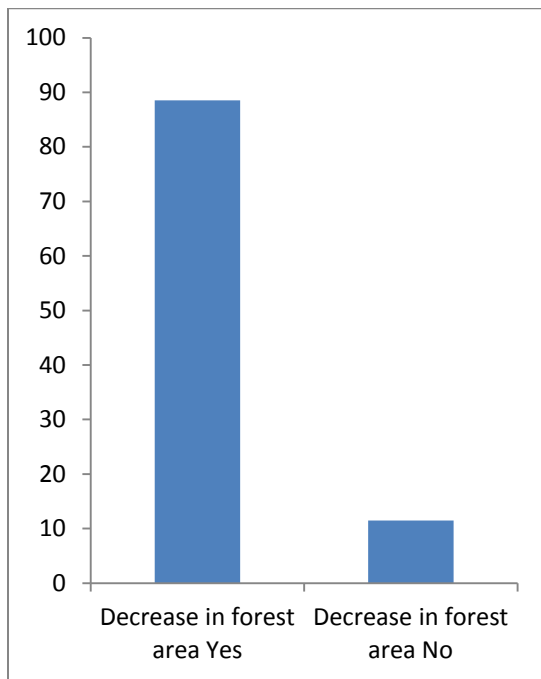
**Figure 13: Caste-wise Occupation of respondents**

Caste wise occupation is depicted in fig. 13. Among SC/ ST and OBC, main occupation is as labour in mining, whereas agriculture is main occupation for other case.

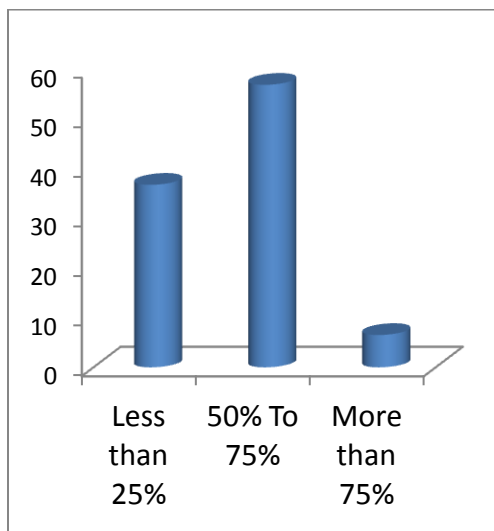
**Caste-wise Land holding Pattern:** Caste-wise Land holding is depicted in figure 12. SC/ST and OBC belong to landless category , whereas others have land holding pattern ranging from 1 Acre to above 10 Acre (Fig 14).



**Figure 14: Caste-wise Land holding Pattern**

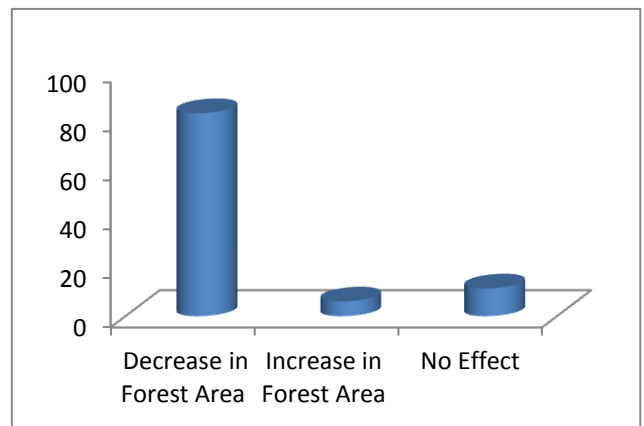


**Figure 15: Decrease in Forest in Area ?**



**Figure 16: Extent of Forest in Vicinity Area**

In vicinity of the area , the decrease in forest area is reported by major of respondents (89 %) Fig. 15. Extent of forest in vicinity is about 50 to 75 % as reported by 57% of respondents (Fig 16). About 83 % respondents accepted about adverse impact of mining on forest and according to them the forest area is decreased after mining. One of the most severe impacts of mining has been the changes it has brought to local land use patterns and concurrently its land scape. It has been found out that maximum land diverted for mining activity is either forest land, agriculture fields or common grazing land. According to about 6 % respondents, the forest area increased after the planting activities done by forest department (Fig 17).



**Figure 17: Impact of Mining in Area on Forest**

### Type of Mining in Allahabad :

Type of Mining in Allahabad is small-scale cluster type of mining, which was developed naturally in the course of decades of operation. In almost all cases, mining uses open pit or dredging mining methods with standard mining equipment. Opencast mining involves digging of pits and hillside excavation and is responsible especially for large-scale devastation of soils. Surface mining of silica is associated with the removal of vegetative cover combined with the stripping of topsoil, overburden and spoil materials. With such mines, the land surface over a considerable area is destroyed, and what is left behind may be unstable land, causing landslides, erosion, siltation, and polluted water. It disrupts ecosystems, scars the landscape, and destroys microbial communities resulting in degradation of forests. Such land is generally useless after the mining ends and may continue to cause environmental problems stretched beyond after the mine has been closed. These disturbances to the natural contour of the topography have repercussions, not only for those communities in the immediate vicinity but also for those inhabitants living in adjacent areas. About 95 % mining is open cast, only small portion is contributed by sand mining from river (Fig 18). Stone, gitti, boulder mining is 70 %, Silica sand contribute 20 % and rest is sand mining from river (Fig 19).

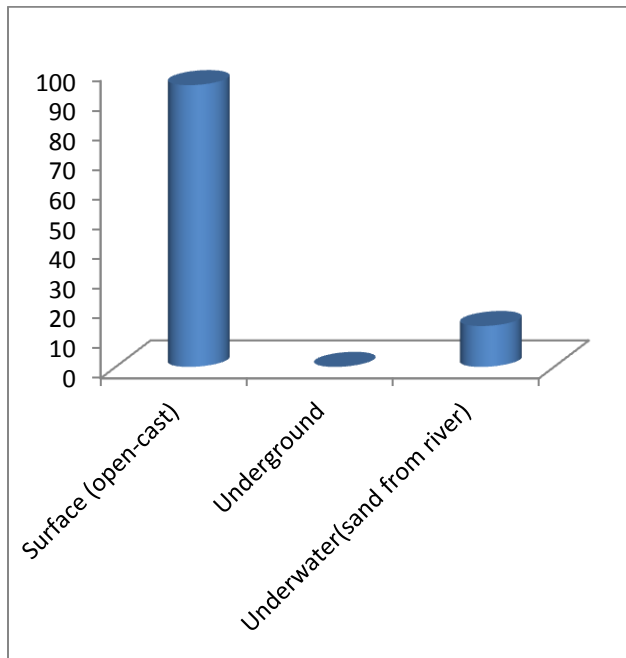


Figure 18: Type of Mining in Allahabad

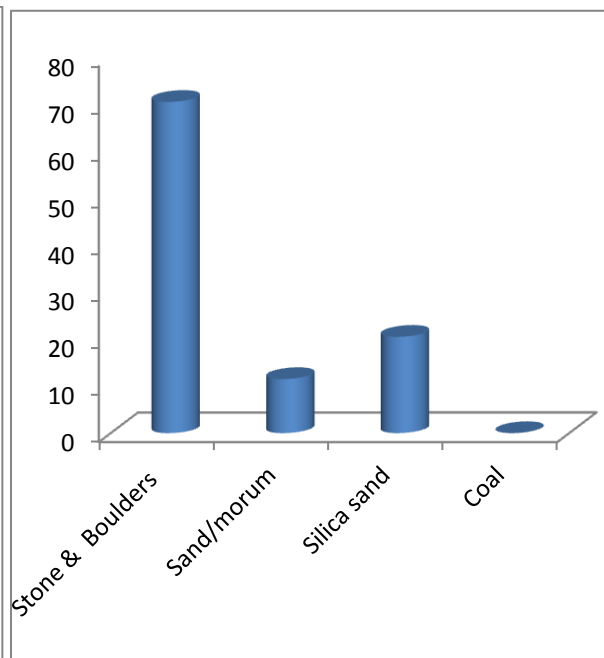
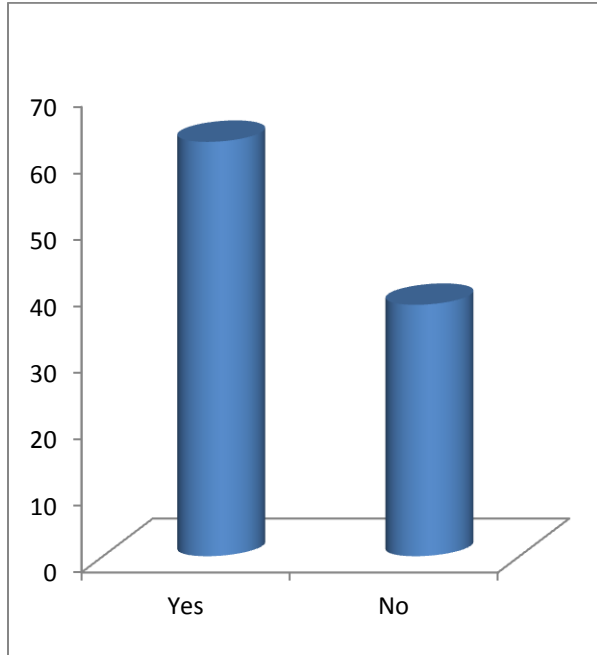


Figure 19: Type of Mining product

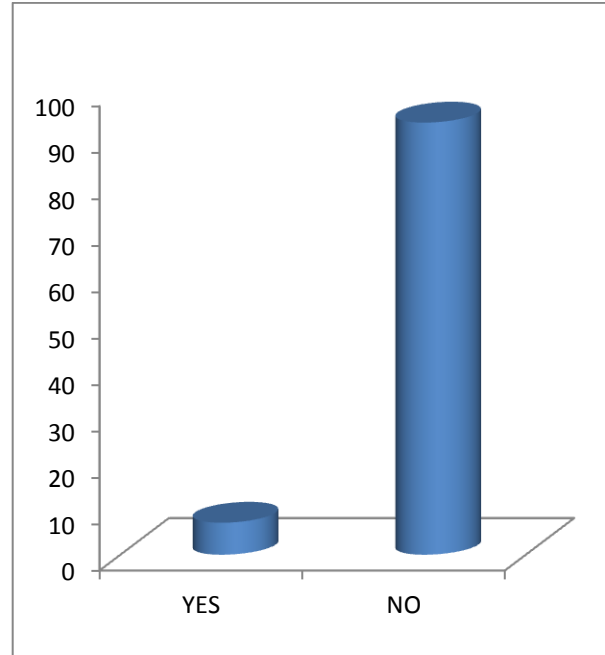


### Awareness about Forestry Programmes and Mining Policies:

Regarding the awareness about Forestry Programmes, most of the respondents (63%) were aware about the programmes run by Forest Department and 37% were unaware about the forestry programmes (Fig 20). About mining policies and rules regulation on 7%, a very little no, were aware and large populations were unaware (93%) (Fig 21).



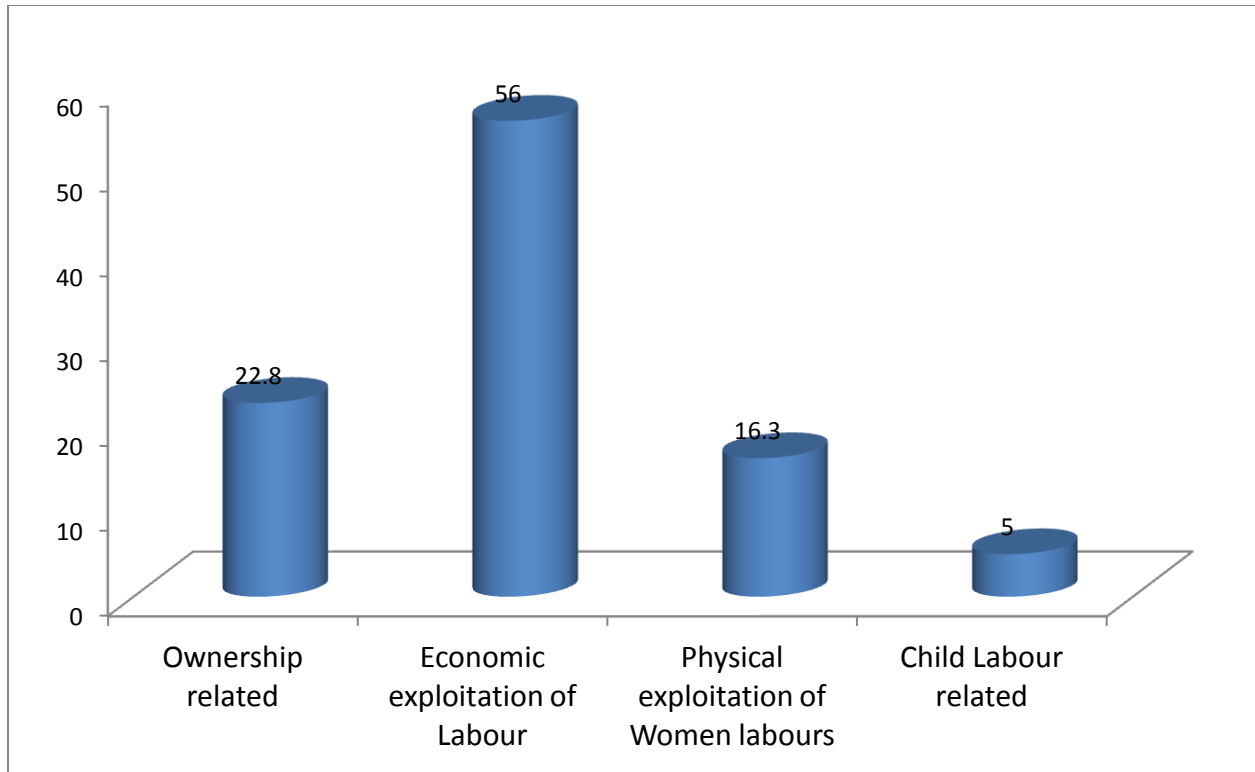
**Figure 20: Awareness about Forestry Programmes**



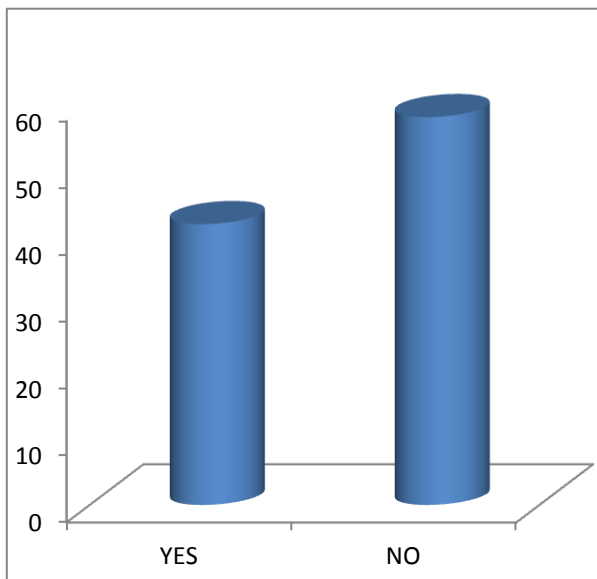
**Figure 21: Awareness regarding mining rules & policies**

### Dispute in Mining:

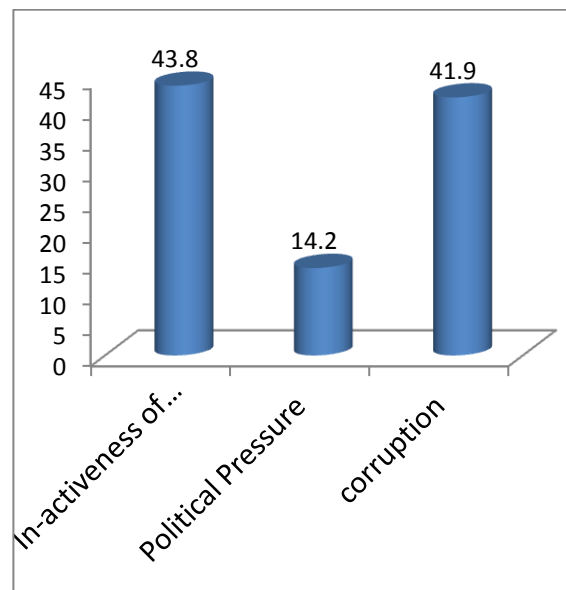
Mining is responsible for the generation of several disputes. Disputes related with exploitation of labour involved in mining was found about 56 %, ownership of mining area related disputes were about 23 %, problems related with physical exploitation of women labour also found a major reason of dispute (Fig. 22). Regarding illegal mining, about 42 % respondents responded in 'yes' and 58 % answered 'No'(Fig 23). For illegal mining area, 44 % respondents accused to in-effectiveness of administration, 20 % to corruption and 16% to political pressure for illegal mining (Fig 24).



**Figure 22: Type of Major Dispute in Mining**



**Figure 23: Is there any illegal mining?**



**Figure 24: Reason of illegal Mining**

### Land Use Preference after Closure of Mining:

Preference of post mining land use were questioned. In Allahabad district most of the respondents (34%) were preferred the development of a pasture land on mined land, whereas 25% and 24% of respondents were preferred to develop reserve forest and Bamboo plantations, respectively (Figure 25). According to 38% of respondents recommended to management of post mining land restoration by Village Panchayat Committee, while 36% recommended the management by Forest Department, rest of the respondents preferred by personal management or by the land owner (Figure 26).

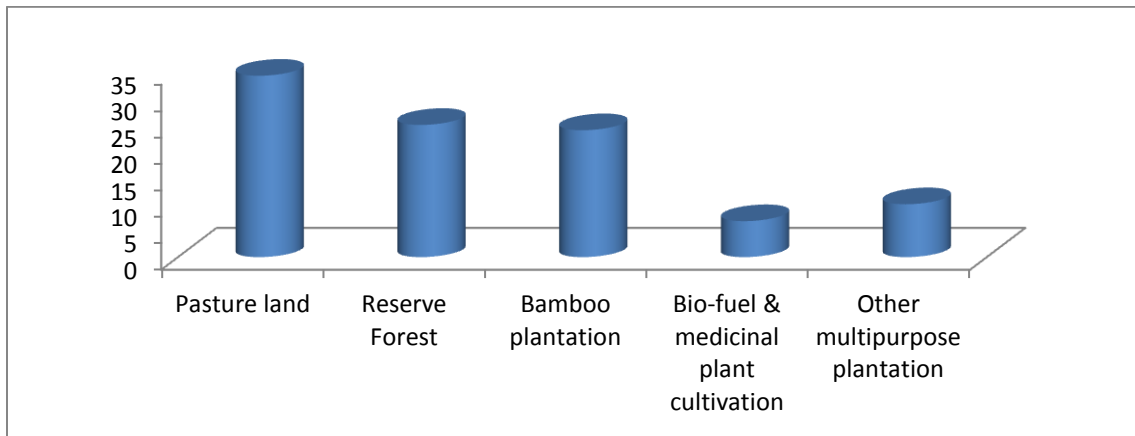


Figure 25: Preferred Post mining Land use

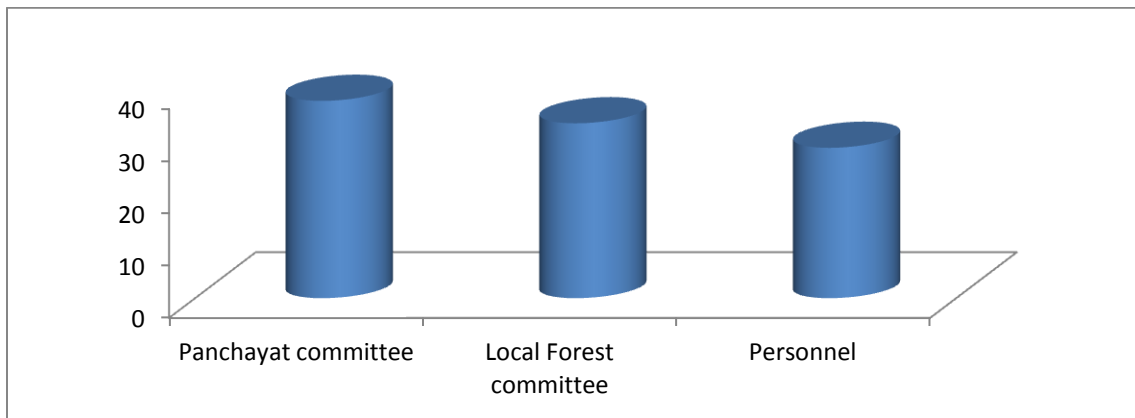


Figure 26: Management of Post- Mining Land Restoration

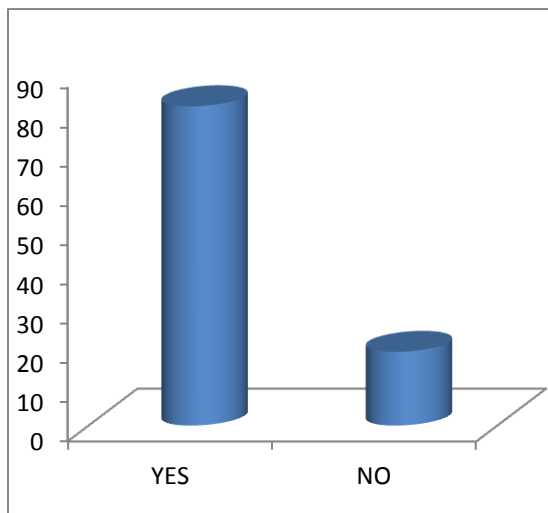
On issue of women safety, most of the respondents (42%) had different ideas, while about 36% recommended the requirement of training to the women for their safety. According to the 16%, women should be self dependent for their safety (Fig. 27).



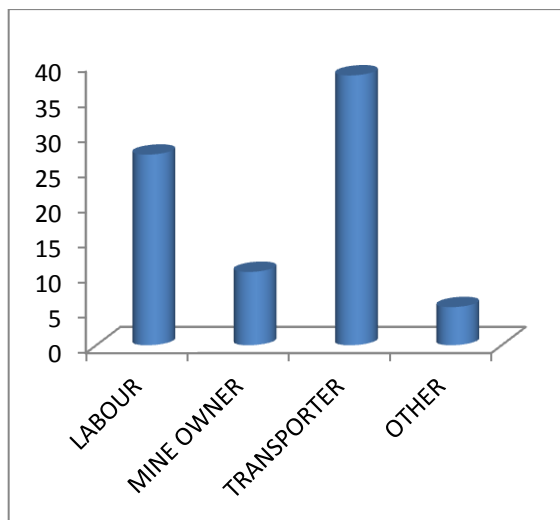
**Figure 27: Issues on women safety in mining**

**Dependency of Local Populace on Mining:**

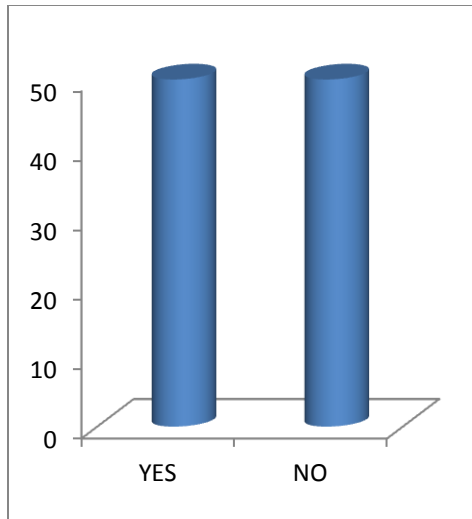
About 81% people were dependent on mining for their livelihood and 19% depends on other sources for their livelihood (fig 28). As far as type of dependency on mining was concerned, out of this 81%, about 27 % were involved as labourer, 38% as transporter, 10 % as mine owner and 6% were dependent on mining in various ways, either involved as middle man or selling etc (Fig 29). As far as effect of closure of mining on livelihood was concerned on the livelihood, about 50% respondents were getting affected (Fig 30), out of which, livelihood of 23 % of respondents were getting affected 100%, whereas 9% were affected 50 to 100% and 18% were getting affected by 50% (Fig 31).



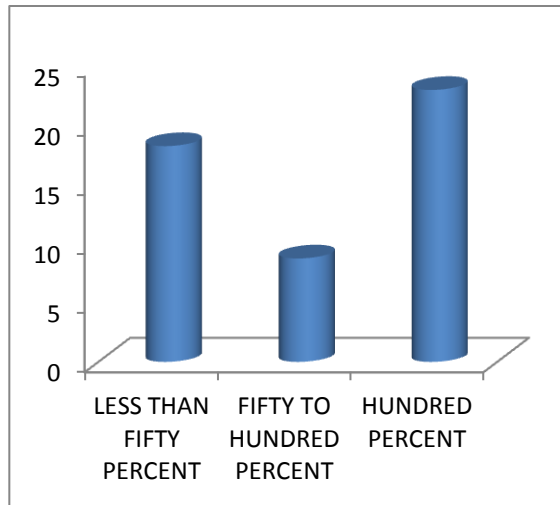
**Figure 28: Dependency on mining for livelihood**



**Figure 29: Type of dependency on mining for livelihood**

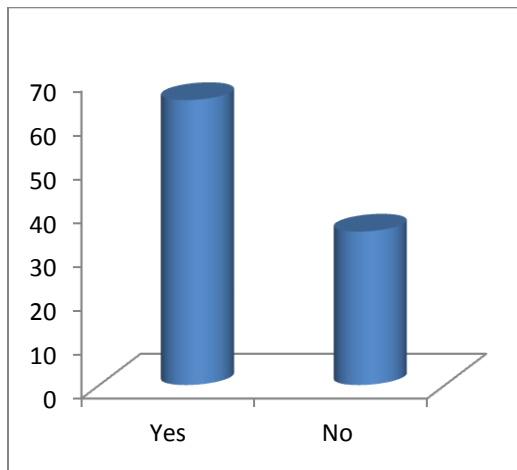


**Figure 30: Effect of closure mining**

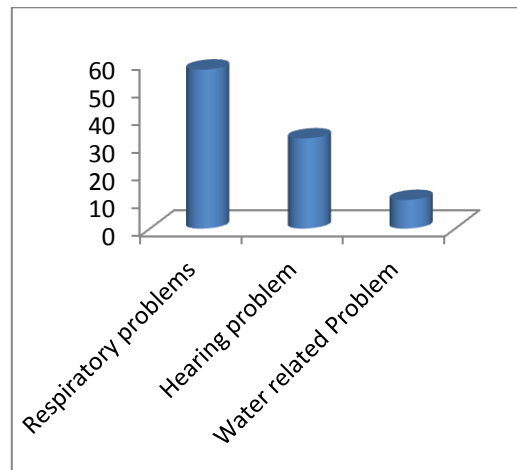


**Figure 31: Extent of effect on Livelihood activity on livelihood**

**Health Hazards and Safety Adopted:** About 65 % respondents responded that safety precautions were being adopted during mining, while 35% respondents denied about the safety precautions (Fig 32). In response to the health problems, about 57% mentioned that respiratory diseases were common in mine workers, while 33% and 10% mentioned hearing and water related problems, respectively (Fig 33).



**Figure 32: Safety Precautions adopted in Mining**



**Figure 33: Health related problems due to mining**

### Effect of Mining on Agriculture:

It was found out that the dust from mines contain enough silt that covers the nearby croplands forming silt coating thus affecting soil life system and crop productivity. It also contributes trace metal to the soil. The villagers complained movement of vehicle leads to generate more dust including which were getting deposited in the nearby field thus affecting the fertility of soil. High silt content of soil also led to affect the moisture content of soil which is very much vital for agricultural activity. It has been found out that the soil aeration mechanism of soil has been affected due to addition of mine overburden. Moreover the quality of soil was also adversely affected due to mining and situations is getting more adverse for cultivation, if these causative factors continue in upcoming days. It can be undoubtedly said that mining activity has definitely affected the quality of soil (both physical as well as chemical) thus affecting the productivity & livelihood of people. About 93% respondents accepted the adverse effect of mining on the agriculture (Fig 34). About 80% respondents accepted the decrease in agriculture production, while 12 respondents mentioned increase in crop production which was totally un-justified, but according to the, due to mining the rocks were removed from their land which increase the production (Fig 35)

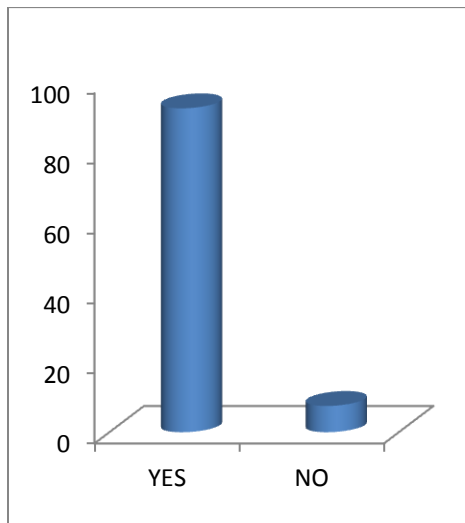


Figure 34: Effect of Mining on Agriculture

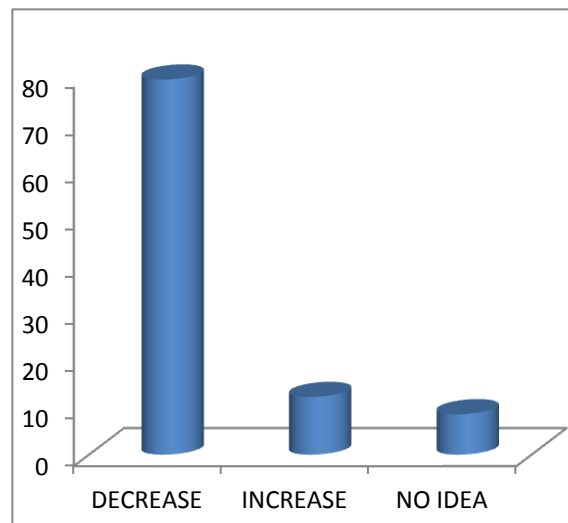
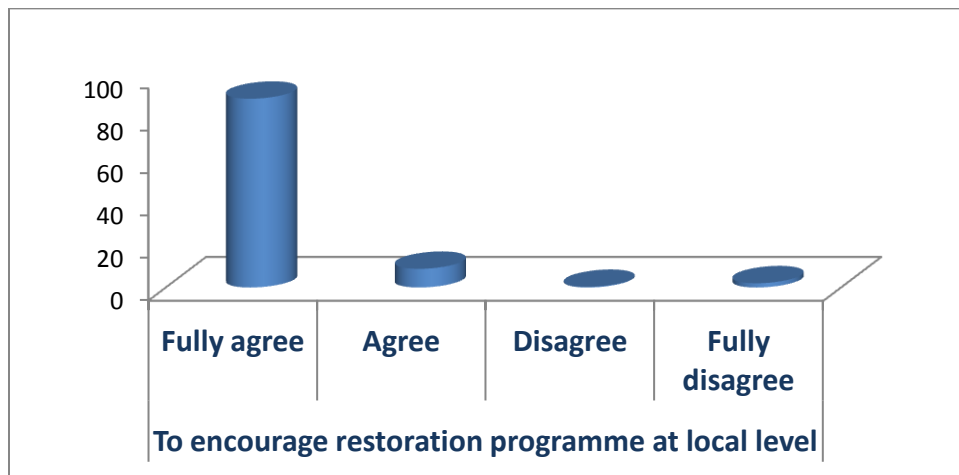


Figure 35: Effect of Mining on Agriculture production

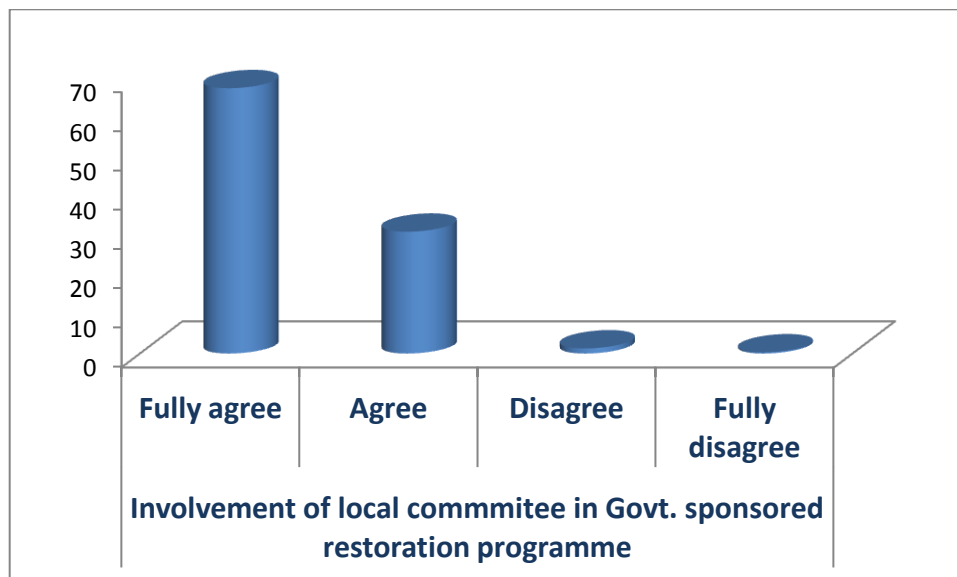
### Perceptions of Respondents about Restoration related statements:

Opinion of respondents about the restoration of the abandoned mined land were asked, they were fully agreed to the restoration programme at local level (89%), the involvement of

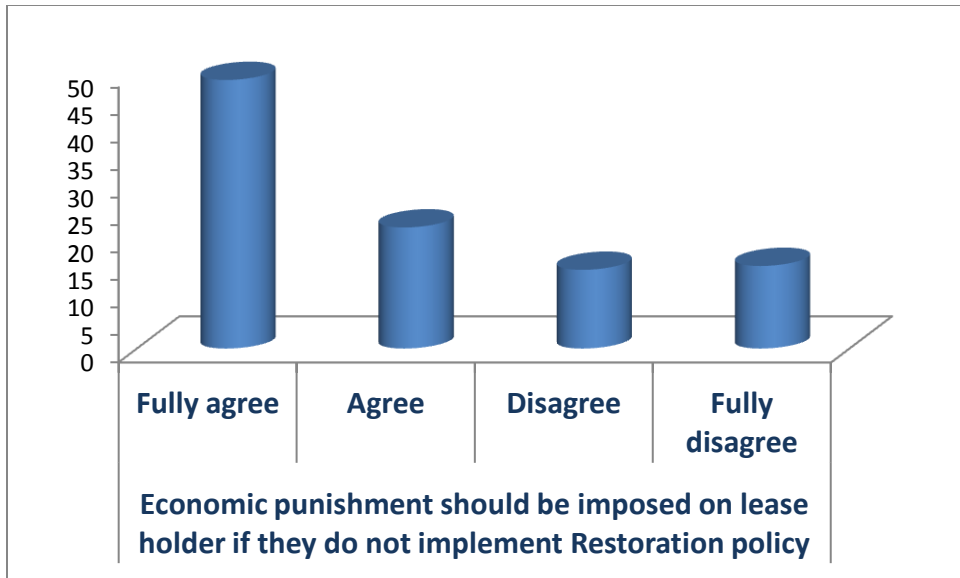
local committee in Government sponsored restoration programme (68%), and the implication of lease holder in case of violation of rules (49%). They showed their full disagreement (36 %) towards the promotion of restoration programme by NGO, Private sector level. According to them the non government body don't implicate the programme sincerely. However some respondents (32%) were fully agreed with the promotion of restoration programme by NGO, Private sector level, but they suggested the proper and regular monitoring of non government body by Government Authority (Fig. 36-39).



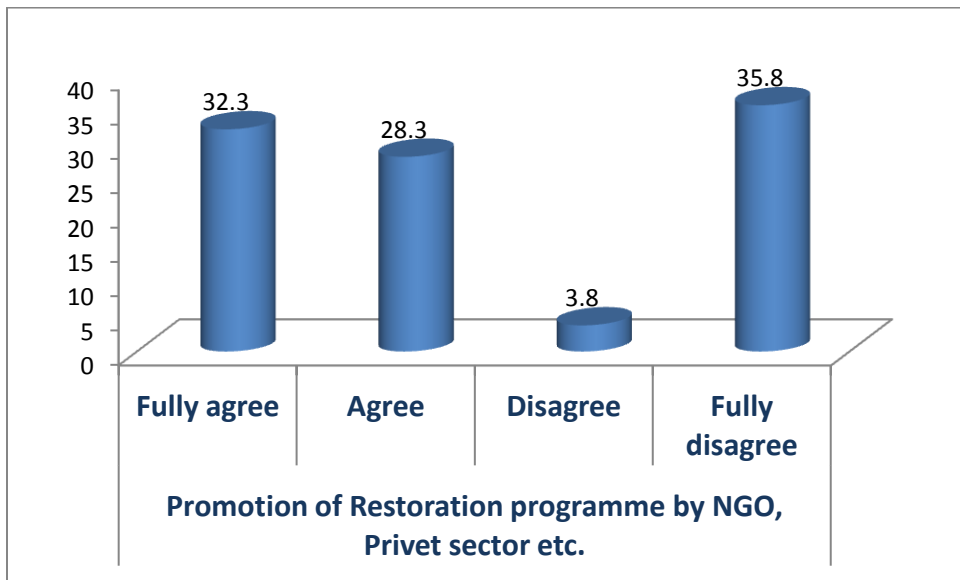
**Figure 36: Perceptions of respondents regarding the restoration programme at local level**



**Figure 37: Perceptions of respondents regarding the involvement of local committee in Government sponsored restoration programme**



**Figure 38: Perceptions of respondents regarding the implication of lease holder in case of violation of rules**



**Figure 39: Perceptions of respondents regarding the promotion of restoration programme by NGO, Private sector level.**



## **Participatory Rural Appraisal Study of Allahabad Mining Area:**

Major mining areas of Allahabad district (Meja, Koraon and Shankargarh) are backward area despite the rich mineral resources it has and despite the revenues the state receives from mining of these rich mineral resources. Mining is a capital intensive activity of the area having rather low level of other economic activities, e.g., agriculture, horticulture and forestry etc. The socio-economic profile of the local people was obtained from Participatory Rural Appraisal (PRA) tool which is depicted in Table 2 (Shankargarh) and Table 3 (Meja). PRA was conducted through meetings in nearby villages of mining area. The findings of the PRA study was depicted in Table 2 and 3. The majority of the people are Schedule Tribes involved in mining. Most of them are landless labourers and therefore, they are placed at the bottom of the social heap. This area is characterized by rigid caste and class hierarchies that are expressed in terms of hostility towards the lower castes, frequent violences, threats, robberies and assaults on women. Literacy level was very poor and most of the females were illiterate. Literacy level of males is only about 50%, that to only up to the school level. Government primary schools are functioning in the villages. Intermediate colleges are available only at Tahsil level. Most of the children (aged 5-12years) were school going. Since three-fourths of the mining area is rocky and therefore, is unfit for cultivation. So there is no possibility of viable agriculture or any existing agro-forestry system.

The local people rely mainly on the mining and exploitation of natural resources to develop their household economy. Mining in the area is providing employment directly or indirectly to people of the surrounding villages and their main occupation was mine labour in silica mines and in silica washing plants. Employment from mining was available throughout the year except in the rainy season when it is not conducive to mine due to the filling up of mining pits and shafts with water. Farming was an alternative source of income and bare subsistence. Land holding was very small or most of the land was fallow land. Paddy and wheat are main agriculture crops. Lack of water and irrigation facility was major constraints in farming. Since mining is predominantly manual and this being the main domain of men, the woman participation in mining activities was low. Economic strata of people lie in only one single class as all are under very poor group below poverty line. Monthly income of most of the respondents

was about Rs.8000-12000/family in Shankargarh and 9000-15000/family in Meja. Average number of family members was 6 to 7 per family. No adequate health facility was available in village areas. Though, there is a Government Primary Health Center (PHC) but it is lacking in adequate staff, emergency operation facilities and blood donation services. Housing is Kachcha type comprised of thatch and poles. The government has also enabled construction of some houses under the Indira Awas Yojna. Most of the water used for domestic purposes in the area is derived from wells or from unused mineshaft and therefore, the possibility of water contamination cannot be ruled out. For their recurrent subsistence needs of fuelwood and fodder, they mainly depend on nearby forests. The source of fuelwood is basically dry branches of *Butea monosperma*, *Acacia nilotica* and *Prosopis juliflora* etc. species from local forests and homemade cowdung cake, agricultural by product. The average requirement of fuel wood was about 1.5 to 2 quintals/month/family. The main livestock were cows and goats. Due to unavailability of agriculture products, the fodder sources for livestock are wild grasses, leaves of *Zizyphus sps.*, *Acacia sps.*, *Azadirachta indica*, *Carissa carandus* etc. and in dry seasons, leaves of *Pongamia pinnata* and *Butea monosperma* from nearby forest or by grazing and browsing in the forest area. This unrestricted collection of fuel wood, fodder and grasses is affecting the natural ecological restoration. Mango and Bamboo are the major species used for timber. Since agricultural land holding is small, most of them were not interested in adopting agro-forestry. Local people were not aware of the tree harvesting rules.

As far as reclamation of the site is concerned, they were generally found to be interested in it. They were aware about the afforestation programmes being run by Joint Forest Management Committees (JFMCs) formed by the State Forest Department under JAICA project. But these committees were not stated to be effective in their working. Some villagers were members of the Joint Forest Management Committees (JFMCs) constituted under these afforestation programmes. Fruits of *Emblica officinalis* , *Carissa carandus* and *Zizyphus mauritiana* were consumed by local people. Leaves of *Butea monosperma* (Dhak/Palash) were used for making country cups and plates by the local people for their daily sustenance. Leaves of *Diospyros melanoxylon* (Tendu) were also collected by the villagers through Forest Corporation. Despite a prosperous wealth of NTFPs in the adjoining forests, people were ignorant of their uses and values. There was no market of forest products in nearby areas. They were not satisfied with

the availability of fuel wood, fodder and timber. Therefore, people's daily basic requirements of fodder and fuel were highlighted as the two most important considerations among the respondents. So, the species meeting these two requirements were preferred by most of the people. Desi Babool (*Acacia nilotica*) was accepted by local people as a good source of tree based fodder, fuelwood and small timber. *Butea monosperma* (Palash) and *Acacia catechu* (Khair) are also accepted because of their economic importance of their NTFPs viz. lac cultivation and making cups and plates from Palash leaves and kattha extraction and other economic importance from Khair . The major species preferred by local people are the species like *Butea monosperma* (for lac cultivation and making cups and plates from its leaves), *Acacia nilotica* (fuelwood, fodder and timber), *Acacia catechu* (kattha and other economic importance), Pongamia (biofuel and fodder etc), *Prosopis juliflora* (fuel wood) and Aonla, Guava, Karaunda and Mango (fruits). Local people typically used several utility criteria to select trees for planting. Almost all tree species found in the nearby village areas were rated as basically preferred species for fodder as well as for firewood because of little or no viable choice available for timber yielding species in the study area. This is also support by the findings of Grundy *et. al.* (1993), Lykke (2000) and Kala (2007). As far as management of mining Area & its restoration was concerned, it was found that mining was not properly managed. Forest Department has been undertaking Plantations only in Forest Areas, mainly of Tree species. No Systematic Eco-restoration Efforts/Works in Mining Areas have been reported.

**Table 2:** Socio-Economic Study of Silica Mining Area of Shankargarh through Participatory Rural Appraisal Tool.

Sl. No.	Parameters	Local villages of Shankargarh area
1	Site specification	Silica mining area , three fourth area is rocky-calcareous
2	Location	Shankar Garh 40 kms from Allahabad on Allahabad-Banda Road
3	Community Composition	Majority of the people are Schedule Tribes known as Kol
4	Literacy	50 % Male have Primary education, most of the Female are Illiterate & 75% Children are School going .
5	Occupation	Main occupation is Mine Labourers & some Marginal Farmers.
6	Monthly income (Approx.)	Rs.8000-12000/family

7	Agriculture crop	Wheat & Paddy
8	Fuel wood: a) Source: b)Need:	a) Dry branches of Butea monosperma, Acacia catechu, Acacia nilotica & Prosopis juliflora etc. from local forest & Cow-dung Cake. b) 1.5 to 2 Quintals/month/family
9	Livestock	Cows ,Oxen, Buffaloes & Goats
10	Fodder source:	Wheat Straw, Wild Fodder Grasses, Leaves of Zizyphus sps. & Fodder trees viz. Acacia nilotica etc.
11	Timber species required for local use	Mango, Babul & Bamboo etc.
12	NTFPs used	Fruits of Aonla, Karonda & Ber; Leaves of Dhak (Butea monosperma) for making Cups & Plates & Leaves of Tendu.
13	Marketing of NTFPs	Making of Cups & Plates of Dhak (Butea monosperma) leaves. Marketing not developed. Tendu Leaves' Collection through Uttar Pradesh Forest Corporation.
14	Mining in Area	Silica Mining & Sand/Morum Mining by local Lease Owners/holders
15	Management of Mining area & Restoration	Mining not properly managed. Forest Department has been undertaking Plantations only in Forest Areas, mainly of Tree species. No Systematic Eco-restoration Efforts/Works in Mining Areas have been reported.
16	Choice of species preferred by Villagers	<i>Dalbergia sissoo</i> , <i>Butea</i> (for Lac cultivation & making Cups & Plates from its leaves), <i>Acacia nilotica</i> (timber, fuel, fodder & other economic importance), <i>Jatropha</i> , <i>Pongamia</i> (as Biofuel, Fodder etc.), <i>Prosopis juliflora</i> (as Fuel wood), <i>Bamboo</i> , <i>Aonla</i> , <i>Mango</i> , <i>Karaunda</i> , <i>Mahua</i> and <i>Guava</i> (as Fruit crop).

**Table 3:** Socio-Economic Study of Stone Mining Area in Meja, Allahabad

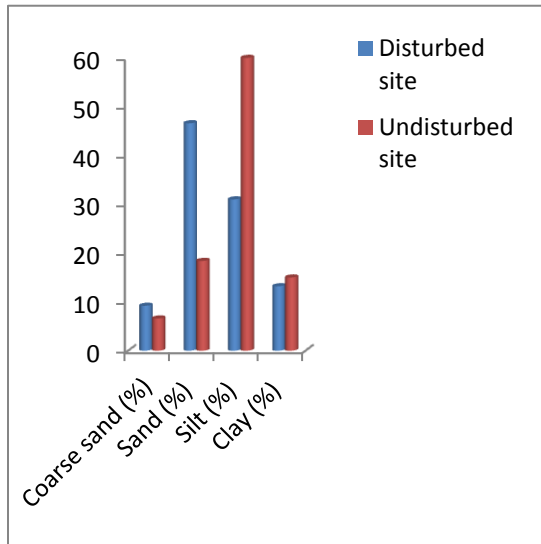
Sl. No.	Parameters	Local Villages of Meja Area
1	Site specification	Meja , Stony Plateau
2	Location	45 Kms from Allahabad
3	Community Composition	Mixed but majority of the people are SC/ST & OBC
4	Literacy	About 50 % Male have Primary Education, most of the Female are Illiterate, 75% Children are School going.
5	Occupation	Mine Labourers, Transporters, Farming & Services etc.
6	Monthly income (Approx.)	Rs.9000-15000/family
7	Agriculture crop	Wheat & Paddy
8	Fuel wood: a) Source: b)Need:	a) Dry branches of trees from local forest & Cow-dung cake b) 1.5 to 2 Quintals /month/family

9	Livestock	Cows ,Oxen, Buffaloes & Goats
10	Fodder source:	Agricultural Bye-Products (Wheat Straw etc), Wild Grasses of nearby forest, Leaves of Zizyphus sps., Acacia sps., Neem & Carissa carandus etc.
11	Timber species required for local use	Mango, Bamboo, Babul & Shisham etc.
12	NTFPs used	Tendu Leaves' Collection through Uttar Pradesh Forest Corporation.
13	Marketing of NTFPs	
14	Mining in Area	Stone Mining & Sand/Morum Mining by local Mine Owners & Lease Holders. Land areas prone to illegal mining
15	Management of Mining Area & Restoration	Mining not properly managed. Forest Department has been undertaking Plantations only in Forest Areas, mainly of Tree species. No Systematic Eco-restoration Efforts/Works in Mining Areas have been reported.
16	Choice of species preferred by Villagers	Shisham, Teak, Medicinal Plant species, Mango & Bamboos etc.

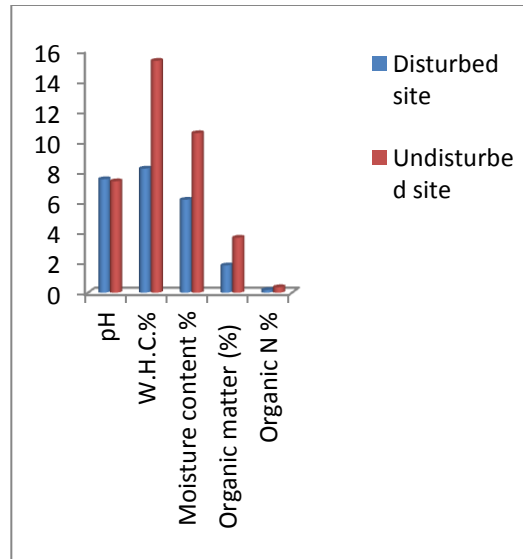
### **Impact of Mining on Flora and Soil Characteristics:**

#### **Soil parameters of Meja Stone Mining-Allahabad:**

It is essential to determine the soil status in the area to identify the impacts of mining on soil quality. Accordingly, a study of assessment of the soil quality has been carried out. It has been found out that organic matter and Nitrogen content content in all the soil samples collected from mining site are found to be less with comparison to the undisturbed. Generally it can be said that the organic matter and Nitrogen of soil in this area has been affected due to addition of inorganic matters brought in by silts and runoff from the mines area . In all the samples it has been found out that increased solution of stable lechates of iron has affected the fertility of soil. Similarly the PH of the soil is slightly acidic. The moisture content in mining area soil is not found to conducive for agricultural activity. Water Holding Capacity and Moisture content of soil of mining area is less in comparison to undisturbed area (Fig 41) which is mainly due to the coarse sand and sandy part in mining area sample which contributes 56% (Fig. 40).



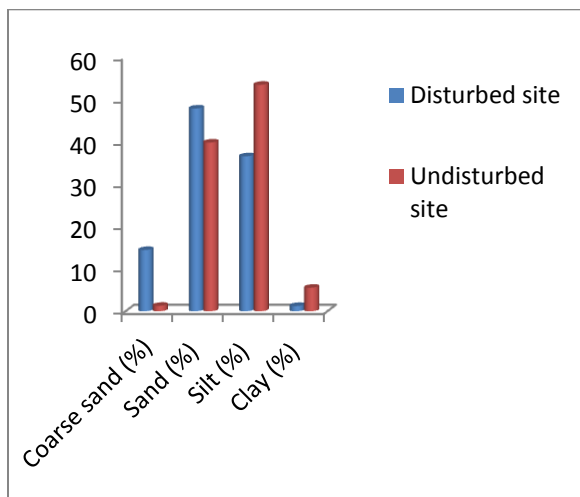
**Figure 40: Soil Texture Analysis**



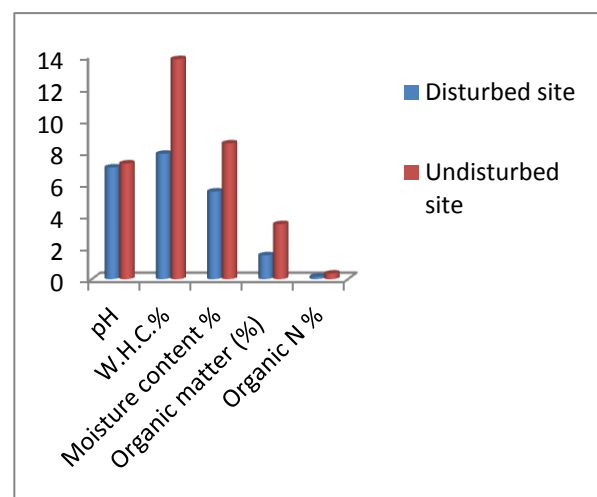
**Figure 41: Soil physico-chemical Parameters**

**Soil parameters of Silica Mining Site at Shankargarh, Allahabad :**

Texture analysis and physico-chemical parameters of Soil sample of Shankargarh mining area are depicted in Fig 42 and Fig43 respectively. Observations, similar to stone mining area in Meja, were observed in this case also. Samples from mining site was low in moisture retention capacity, organic carbon and nitrogen. Coarse sand parts contributed 62% of mining area sample.



**Figure 42: Soil Texture Analysis**



**Figure 43: Soil Physico-Chemical Parameters**

## Impact of Silica Mining on Flora :

Vegetation of the area is dry deciduous type. Flora study was conducted for both type of mining being conducted in Allahabad i.e. Silica mining and Stone & boulder mining. In 100 meter range mostly herbs were found, trees and shrubs were absent due to their felling for the mining process. In case of silica mining, total 27 species were reported in undisturbed site (100 m from mining site) whereas in mining site only five species were reported (Table 4 and 5). Jaccard's Index of similarity was 0.54; it means biodiversity was affected by 0.26. All species present at mining site were also reported at undisturbed site.

**Table 4: Impact of Silica Mining on vegetation at Allahabad at Undisturbed Site (100 m from mining site).**

S.No.	Species	Comman name	Family	Frequency	Density	RF	RD	IVI
1	<i>Ipomoea pestigridis</i>	Ghiabati	Convolvulaceae	100	216.67	3.7	4.78	8.48
2	<i>Parthenium hysterophorus</i>	Chatak ch&ni	Asteraceae	100	250	3.7	5.51	9.21
3	<i>Corchorus aestuans</i>	Conch	Tiliaceae	100	233.33	3.7	5.14	8.85
4	<i>Tribulus terrestris</i>	Gokhuru	Zygophyllaceae	100	323.33	3.7	7.13	10.83
5	<i>Elytraria acaulis</i>	Dasmori	Acanthaceae	100	163.33	3.7	3.6	7.3
6	<i>Solanum xanthocarpum</i>	Katai	Solanaceae	100	260	3.7	5.73	9.43
7	<i>Cyperus compressus</i>	Mothi	Cyperaceae	100	133.33	3.7	2.94	6.64
8	<i>Termnus labialis</i>	Mashoni	Fabaceae	100	200	3.7	4.41	8.11
9	<i>Phylenthus fraternuss</i>	Jaramla	Euphorbiaceae	100	146.67	3.7	3.23	6.94
10	<i>Xanthium indicum</i>	Chhota Dhatura	Asteraceae	100	33.33	3.7	0.73	4.44
11	<i>Eclipta alba</i>	Bringhraj	Asteraceae	100	310	3.7	6.83	10.54
12	<i>Euphorbia thymifolia</i>	Choti Dudhi	Euphorbiaceae	100	306.67	3.7	6.76	10.46
13	<i>Sida cordata</i>	Farsh booti	Malvaceae	100	313.33	3.7	6.91	10.61
14	<i>Tridax procumbens</i>	Gujrati	Asteraceae	100	220	3.7	4.85	8.55
15	<i>Heteropogon contortus</i>	Parua	Poaceae	100	20	3.7	0.44	4.14
16	<i>Gomphrena celosiooid es</i>	Amarnath	Amaranthaceae	100	133.33	3.7	2.94	6.6
17	<i>Indigofera cardifolia</i>	Nila bari	Fabaceae	100	93.33	3.7	2.06	5.76
18	<i>Digitaria adsedense</i>	Kreb grass	Poaceae	100	120	3.7	2.65	6.35
19	<i>Alpuda mu tica</i>	Banjuri	Poacea e	100	116.67	3.7	2.57	6.28
20	<i>Achyranthes aspera</i>	Chitchita, latjira	Amaranthaceae	100	110	3.7	2.42	6.13
21	<i>E. nummularious</i>	Safed Shankhpushpi	Convolvulaceae	100	153.33	3.7	3.38	7.08
22	<i>Evolvulus alsinoides</i>	Shankhpushpi	Convolvulaceae	100	110	3.7	2.42	6.13
23	<i>Vernonia cinerea</i>	Sahadebi	Asteraceae	100	80	3.7	1.76	5.47

24	<i>Aristida adscensionis</i>	Lamp	Poaceae	100	86.67	3.7	1.91	5.61
25	<i>Dactyloctenium aegyptium</i>	Makra	Poaceae	100	66.67	3.7	1.47	5.17
26	<i>Euphorbia hirta</i>	Dudhibel, Chara	Euphorbiaceae	100	160	3.7	3.53	7.23
27	<i>Cynodon dactylon</i>	Dub	Poaceae	100	176.67	3.7	3.89	7.6

**Table 5: Impact of Silica Mining on vegetation at Allahabad at disturbed Site (mining Site).**

S.No.	Species	Common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Evolvulus alsinoides</i>	Shankhpushi	Convolvulaceae	100	113.33	21.42	24.28	45.71
2	<i>Euphorbia hirta</i>	Dudhi bel	Euphorbiaceae	66.67	16.66	14.28	3.57	17.86
3	<i>Sida cordata</i>	Farsh booti, Gulsakari	Malvaceae	100	50	21.42	10.71	32.14
4	<i>Boerhavia diffusa</i>	Gadpurna, Punarnava	Nyctaginaceae	100	76.66	21.43	16.42	37.85
5	<i>Cynodon dactylon</i>	Dub	Poaceae	100	210	21.42	45	66.43

In case of stone mining in Allahabad, total 15 species were reported in undisturbed site (100 m from mining site) whereas in mining site eight species were reported (Table 6 and 7). Jaccard's Index of similarity was 0.533; it means dissimilarity is 0.277. All species present at mining site were also reported at undisturbed site.

**Table 6: Impact of Stone Mining on vegetation at Allahabad at undisturbed Site (100m away from mining Site).**

S.No.	Species	common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Sacchrum spontaneum</i>	Kans grass	Poaceae	100	1.00	6.67	0.42	7.08
2	<i>Megathyrus maximus</i>	buffalograss	Poaceae	100	5.67	6.67	2.37	9.03



3	<i>Pennisetum pedicellatum</i>	Deenanath Grass	Poaceae	100	9.67	6.67	4.04	10.71
4	<i>Cenchrus ciliaris</i>	Anjan	Poaceae	100	13.33	6.67	5.57	12.24
5	<i>Acacia nilotica</i>	Babool	Mimosaceae	100	12.67	6.67	5.29	11.96
6	<i>A. auriculiformis</i>	Sonjhari	Mimosaceae	100	12.33	6.67	5.15	11.82
7	<i>Penicum maximum</i>	Guinea grass	Poaceae	100	21.00	6.67	8.77	15.44
8	<i>Prosopis sp.</i>	Kathaila	Mimosaceae	100	20.67	6.67	8.64	15.30
9	<i>Aristida histrix</i>	Lampa grass	Poaceae	100	28.00	6.67	11.70	18.37
10	<i>Chrysopogon fulvus</i>	Dhavlu	Poaceae	100	32.00	6.67	13.37	20.04
11	<i>Eulaliopsis binata</i>	Bagai	Poaceae	100	13.00	6.67	5.43	12.10
12	<i>Heteropogon contortus</i>	Churanth	Poaceae	100	29.33	6.67	12.26	18.92
13	<i>Vetiveria zizanoides</i>	Khus	Graminae	100	23.00	6.67	9.61	16.28
14	<i>Boerhavia diffusa</i>	gadah-punna	Nyctaginaceae	100	5.67	6.67	2.37	9.03
15	<i>Convolvulus pluricaulis</i>	shankhapushpi	Convolvulaceae	100	12.00	6.67	5.01	11.68

**Table 7: Impact of Stone Mining on Vegetation at Allahabad At Disturbed Site**

S.No	Species	common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Sacchrum spontaneum</i>	Kans	Poaceae	100	4	13.64	9.68	23.31
2	<i>Penicum maximum</i>	Guinea grass	Poaceae	100	5	13.64	12.10	25.73
3	<i>Eulaliopsis binata</i>	Bagai	Poaceae	100	5	13.64	12.10	25.73
4	<i>Vetiveria zizanoides</i>	Khus	Graminae	100	3	13.64	7.26	20.89
5	<i>Crysopogon fulvus</i>	Dhavlu	Poaceae	100	8	13.64	19.36	32.99
6	<i>Boerhavia diffusa</i>	gadah-punna	Nyctaginaceae	66.67	1.67	9.09	4.03	13.12
7	<i>Convolvulus pluricaulis</i>	shankhapushpi	Convolvulaceae	66.67	4	9.09	9.68	18.77
8	<i>Heteropogon contortus</i>	Churanth	Poaceae	100	10.67	13.64	25.81	39.44

One of the most severe impacts of mining has been the changes it has brought to district land use patterns and concurrently its land scape. It has been found out that maximum land diverted for mining activity is either forest land, agriculture fields or common grazing land. Forests have especially tolerated the impact of mining. Mining has considerable effect on land, air and water. Primarily, it causes loss of biodiversity, soil pollution and land degradation (Pandey and Kumar, 1996, Dubey, 2010, Dubey and Dubey, 2013). It also results to clearing of vegetation, reduces essential nutrients and organic matter of the soil, reduces biological activity and decreases productivity of the soil (Pandey and Kumar, 1996). Mining activities directly or indirectly affect both the living things and non-livings things through the physical and chemical modification of the soil environment (Ratcliffe, 1974).

**Suggestions/ Recommendations of Brainstorming Session with Stakeholders held at Allahabad District:**

A stakeholder meeting was conducted in Allahabad covering all important issues related to Sanction of Mining Lease, Disputes related to Land, Mine Workers & Wages etc, Mining Policy, Rules & Regulation related issues, Social & Ecological Issues and other miscellaneous issues specified by stake holders. Stakeholders participated were concerned with mining from Forest Department, Mining Department, Mining Lease Owner, Mining Laborer, local people, scientists etc. Issue were discussed in detail and following suggestion and Recommendations:

- Mining area should be divided into different mining segments/sectors. If mining is over in one segment/sector, it will be readily available for post mining Land reclamation & Eco-restoration. Mining should be done segment/sector wise.
- Present State Level Ordinance to be removed. The Ordinance before 2010 should be restored.
- Quarterly Mining Data/Information to be submitted to Forest Department.
- Pollution Control Measures (PCM) to be followed as large Crop & Forest areas nearby Mining areas are severely damaged. Forest Department should be involved for Pollution Control Measures (PCM).

- Mining is a threat for Fauna as the ground nearby mining area becomes hard/cemented due to compaction & pollution. So, species like turtles, which lay their eggs in Soil/Ground, may face threat.
- Environment Clearance is too lengthy process & time limit should be fixed for Environment Clearance.
- Natural Water Resources not to be polluted due to mining. A suitable water drainage system should be developed
- Zonal Mining Areas to be defined & Environment Clearance for these Mining Zones to be sought, so that more mining entrepreneurs turn up spontaneously & voluntarily.
- Mining depth to be reduced from presently permissible limit of 35 m.
- All labourers engaged in Mining areas to be registered, so that crime trend is reduced. Their education levels to be augmented. Initial step is to improve the Level of Primary Schools in mining areas' locality.
- Whatever Revenue is earned, a District Level Committee (DLC) should be formed to suggest, formulate & implement developmental activities. Revenue so earned can fulfill the basic requirements or for development of area.
- The meetings with different stakeholders can be arranged & held frequently for their valuable suggestions.

## **Mirzapur District**

### **Socio-Economic Profile**

**&**

### **Impacts of Mining on Vegetation & Soil Parameters**

#### **DISTRICT –MIRZAPUR**

**Location-** District lies in the south of Uttar Pradesh, bounded by Sant Ravidas Nagar (Bhadohi) & Varanasi in the north, Ch&auli in the east, Allahabad in the west & Sonbhadra in the south.

**Topo sheet No.-** 63K, 63L, 63O, 63P

**Latitude-** 24<sup>0</sup>06<sup>0</sup>, N - 25<sup>0</sup>15<sup>0</sup> N

**Longitude-** 82<sup>0</sup>04' E - 83<sup>0</sup>13'39" E

**Area-**4521 sq. Km

**Geological Setup** -The area consists of Kaimur Sandstone & alluvium. Geological map of the district is given as Figure 3.

**Major Rivers-** Major river of district is Ganga

**Minerals** - Mining is a major activity of the region with open cast stone, Bolder, Slab stone mining. Many crusher units are running in district. Building stones, Road ballast, Bajri, Bolder, Sand & morum.

**Revenue from major & minor mineral (2013-2014)-** Rs 1321.22 Lakhs

**Mining Area in Mirzapur :** Major mining areas of district is as below:

- Sand /Morum Mining site: Ganga River Zone
- Stone Mining site : Lalganj, Chunar, Madihan & Sadar Tahasil of Mirzapur.



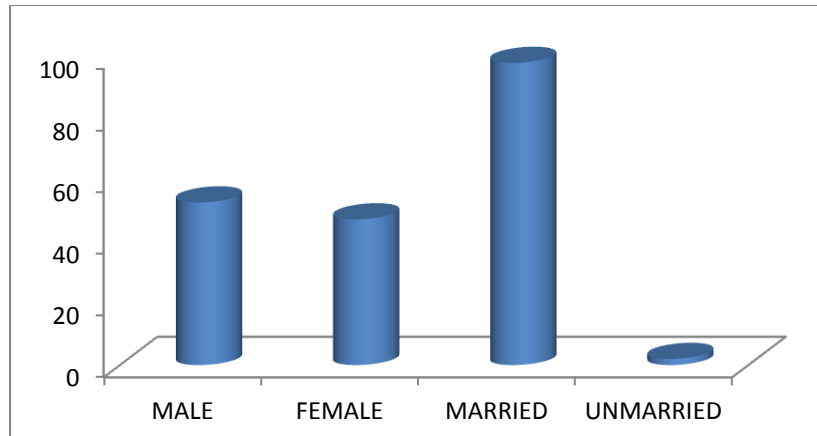
**Fig.44: Geological map of Mirzapur District.**

### Socio- Economic Profile of Mirzapur District and Impacts of Mining:

#### Socio-demographic characteristics of the respondents.

##### Gender & marital Status of the Respondents:

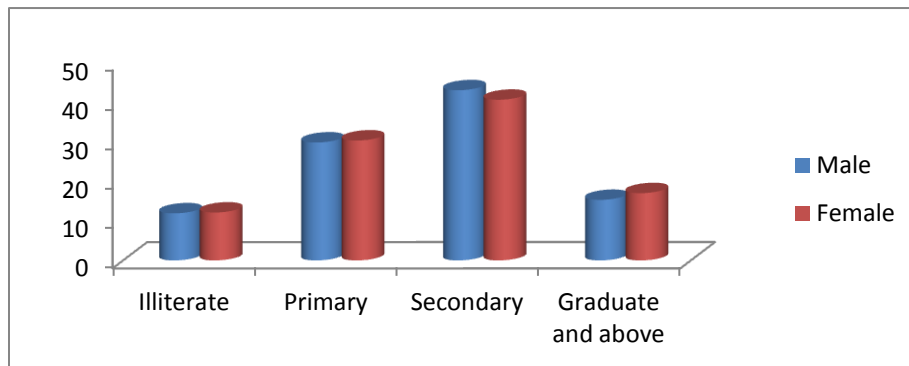
Figure 45 shows the Gender and marital Status of the Respondents for the mining area in Allahabad. Out of the total respondents 53% were male and 47% were female. 98 % respondents were married and 2% were unmarried.



**Figure 45:** The Gender and marital Status of the Respondents

### Education Status of the Respondents:

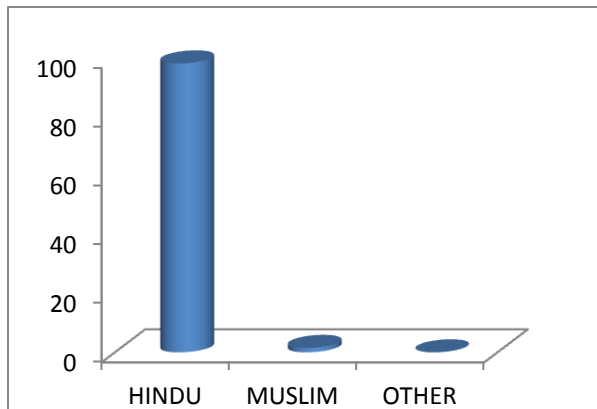
Education Status in Allahabad mining sites is depicted in fig 46. Total 12 % of men and 12 % of women respondents were illiterate and literacy level is very poor. 30 %, 43% and 15 % men are educated primary, secondary and graduate and level respectively. While 30%, 41% and 17 % women are educated primary, secondary and graduate and level respectively.



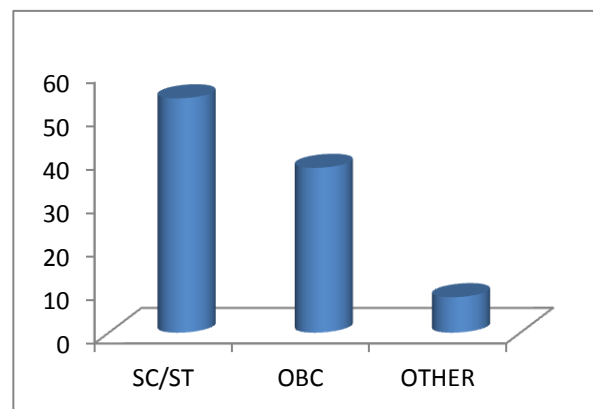
**Figure 46:** Education Status of the Respondents

**Religious Status and Caste, Family Structure of the Respondents:** Religion of respondents in Mirzapur district depicted in Fig 47. 98 % of respondents were Hindu and 2 % were Muslims. Other religious community is absent. Caste status of Mirzapur mining site depicted in fig 48. About 38% of respondents belong to other backward community, 54% belong to Schedule caste/ Schedule tribe community and rest comprised other community, Brahmin, chhatriya etc. Family structure is mainly nuclear type and among 80 % belongs to the

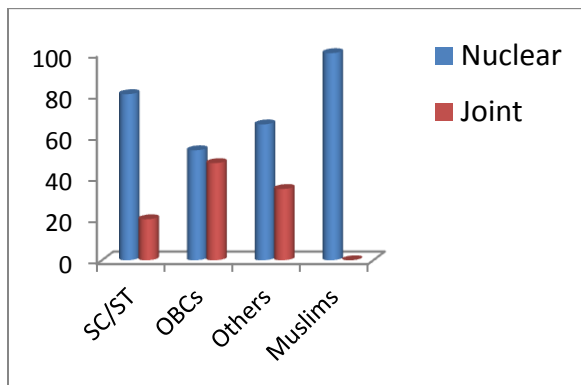
nuclear family type and 20 % were having joint family. Similar family structure was also observed in other cast also and 53 % of OBC and 100 % of Muslims and 66 % belonging to other caste's family. Rest of the respondents were nuclear type are joint type (Fig.49). Caste wise income is depicted in figure 50. In Mirzapur district SC/ST and OBC belongs to all income group, while other caste belong mainly to income lies in 50,000 to 100000/-group.



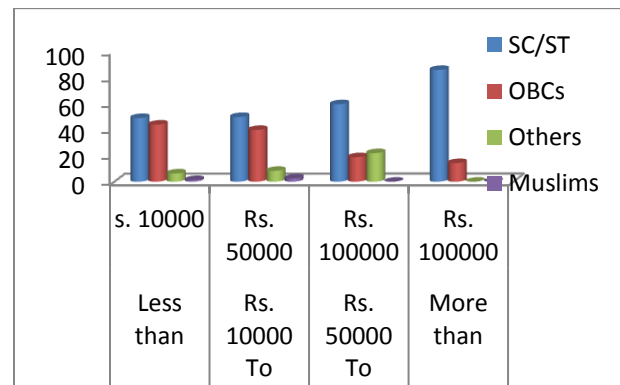
**Figure 47: Religion of Respondents**



**Figure 48: Caste Structure of Respondents**



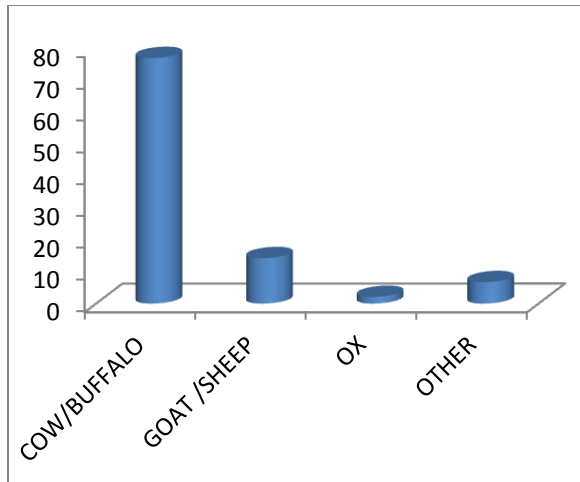
**Figure 49: Caste-wise types of family**



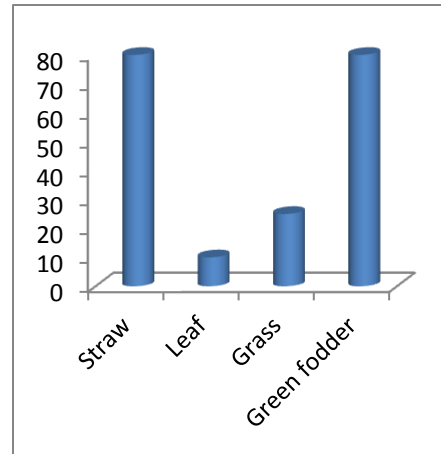
**Figure 50 Caste-wise annual Income**

**Dependency on Forest:**

Local people depends on forest for their fodder supply for their livestock population and fuel wood etc. Livestock population are basically milk producers cow and buffalos (77 %), sheep and Goats (14%), Oxen (2%) and other (7%) (Fig 51). However, a major portion (80%) of fodder requirement is fulfilled by wheat straw. Green fodder is also fulfill the requirement of fodder. Livestock belonging to lower community depends on grazing in forest area and leaves of forest trees (Fig 52).

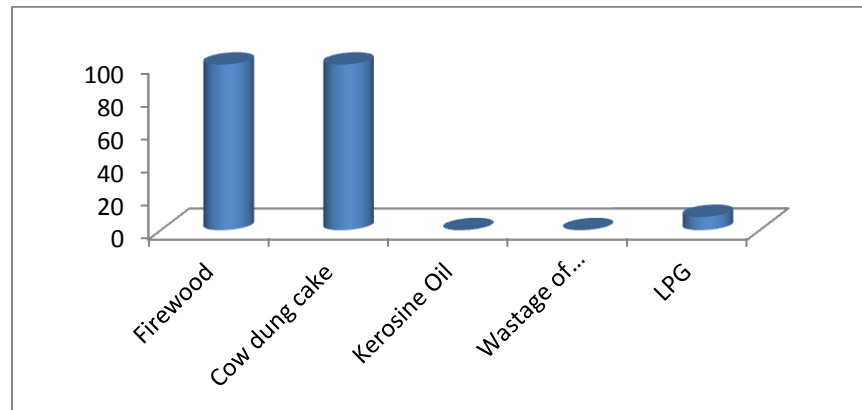


**Figure 51: Livestock population**



**Figure 52: Type of fodder used for livestock**

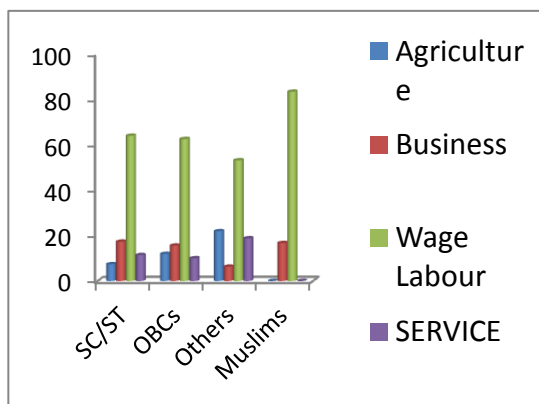
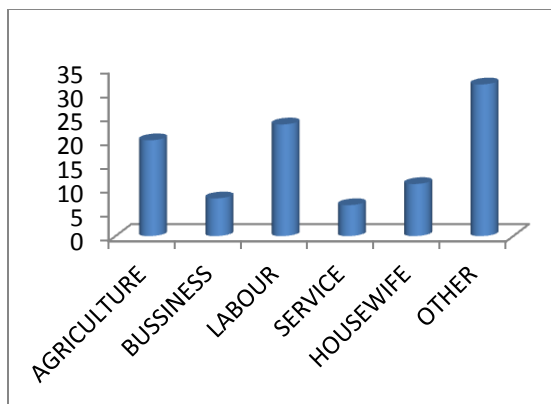
For fuel, mainly depends on firewood and cow dung cake. Only few are using LPG for their fuel demand (fig 53)



**Figure 53: Type of fuel used**

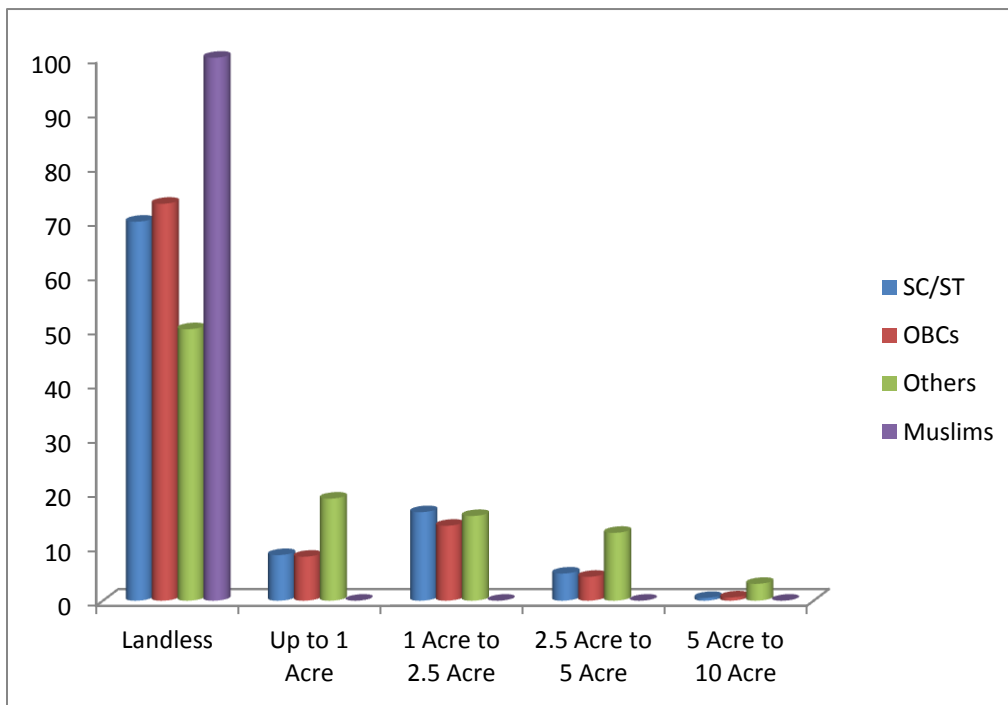
**Occupation of respondents:**

As shown in Figure 54, 20 % of the respondents were engaged in farming as their main occupation and 32 % of respondents involved in other occupation. 23 % of the respondents were engaged as laborer in mining. Only 6 % of the respondents were engaged in service and about 3.375 were engaged in business and trading and the remaining were engaged in other occupations.



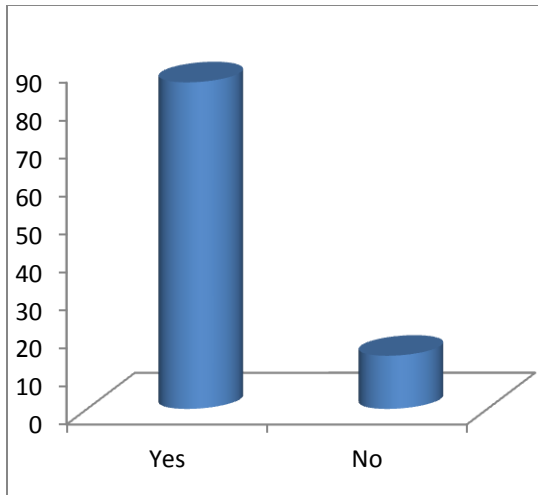
**Figure 54: Occupation of the Respondents** **Figure 55: Caste-wise Occupation of respondents**  
 Caste wise occupation is depicted in fig. 55. Among SC/ ST and OBC, main occupation is as wage labour in mining, in construction and farming, whereas agriculture is main occupation for other case.

**Caste-wise Land holding Pattern:** Caste-wise Land holding is depicted in figure Fig 56. Major population belong to landless category ( SC/ST 70%, OBC 73%, others 50% and Muslims 100%). whereas only 3% others have land holding pattern ranging from 1 Acre to above 10 Acre (Fig 56).

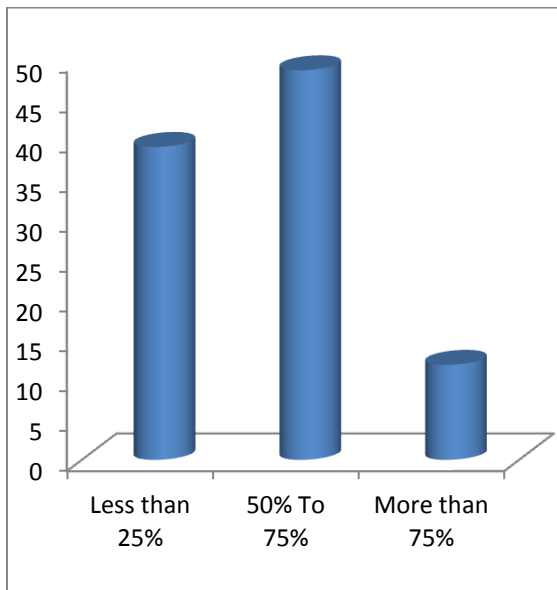


**Figure 56: Caste-wise Land holding Pattern**



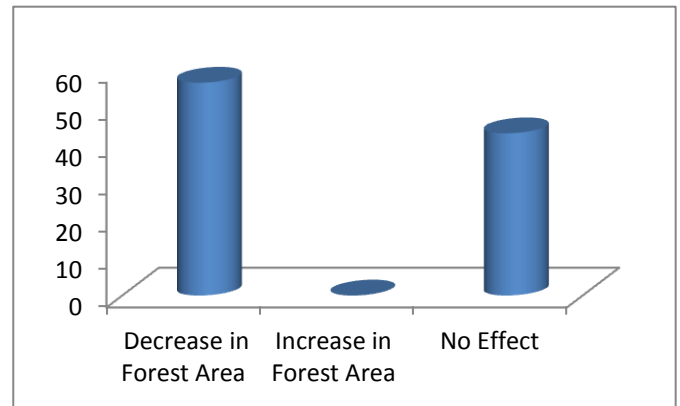


**Figure 57: Decrease in Forest in Area ?**



**Figure 58: Extent of Forest in Vicinity Area**

In vicinity of the area , the decrease in forest area is reported by major of respondents (86%) Fig. 57. Extent of forest in vicinity is about 50 to 75 % as reported by 49% of respondents (Fig 58). About 83 % respondents accepted about adverse impact of mining on forest and according to them the forest area is decreased after mining. One of the most severe impacts of mining has been the changes it has brought to local land use patterns and concurrently its land scape. It has been found out that maximum land diverted for mining activity is either forest land, agriculture fields or common grazing land. According to about 6 % respondents, the forest area increased after the planting activities done by forest department (Fig 59).



**Figure 59: Impact of Mining in Area on Forest**

### Type of Mining in Mirzapur:

Type of Mining in Mirzapur is developed during long course of time as small-scale cluster. In almost all cases, mining is open cast which involves digging of pits and hillside excavation and is responsible for developing an undulating dangerous landscape. It also leads to large-scale devastation of soils. With such mines, the land surface over a considerable area is destroyed, and what is left behind may be unstable land, causing landslides, erosion, siltation, and polluted water. It disrupts ecosystems, scars the landscape, and destroys microbial communities resulting in degradation of forests. Quarries/pit created and artificial hills formed during mining operation such as deposition of overburden are a major problem in the area. Such land is generally useless after the mining ends and may continue to cause environmental problems stretched beyond after the mine has been closed. About 92 % mining is open cast, only small portion (8%) is contributed by sand mining from river (Fig 60). Stone, gitti, boulder mining is 67%, sand and morum contribute 33% and rest is sand mining from river (Fig 61).

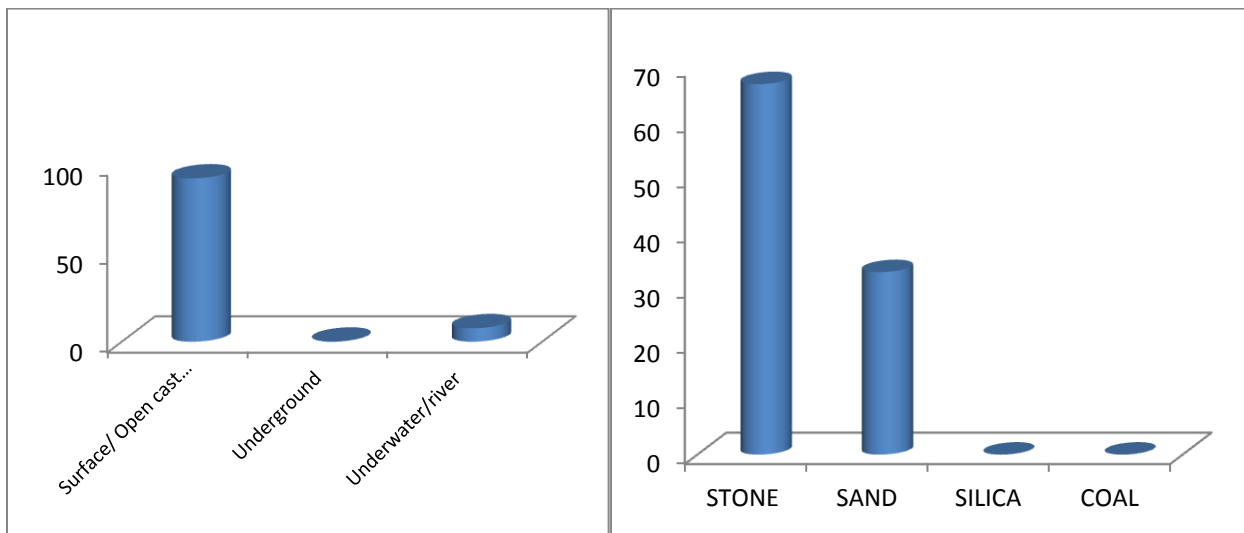
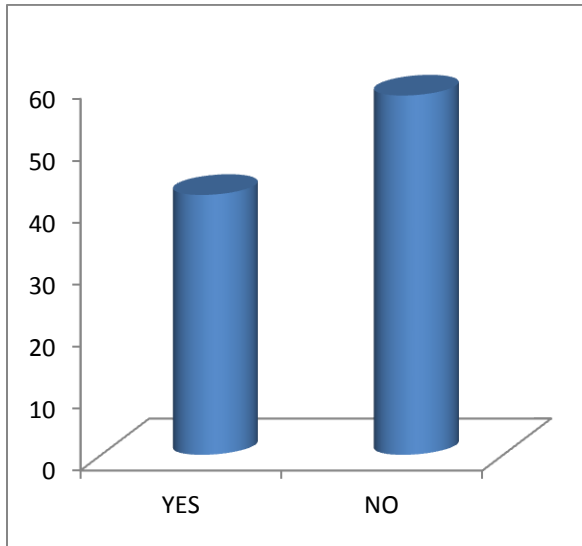


Figure 60: Type of Mining in Allahabad

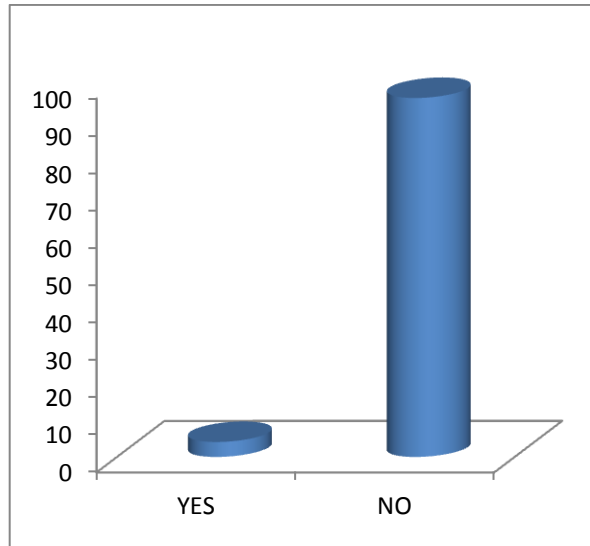
Figure 61: Type of Mining product

### Awareness about Forestry Programmes and Mining Policies:

Regarding the awareness about Forestry Programmes, most of the respondents (42%) were aware about the programmes run by Forest Department and 58 % were unaware about the forestry programmes (Fig 62). About mining policies and rules regulation on 4%, a very little number, were aware and large populations were unaware (96%) (Fig 63).



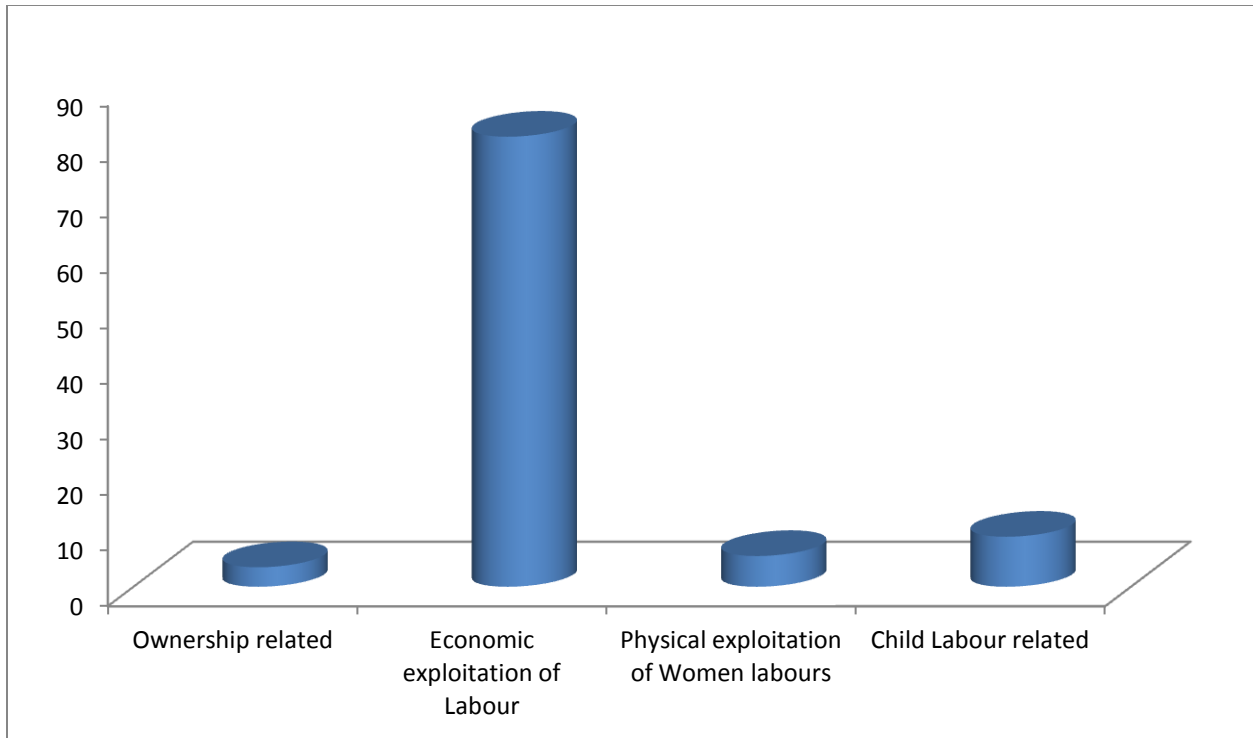
**Figure 62: Awareness about Forestry Programmes**



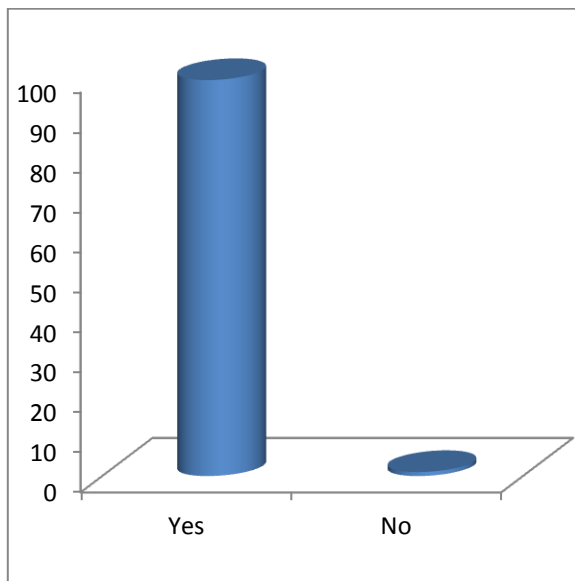
**Figure 63: Awareness regarding mining rules & policies**

### **Dispute in Mining:**

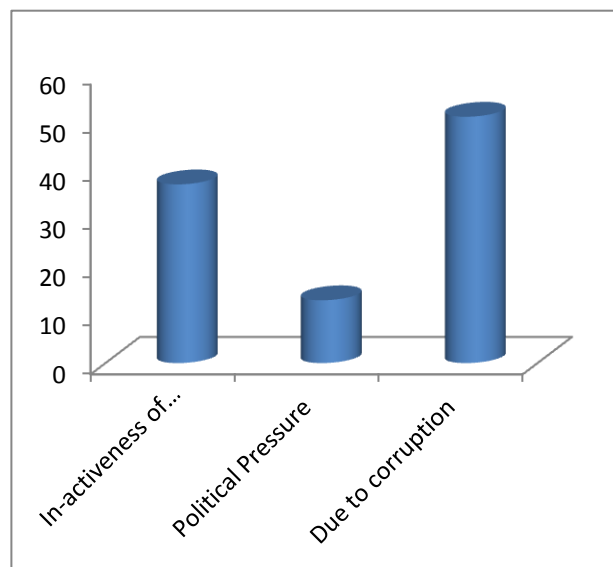
Mining is responsible for the generation of several disputes. Disputes related with exploitation of labour involved in mining was found about 61 %, ownership of mining area related disputes were about 4 %, problems related with physical exploitation of women labour also found a valid reason of dispute (6%). Child labour related problems accounts for 9% (Fig. 64). Regarding illegal mining, about 99% respondents responded in 'yes' and 1% answered 'No'(Fig 65). For illegal mining area, 37% respondents accused to in-effectiveness of administration, 13 % to corruption and 51% to political pressure for illegal mining (Fig 66).



**Figure 64: Type of Major Dispute in Mining**



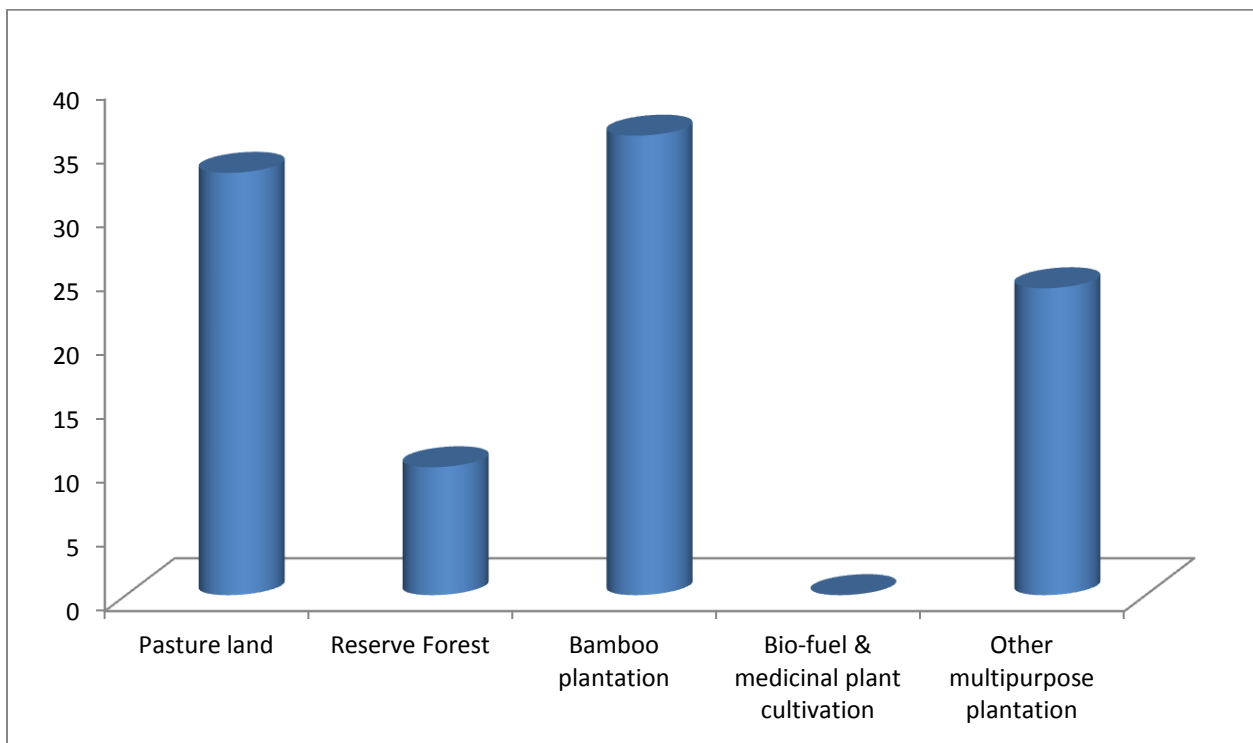
**Figure 65: Is there any illegal mining?**



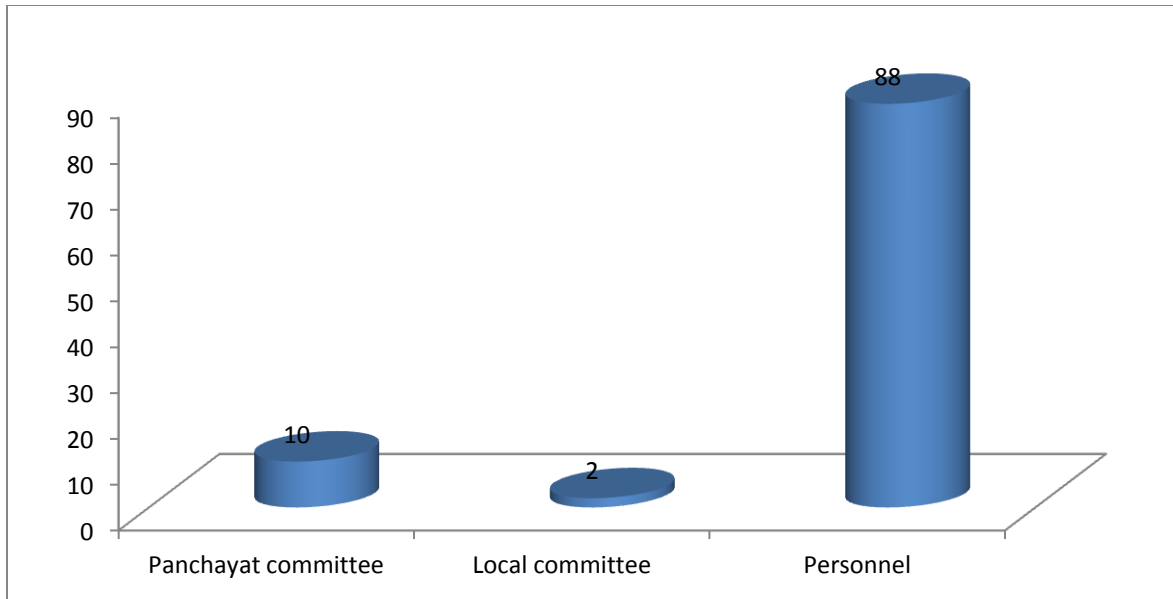
**Figure 66: Reason of illegal Mining**

### Land Use Preference after Closure of Mining:

Preference of post mining land use were questioned. In Mirzapur district most of the respondents (33%) were preferred the development of a pasture land one mined land available for grazing to their livestock, whereas 20% and 36% of respondents were preferred to develop reserve forest and Bamboo plantations, respectively. About 24 % respondents preferred multipurpose plantation (Figure 67). According to 10% of respondents recommended to management of post mining land restoration by Village Panchayat Committee, while 88% recommended the management by personal management or by the land owner (Figure 68).

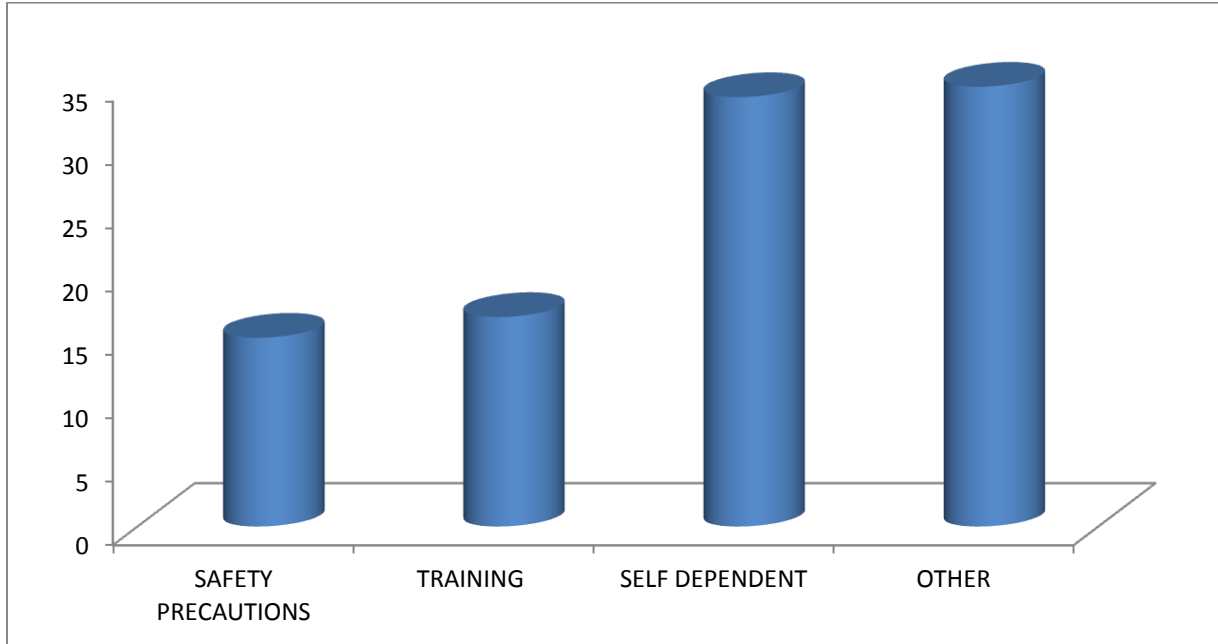


**Figure 67: Preferred Post mining Land use**



**Figure 68: Management of Post- Mining Land Restoration**

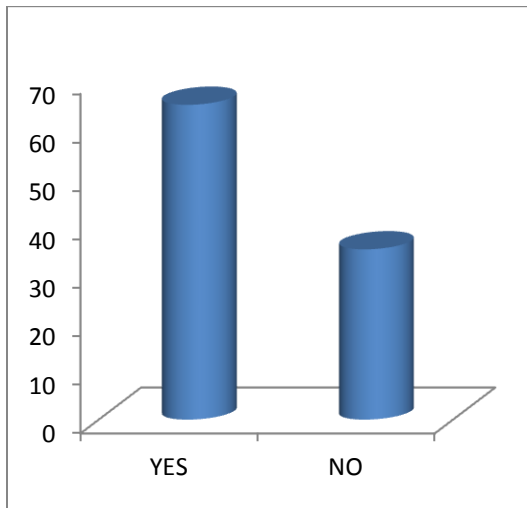
On issue of women safety, most of the respondents (35%) had different ideas, while about 17% recommended the requirement of training to the women for their safety. According to the 34 %, women should be self dependent for their safety (Fig. 69).



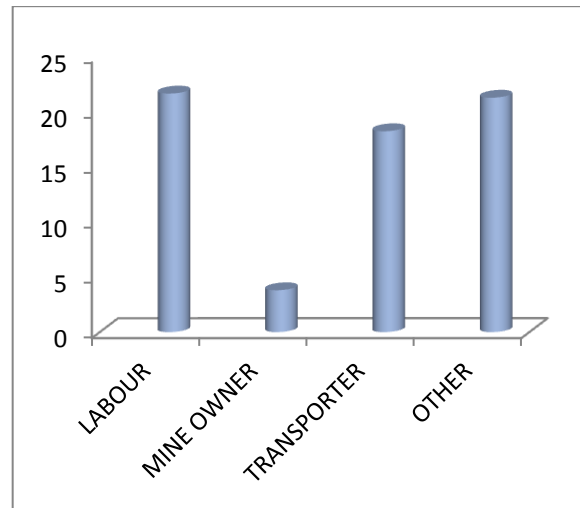
**Figure 69: Issues on women safety in mining**

## Dependency of Local Populace on Mining:

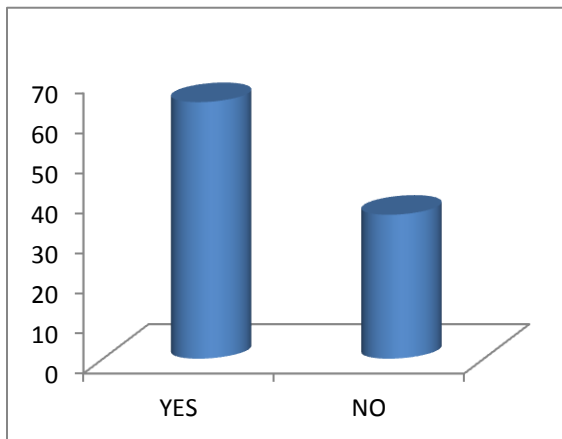
About 65% people were dependent on mining for their livelihood and 35% depends on other sources for their livelihood (fig 70). As far as type of dependency on mining was concerned, out of this 65%, about 22 % were involved as labourer, 18% as transporter, 4 % as mine owner and 21% were dependent on mining in various ways, either involved as middle man or selling etc. (Fig 71). As far as effect of closure of mining on livelihood was concerned on the livelihood, about 64% respondents were getting affected (Fig 72), out of which, livelihood of 33 % of respondents were getting affected 100%, whereas 17% were affected 50 to 100% and 18% were getting affected by 50% (Fig 73).



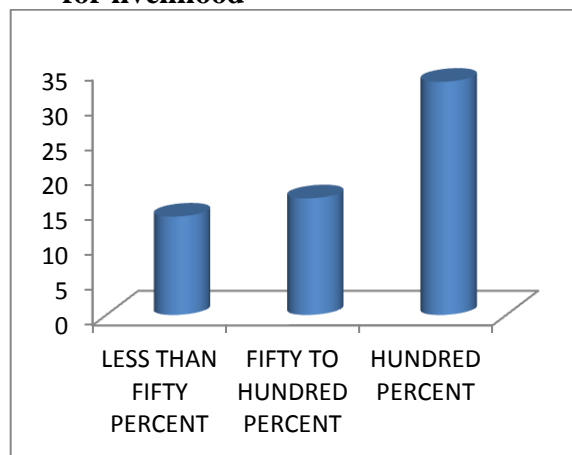
**Figure 70: Dependency on mining for livelihood**



**Figure 71: Type of dependency on mining for livelihood**

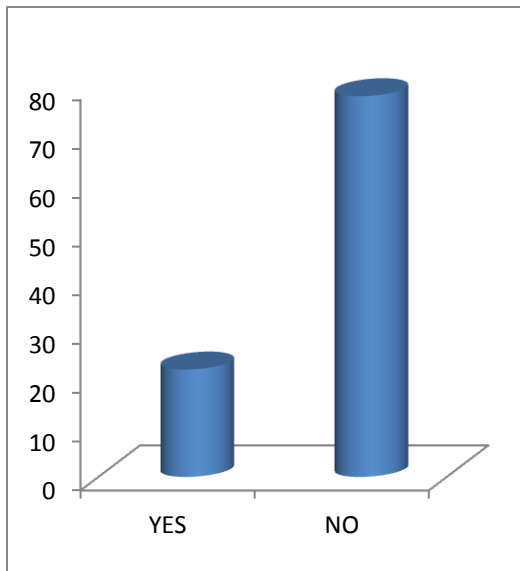


**Figure 72: Effect of closure mining activity on livelihood**

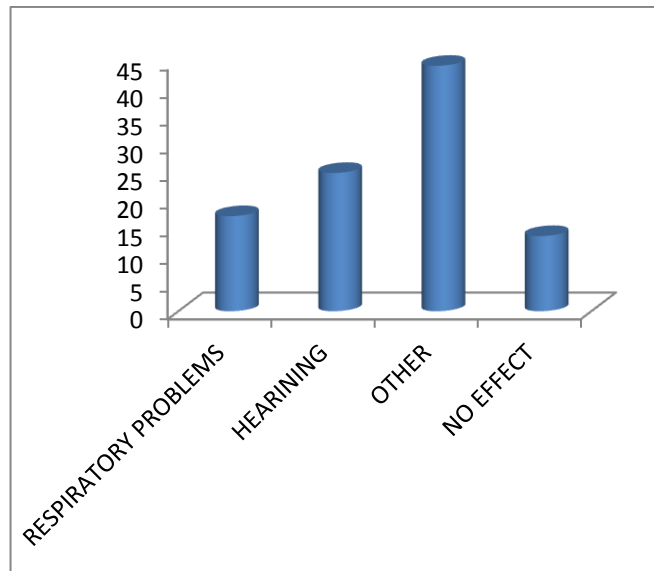


**Figure 73: Extent of effect on Livelihood**

**Health Hazards and Safety Adopted:** Majority of the health problems in mining regions are caused due to unchecked pollution and high levels of toxicity, mine tailings and mine disasters. The health and safety problems vary from one mineral to the other, from the technology used, type of mining- open cast to underground - and the size of operations. The lands, water bodies, air and environment are polluted due to constant release of chemical wastes, dust generated by blasting and excavation, and the dumping of mine wastes and over-burden in the surrounding lands and rivers. About 22 % respondents responded that safety precautions were being adopted during mining, while 78% respondents denied about the safety precautions (Fig 74). In response to the health problems, about 17% mentioned that respiratory diseases were common in mine workers, while 25% and 44% mentioned hearing and water related problems, respectively (Fig 75).



**Figure 74: Safety Precautions adopted in Mining**



**Figure 75: Health related problems due to mining**

**Effect of Mining on Agriculture:**

Effect of mining on agriculture is mainly due to dust generated from crushers which deposited on nearby agriculture land and reduce its productivity. Movement of vehicle for transporting the mining products also leads to generate more dust including which were getting deposited in the nearby field thus affecting the fertility of soil. It can be mentioned that mining



activity has definitely affected the quality of soil (both physical as well as chemical) thus affecting the productivity & livelihood of people. About 81% respondents accepted the adverse effect of mining on the agriculture and 19 % mentioned 'not' (Fig 76). About 50% respondents accepted the decrease in agriculture production, while 19 respondents mentioned increase in crop production which was totally un-justified, but according to the, due to mining the rocks were removed from their land which increase the production and increase in input cost. 31% respondents has no idea regarding the effect (Fig 77).

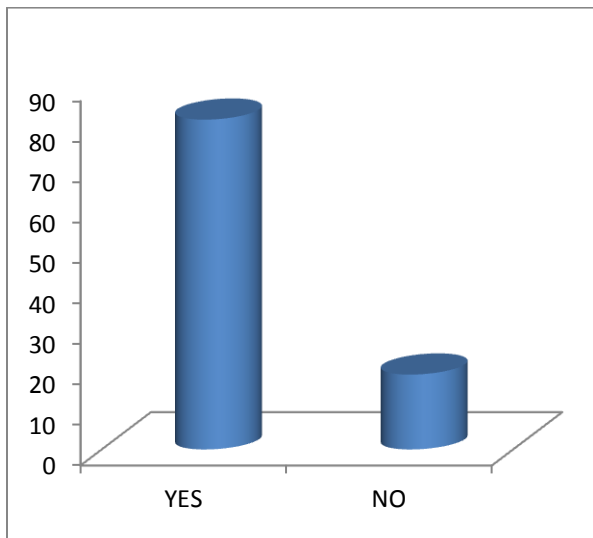


Figure 76: Effect of Mining on Agriculture

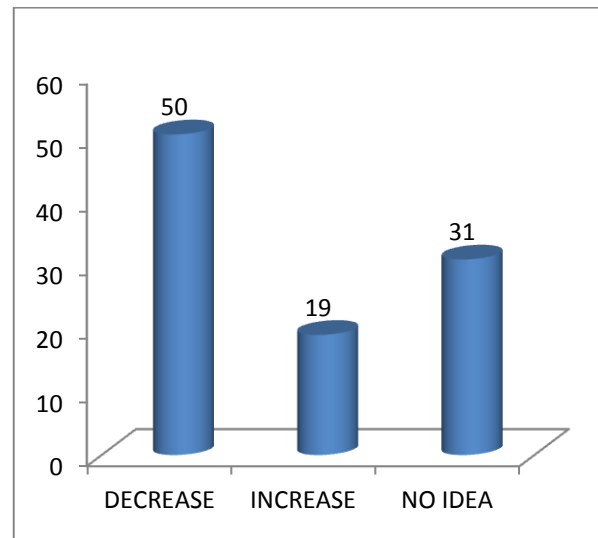
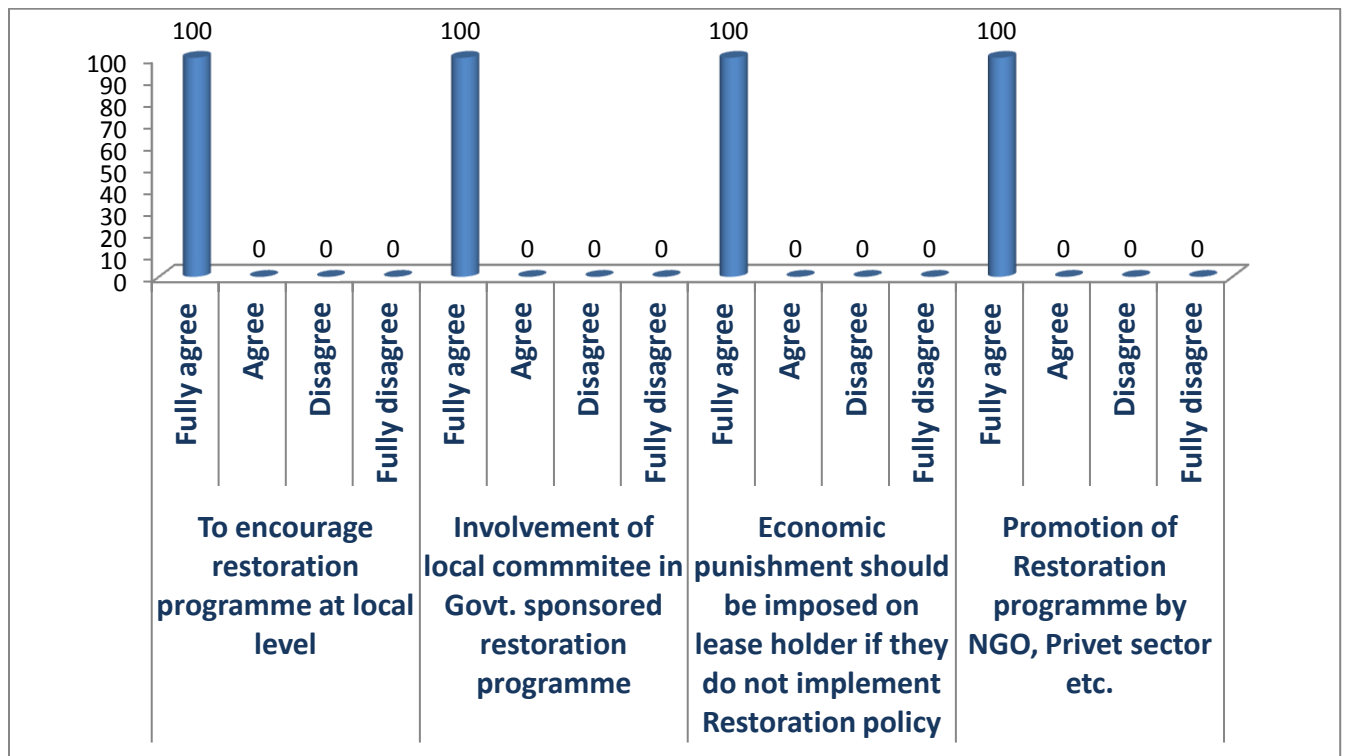


Figure 77: Effect of Mining on Agriculture production

### Perceptions of Respondents about Restoration related statements:

Opinion of respondents about the restoration of the abandoned mined land were asked, they were fully agreed to the restoration programme at local level (100%), the involvement of local committee in Government sponsored restoration programme (100%), and the implication of lease holder in case of violation of rules (100%). However respondents (100%) were fully agreed with the promotion of restoration programme by NGO, Private sector level, but they suggested the proper and regular monitoring of non government body by Government Authority (Fig 78).



**Figure 78: Perceptions of respondents regarding the restoration programme**

**Participatory Rural Appraisal Study of Mirzapur Mining Area:**

Major mining areas of Mirzapur District (Lalganj, Chunar, Madihan & Sadar Tahasil of Mirzapur) are backward area despite the rich mineral resources it has and despite the revenues the state receives from mining of these rich mineral resources. Mining is a capital intensive activity of the area having rather low level of other economic activities, e.g., agriculture, horticulture and forestry etc. The socio-economic profile of the local people was obtained from Participatory Rural Appraisal (PRA) tool which is depicted in Table 4. PRA was conducted through meetings in nearby villages of mining area. The majority of the people are Schedule Tribes involved in mining. Most of them are landless labourers and therefore, they are placed at the bottom of the social heap. This area is characterized by rigid caste and class hierarchies that are expressed in terms of hostility towards the lower castes, frequent violence, threats, robberies and assaults on women. Literacy level was very poor and most of the females were illiterate. Literacy level of males is only about 50%, that to only up to the school level. Government

primary schools are functioning in the villages. Intermediate colleges are available only at Tahsil level. Most of the children (aged 5-12years) were school going. Since three-fourths of the mining area is rocky and therefore, is unfit for cultivation. So there is no possibility of viable agriculture or any existing agro-forestry system. The local people rely mainly on the mining and exploitation of natural resources to develop their household economy. Mining in the area is providing employment directly or indirectly to people of the surrounding villages and their main occupation was mine labour in silica mines and in silica washing plants. Findings are briefed in table 8.

**Table 8:** Socio-Economic Study of Stone Mining Area in Mirzapur through Participatory Rural Appraisal Tool

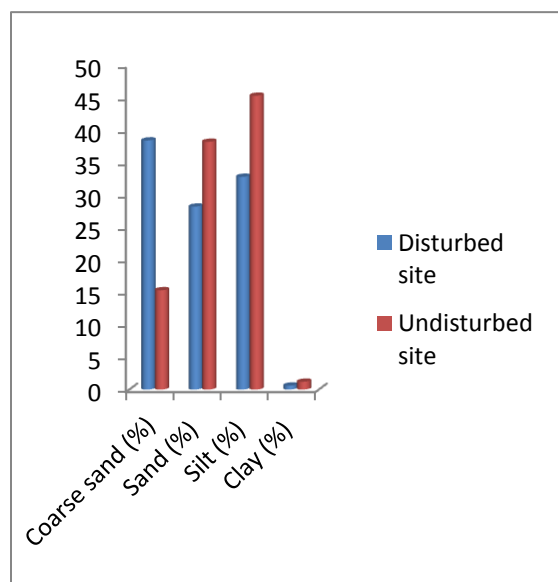
<u>Sl. No</u>	<u>Parameters</u>	<u>Local villages of Padari Mirzapur area</u>
1	<u>Site specification</u>	<u>Stony/Plateau/Hilly</u>
2	<u>Location</u>	<u>25 Kms from Mirzapur</u>
3	<u>Community Composition</u>	<u>Mixed</u>
4	<u>Literacy</u>	<u>50% Male have Primary Education &amp; Most of the Female are Illiterate</u>
5	<u>Occupation</u>	<u>Marginal Farmers, Mine related Activities, Service &amp; Business etc.</u>
6	<u>Monthly income (Approx.)</u>	<u>Rs.8500-12000/family</u>
7	<u>Agriculture crop</u>	<u>Wheat, Paddy, Pulses, Vegetables &amp; Mustard etc.</u>
8	<u>Fuel wood:</u>	<u>a) Dry branches of trees from local forest, Cow-dung Cake &amp; LPG/Stove in few cases</u>
	<u>a) Source:</u>	<u>b) 1.5 to 2 Quintals/month/family</u>
	<u>b)Need:</u>	
9	<u>Livestock</u>	<u>Cows ,Oxen, Buffaloes &amp; Goats etc.</u>
10	<u>Fodder source:</u>	<u>Agricultural Products, Wild Fodder Grasses, Leaves of Zizyphus sps., Acacia sps, Neem &amp; Carrisa carandus etc.</u>
11	<u>Timber species required for local use</u>	<u>Mango, Bamboo, Babul &amp; Shisham etc.</u>
12	<u>NTFPs used</u>	<u>Articles from Bamboo &amp; Agarbatti Making etc.</u>
13	<u>Marketing of NTFPs</u>	<u>=</u>
14	<u>Mining in Area</u>	<u>Stone Mining by local Lease Owners/holders &amp; Sand Mining from rivers. Whole area prone to illegal &amp; irregular Mining.</u>

- |    |  |  |
|----|--|--|
| 15 | <u>Management of Mining Area &amp; Restoration</u> | <u>Mining not properly managed. Forest Department has been undertaking Plantations only in Forest Areas, mainly of Tree species. No Systematic Eco-restoration Efforts/Works in Mining Areas have been reported.</u> |
| 16 | <u>Choice of species preferred by Villagers</u>    | <u>Shisham, Bamboo, Aonla, Mango, Karaunda, Mahua, Guava (As Fruit Crop), Fodder &amp; Grasses.</u>  |

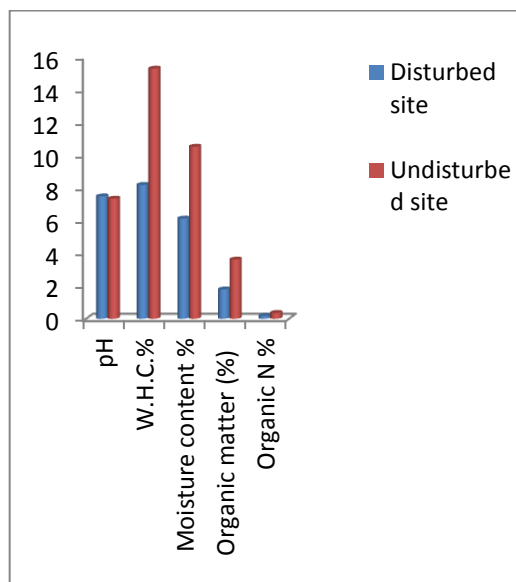
**Impact of Mining on Flora and Soil Characteristics:**

**Soil parameters of Stone Mining-Mirzapur:**

It is essential to determine the soil status in the area to identify the impacts of mining on soil quality. Accordingly, a study of assessment of the soil quality has been carried out. It has been found out that organic matter and Nitrogen content in all the soil samples collected from mining site are found to be less with comparison to the undisturbed which is mainly due to removal of soil layer and deposition of dust from mining In all the samples it has been found out that increased solution of stable lechates of iron has affected the fertility of soil. Similarly the PH of the soil is slightly acidic. The moisture content in mining area soil is not found to conducive for agricultural activity. Water Holding Capacity and Moisture content of soil of mining area is less in comparison to undisturbed area (Fig 80) which is mainly due to the coarse sand and sandy part in mining area sample which contributes 56% (Fig. 79).



**Figure 79: Soil Texture Analysis**



**Figure 80: Soil physico-chemical Parameters**

Texture analysis and physic-chemical parameters of Soil sample of Padari stone mining area are depicted in Fig 79 and Fig 80 respectively. Observations, similar to stone mining area in Meja, were observed in this case also. Samples from mining site was low in moisture retention capacity, organic carbon and nitrogen (Fig 80). Coarse sand and sand parts contributed 66% of mining area sample, silt 32% (Fig 79).

### Impact of Stone Mining area on Flora :

Flora study was conducted for stonetype of mining being conducted in Mirzapur. In 100 meter range mostly herbs were found, trees and shrubs were absent due to their felling for the mining process. In case of stone mining, total 13 species were reported in undisturbed site (100 m from mining site). Being stony area less vegetation was found. Whereas in mining site only nine species were reported (Table 9 and 10). Jaccard's Index of similarity was 0.533; it means biodiversity was affected by 0.277. All species present at mining site were also reported at undisturbed site.

**Table 9: Impact of Stone Mining on Vegetation at Mirzapur:Undisturbed Site (100m away from mining Site)**

S.No.	Species	Comman name	Family	Frequency	Density	RF	RD	IVI
1	<i>Xanthium indicum</i>	Chhota Dhatura	Asteraceae	100	33.33	7.69	1.7	9.4
2	<i>Tridax procumbens</i>	Musbhari	Asteraceae	100	120	7.69	6.13	13.83
3	<i>Semecarpus anacardium</i>	Bhilwa	Anacardiaceae	100	146.67	7.69	7.5	15.19
4	<i>Phyllanthus niruri</i>	Jaramla	Phyllanthaceae	100	206.67	7.69	10.56	18.25
5	<i>Oxalis corniculata</i>	Khati Buti	Oxalidaceae	100	256.67	7.69	13.12	20.81
6	<i>Evolvulus alsinoides</i>	Neeli Shankhpusphi	Convolvulaceae	100	120	7.69	6.13	13.83
7	<i>Eclipta prostrata</i>	Bhingraj	Asteraceae	100	170	7.69	8.69	16.38
8	<i>Cannabis sativa</i>	Bhang	Cannabaceae	100	110	7.69	5.62	13.31
9	<i>Boerhavia diffusa</i>	Punarnawa	Nyctaginaceae	100	260	7.69	13.29	20.98

10	<i>Cynodon dactylon</i>	Dub	Poaceae	100	293.33	7.69	14.99	22.68
11	<i>Digitaria adsedense</i>	Kreb grass	Poaceae	100	103.33	7.69	5.28	12.97
12	<i>Solanum xanthocarpum</i>	Katai	Solanaceae	100	56.67	7.69	2.9	10.59
13	<i>Tribulus terrestris</i>	Gokhuru	Zygophyllaceae	100	80	7.69	4.09	11.78

**Table 10: Impact of Stone Mining on Vegetation at Mirzapur:At Disturbed Site**

S. No.	Species	Comman name	Family	Frequency	Density	RF	RD	IVI
1	<i>Semecarpus anacardium</i>	Bhilwa	Anacardiaceae	100	56.67	11.11	8.59	19.7
2	<i>Phyllanthus niruri</i>	Jaramla	Phyllanthaceae	100	50	11.11	7.58	18.69
3	<i>Oxalis corniculata</i>	Khati buti	Oxalidaceae	100	50	11.11	7.58	18.69
4	<i>Evolvulus alsinoides</i>	Neeli Shankhpusphi	Convolvulaceae	100	60	11.11	9.09	20.2
5	<i>Eclipta prostrata</i>	Bhingraj	Asteraceae	100	100	11.11	15.15	26.26
6	<i>Cannabis sativa</i>	Bhang	Cannabaceae	100	76.67	11.11	11.62	22.73
7	<i>Boerhavia diffusa</i>	Punarnawa	Nyctaginaceae	100	103.33	11.11	15.66	26.77
8	<i>Cynodon dactylon</i>	Dub	Poaceae	100	106.67	11.11	16.16	27.27
9	<i>Solanum xanthocarpum</i>	Katai	Solanaceae	100	56.67	11.11	8.59	19.7

## **Suggestions/Recommendations of Brainstorming Session with Stakeholders held at Mirzapur**

A stakeholder meeting was conducted in Mirzapur covering all important issues related to Sanction of Mining Lease, Disputes related to Land, Mine Workers & Wages etc, Mining Policy, Rules & Regulation related issues, Social & Ecological Issues and other miscellaneous issues specified by stake holders. Issue were discussed in detail and following suggestion and Recommendations are come out of the session:

- Felling permit for trees in sanctioned lease area should be provided to Lease Owners/holders & they should be allowed to fell & cut the tree.
- Land Demarcation of Forest & State Land should be defined and properly demarcated on ground so that problems arising out of Land Ownership Disputes may be minimized. Lease Boundary should be properly demarcated on ground with Lease specific Flag bearing Poles/Posts.
- Specific Mining Area should be clearly marked by a Signboard carrying all details of sanctioned Mining Lease.
- Labour Wages should be paid as per the norms of the Labour Commissioner.
- Sanction of Mining Lease should be permitted at the District level.
- Safety & Security Provisions, especially for female mine Workers & Mine Labourers should be made mandatory to avoid untoward social issues.
- Hardy species like *Haplophragma adenophyllum* (Kathsagaun) should be planted in mining area for Eco-restoration purposes.
- Rs. 32000/annum/acre revenue collected by Revenue Department. It was suggested by Mine Owners to fix Royalty as Progressive Percentage of Mine Area actually mined.
- Land Owner is given priority to sanction the Mining Lease for mining operations.
- Minimum distance from Forest for establishing the Crushers to be fixed as 1 Km from the periphery of Forest areas.
- Dust from Crushers may go up to a distance of 100 m. Therefore, the minimum distance from Habitation areas should be fixed at 500 m.
- Forest Department should permit the mining in barren Forest Areas on lease basis.

- Mining Area should be jointly inspected by a Team of Mining Surveyor, Environmental Auditor & Forest Range Officer for finding the suitability of the Mining Area for sanctioning the Mining Lease.
- For establishment of Crushers, NOC from the Forest Department should be made mandatory. Presently, it is not required, as suggested by forest department people.

## **Sonbhadra District**

### **Socio-Economic Profile**

### **&**

### **Impacts of Mining on Vegetation & Soil Parameters**

#### **DISTRICT –SONBHADRA**

**Location-** District Sonbhadra lies in the southeast of Uttar Pradesh, bounded by Mirzapur & Chandauli in the north, Jharkhand in the east, Madhya Pradesh in the west & Chhattishgarh in the south

**Topo sheet No.-**63L, 63P, 64I, 64M

**Latitude-** 23<sup>0</sup> 51'54" N - 24<sup>0</sup>46'18" N

**Longitude-**82<sup>0</sup>40'24" E - 83<sup>0</sup>33'15" E

**Area-**6788 sq. Km

**Geological Setup** -Sonbhadra lies between Vindhya & Kaimur hills

**Major Rivers** - Son, Belan, Rih& & Kanhar

**Minerals:** Sonbhadra district has rich mineral resources. Government organisations as well as private lease holders are doing mining in these areas. Mining is a major activity of the region with open cast coal mining at border area of Singrauli. Many small scale rock quarries (i.e., stone crusher units) are also found around Churk, Dala & Obra region. Geological map of the district is depicted in fig. 4. District Sonbhadra enriched with following minerals:

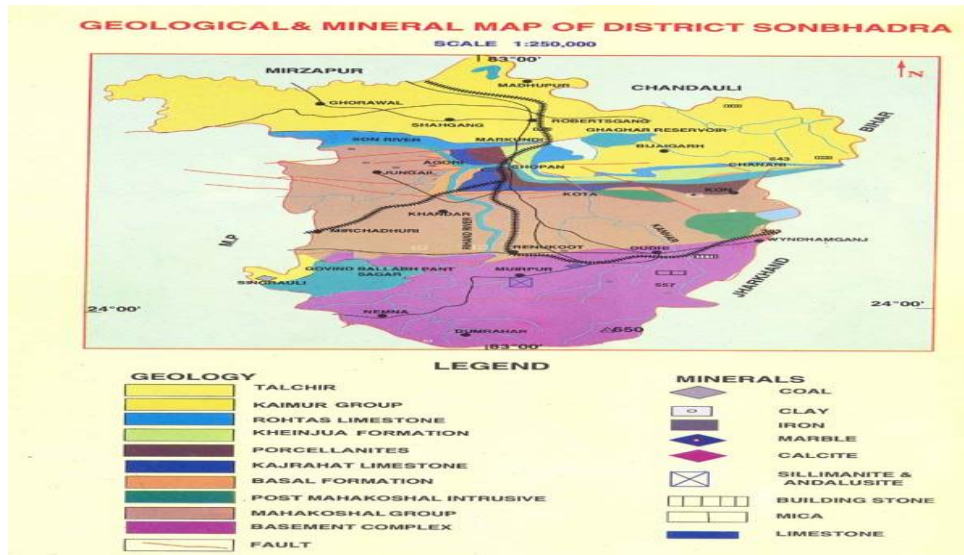
- **Major minerals-** Coal, Limestone & Dolomite
- **Minor minerals-** Granite, Sandstone, Morrum & Sand

**Revenue from major & minor minerals (2013-2014)-**Rs.7701.79 Lakhs

#### **Mining Area in Sonbhadra:**

- Sand /Morum Mining site: Son & Kanahar River Zone
- Stone Mining site : Billimarkundi, Dala, Julgul, Kalkhan Chopan
- Coal Mining site :Bina, Kakari, Khadia, Dudhichua





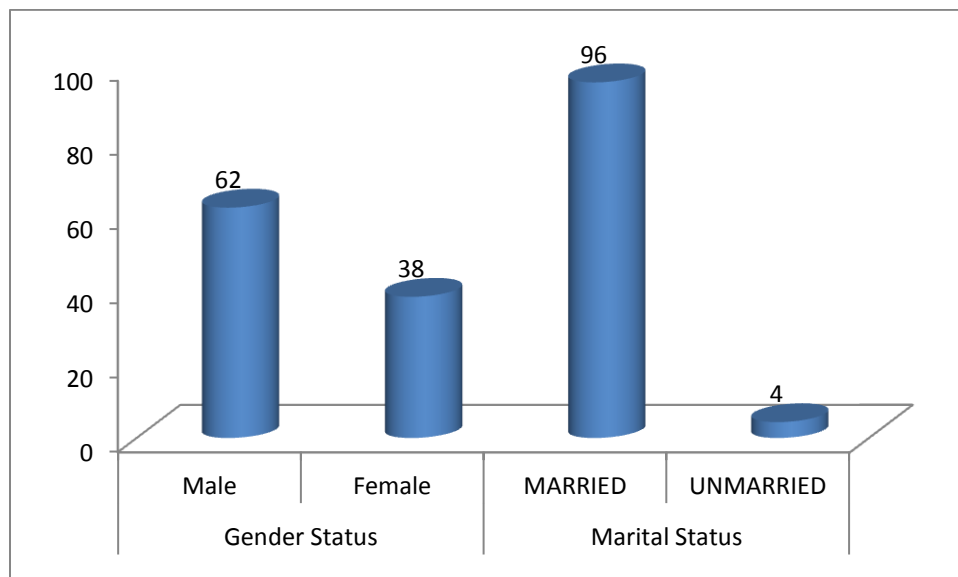
**Fig. 81: Geological map of Sonbhadra District.**

**Socio- Economic Profile of Sonbhadra District and Impacts of Mining:**

**Socio-demographic characteristics of the respondents.**

**Gender & marital Status of the Respondents:**

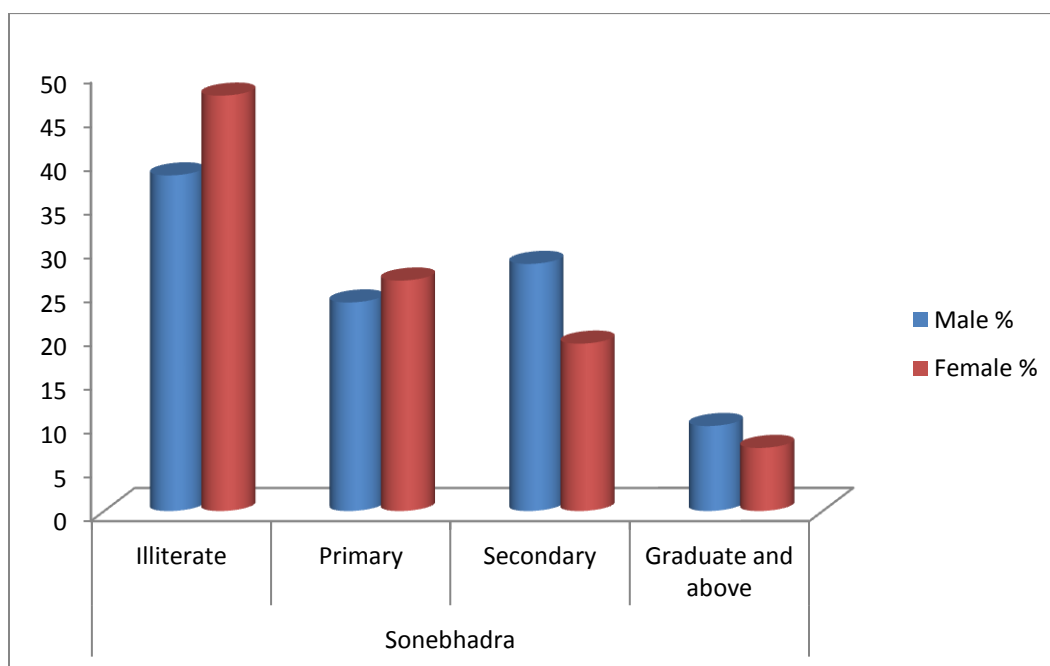
Figure 82 shows the Gender and marital Status of the Respondents for the mining area in Sonbhadra. Out of the total respondents 62% were male and 38% were female. 96 % respondents were married and 4% were unmarried.



**Figure 82: The Gender and marital Status of the Respondents**

### Education Status of the Respondents:

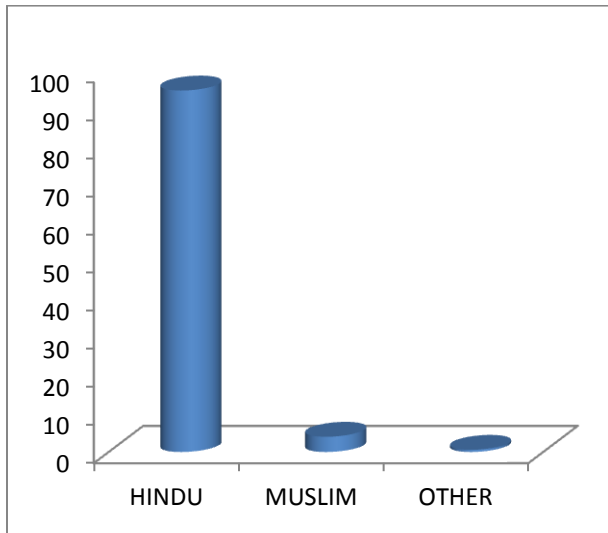
Education Status in Sonbhadra mining sites is depicted in fig 83. Total 38 % of male and 47 % of female respondents were illiterate and literacy level was very poor. Total 24 % of male and 26 % of female respondents were having primary education. Total 28 % of male and 19% of female respondents were having secondary level of education. Whereas, 10 % of male and 7 % of female respondents were having education at the level of graduation and above.



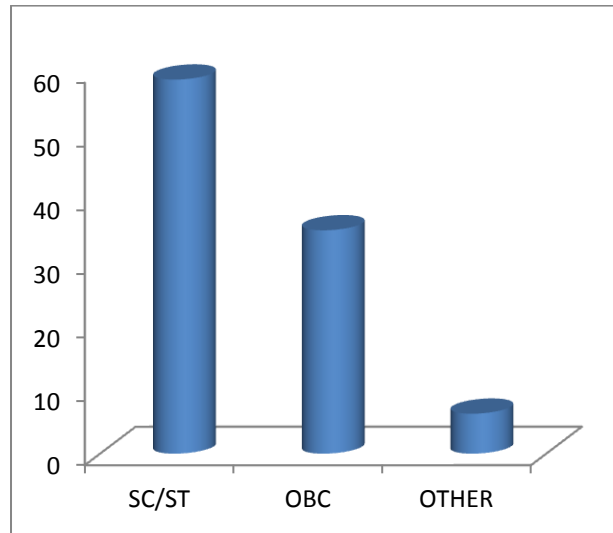
**Figure 83: Education Status of the Respondents**

**Religious Status and Caste, Family Structure of the Respondents:** Religion of respondents in Sonbhadra district depicted in Fig 84. About 95 % of respondents were Hindu and 4 % were Muslims. Other religious community is 1%. Caste status of Sonbhadra mining site depicted in fig 85. About 35% of respondents belong to other backward community, 59% belong to Schedule caste/ Schedule tribe community and rest comprised other community, Brahmin, chhatriya etc. Family structure is mainly nuclear type and among 84% belongs to the nuclear family type and 16 % were having joint family. Similar family structure was also observed in other cast also and 85 % of OBC and 69 % of Muslims and 57 % belonging to other caste's

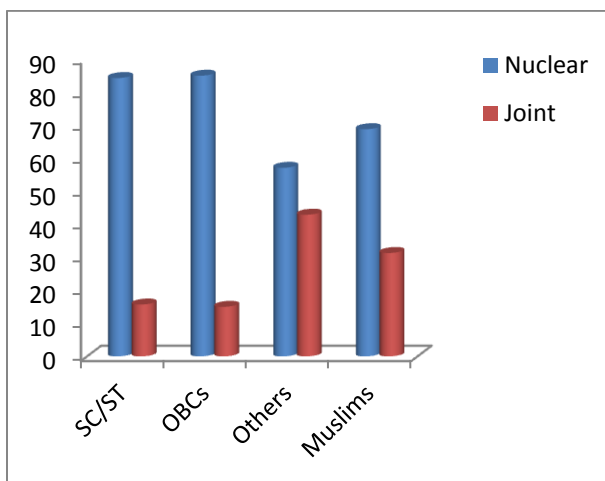
family. Rest of the respondents were joint type (Fig.86). Caste wise income is depicted in figure 87. In Sonbhadra district, SC/ST and OBC belongs to all income group, while other caste belong mainly to income lies in 100000/- and above group.



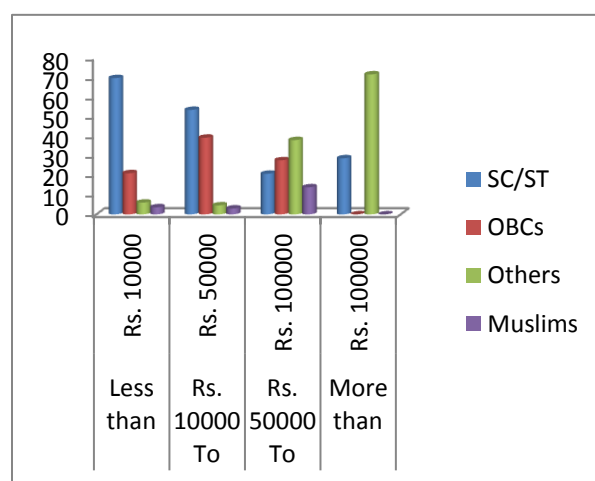
**Figure 84: Religion of Respondents**



**Figure 85: Caste Structure of Respondents**



**Figure 86: Caste-wise types of family**

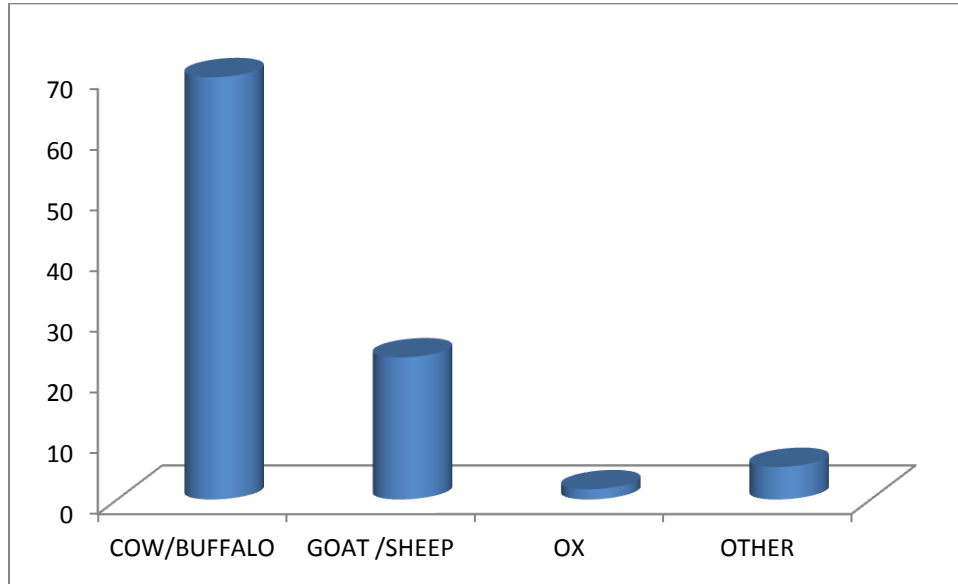


**Figure 87 Caste-wise annual Income**

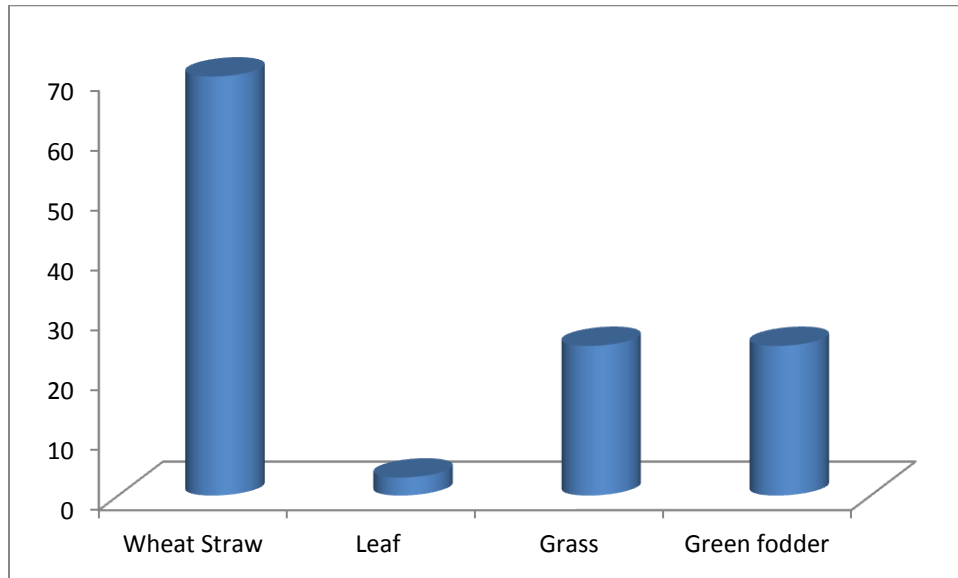
**Dependency on Forest:**

Local people depends on forest for their fodder supply for their livestock population and fuel wood etc. Livestock population are basically milk producers cow and buffalos (70 %), sheep and Goats (23%), Oxen (2%) and other (5%) (Fig 88). However, a major portion (70%) of fodder requirement is fulfilled by wheat straw. Green fodder (50%) is also fulfill the requirement of

fodder. Livestock belonging to lower community depends on grazing in forest area and leaves of forest trees (Fig 89).

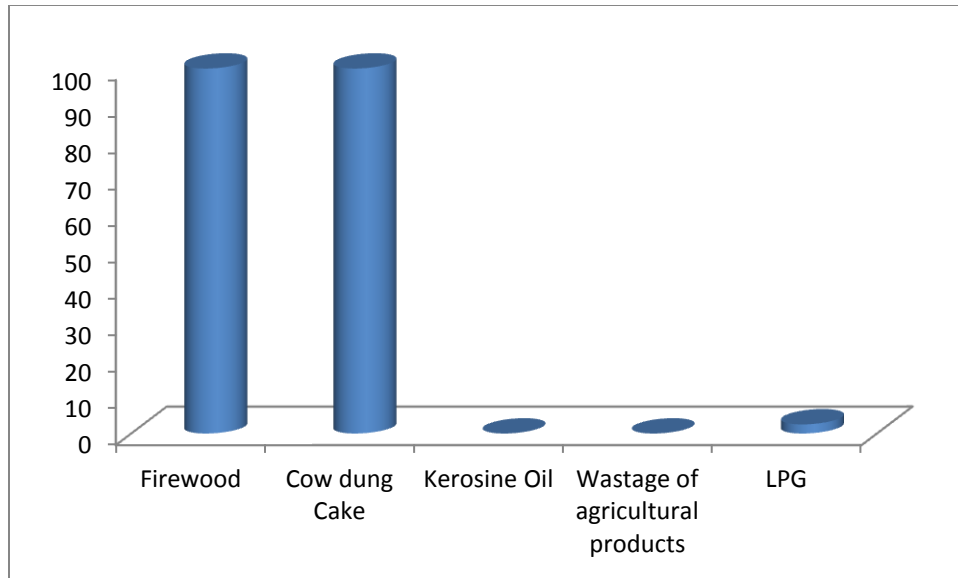


**Figure 88: Livestock population**



**Figure 89: Type of fodder used for livestock**

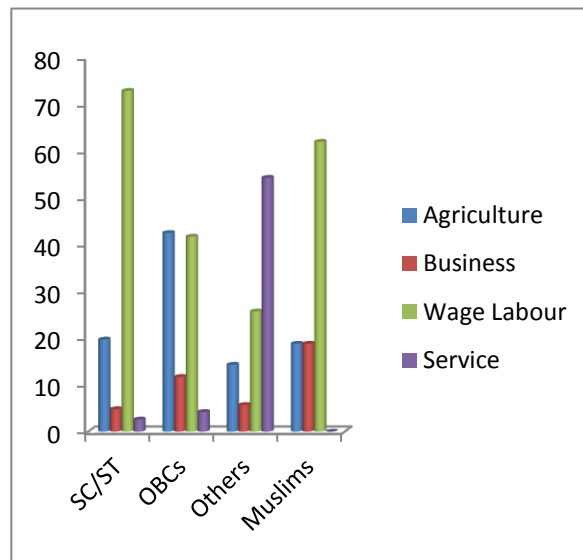
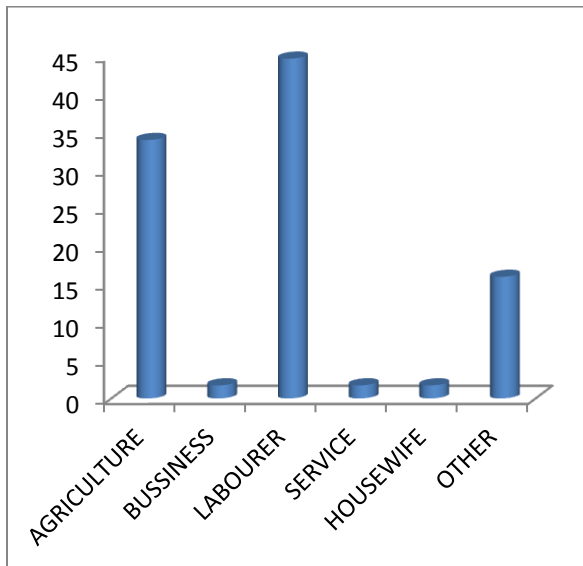
For fuel, mainly depends on firewood and cow dung cake. Only few respondents were using LPG for their fuel demand (fig 90)



**Figure 90: Type of fuel used**

**Occupation of respondents:**

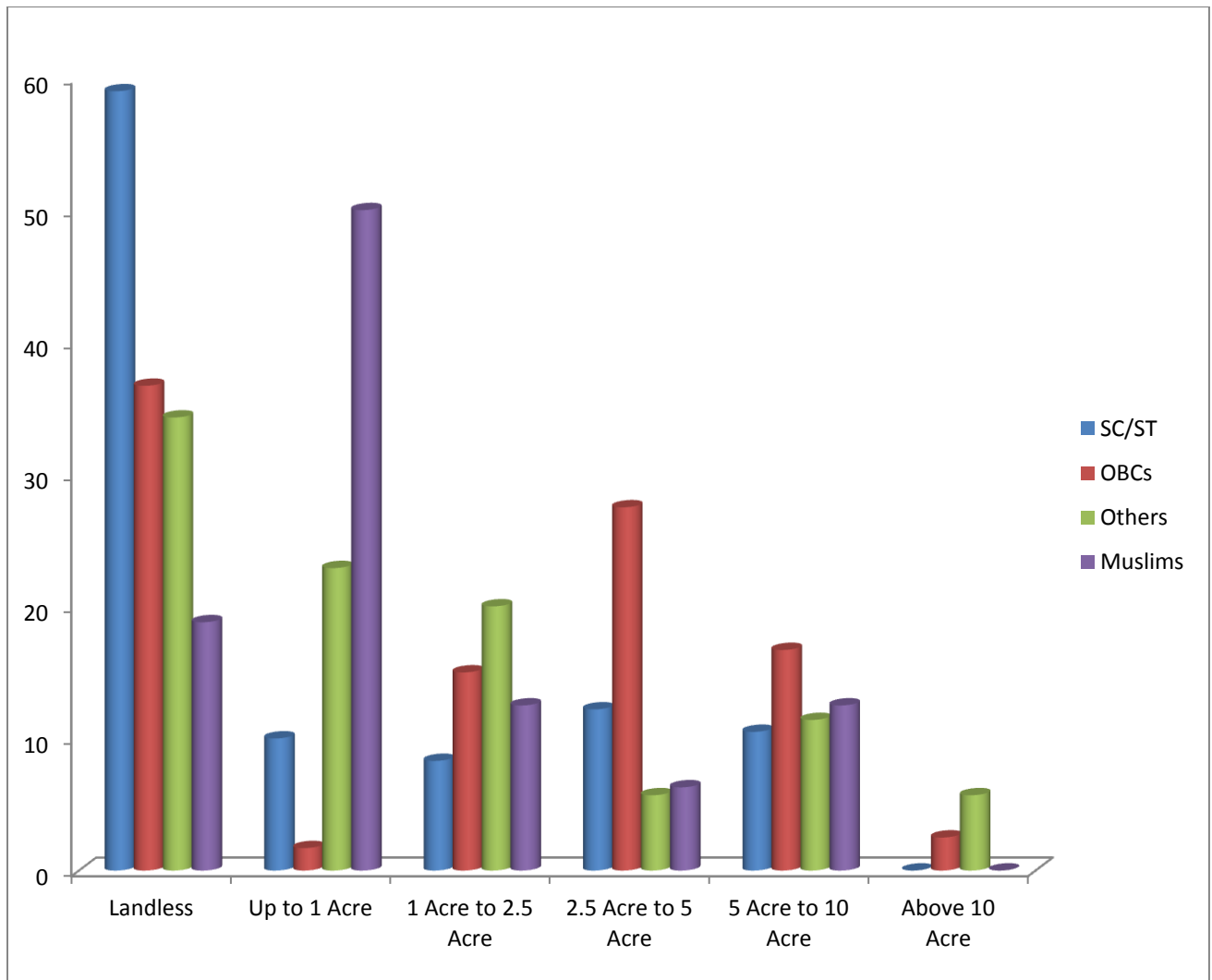
As shown in Figure 91, 34 % of the respondents were engaged in farming as their main occupation and 16 % of respondents involved in other occupation. 45 % of the respondents were engaged as laborer in mining. Only 2 % of the respondents were engaged in service and about 2% were engaged in business and trading and the remaining were engaged in other occupations.



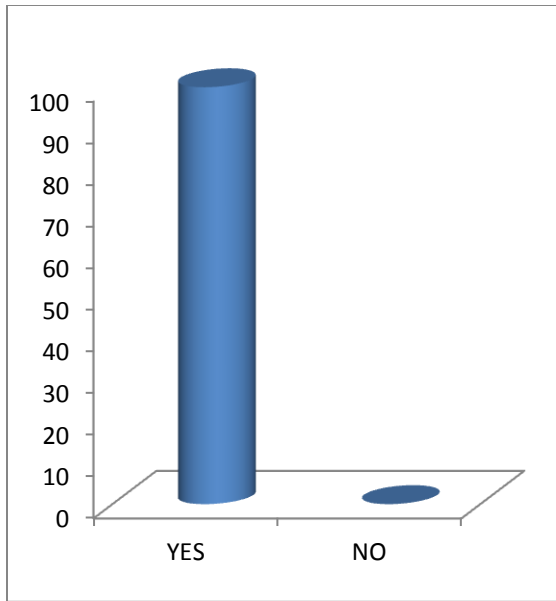
**Figure 91: Occupation of the Respondents Figure 92: Caste-wise Occupation of respondents**

Caste wise occupation is depicted in fig. 92. Among SC/ ST and OBC, main occupation is as wage labour in mining, in construction and farming, whereas service is main occupation for other case.

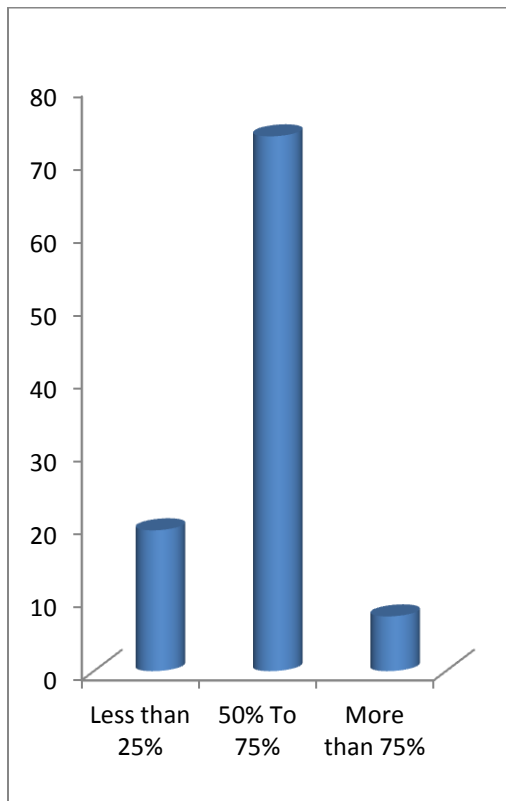
**Caste-wise Land holding Pattern:** Caste-wise Land holding is depicted in figure Fig 93. Major population of SC/ST (59%) belongs to landless category. About 50% of Muslim community belongs to marginal category, whereas land holding pattern in OBC varies from landless to 10 Acre. Only 17% others have land holding pattern ranging from 1 Acre to above 10 Acre (Fig 93).



**Figure 93: Caste-wise Land holding Pattern**

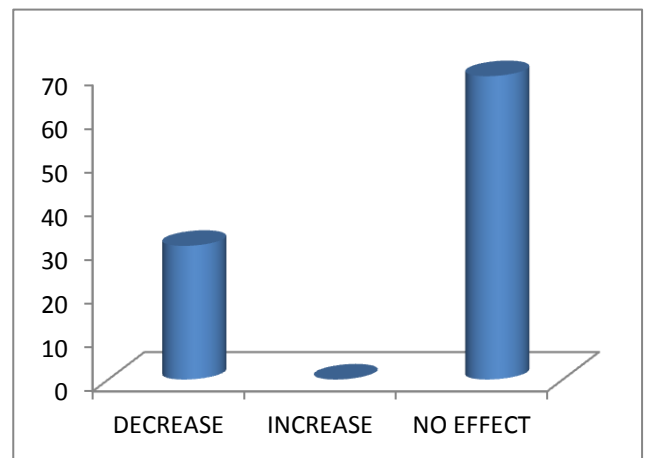


**Figure 94: Decrease in Forest in Area ?**



**Figure 95: Extent of Forest in Vicinity Area**

In vicinity of the area, the decrease in forest area is reported by major of respondents (100%) in Sonbhadra district (Fig. 94). Extent of forest in vicinity is about 50 to 75 % as reported by 73% of respondents (Fig 95). About 83 % respondents accepted about adverse impact of mining on forest and according to them the forest area is decreased after mining. One of the most severe impacts of mining has been the changes it has brought to local land use patterns and concurrently its landscape. It has been found out that maximum land diverted for mining activity is either forest land, agriculture fields or common grazing land. According to about 69 % respondents, the forest area not affected due to mining, according to them effect of decrease in forest is mainly due to various illegal activities and unplanned mining activities. NCL and J.P. Industry were also actively involved in reclamation of mining overburdens (Fig 96).



**Figure 96: Impact of Mining in Area on Forest**

### Type of Mining in Sonbhadra:

Stone Mining in Sonbhadra was developed during long course of time as small-scale cluster and lease owner were involved in mining. Jai Prakash Industries also involved in mining of cement stone material. Northen Coal India also involved in coal mining. These companies were involved in mining systematically. In almost all cases, mining is open cast which involves digging of pits and hillside excavation and is responsible for developing an undulating dangerous landscape. It laso leads to large-scale devastation of soils. With such mines, the land surface over a considerable area is destroyed, and what is left behind may be unstable land, causing landslides, erosion, siltation, and polluted water. It disrupts ecosystems, scars the landscape, and destroys microbial communities resulting in degradation of forests. Quarries/pit created and artificial hills formed during mining operation such as deposition of overburden are a major problem in the area. Such land is generally useless after the mining ends and may continue to cause environmental problems stretched beyond after the mine has been closed. However, restoration programme are being run by the mining companies. About 71% mining is open cast, only small portion (29%) is contributed by sand mining from river Son and Kanahar(Fig 97). Stone, gitti, boulder mining is 76%, sand and morum contributed 22% and rest is sand mining from river and 2% coal(Fig 98). Major portion of coal mines under NCL falls under MP.

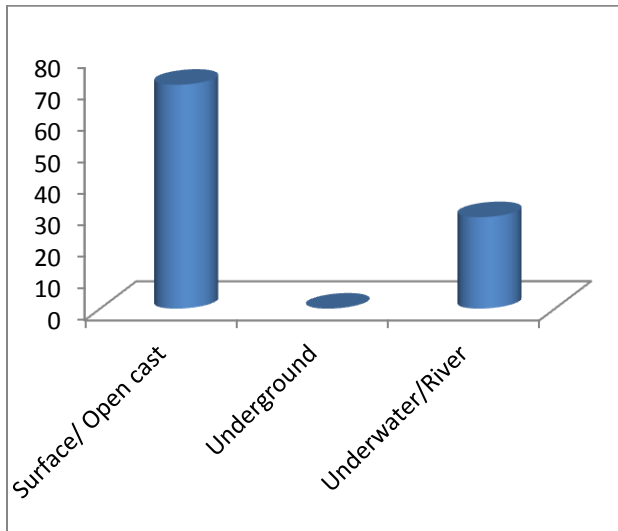


Figure 97: Type of Mining in Allahabad

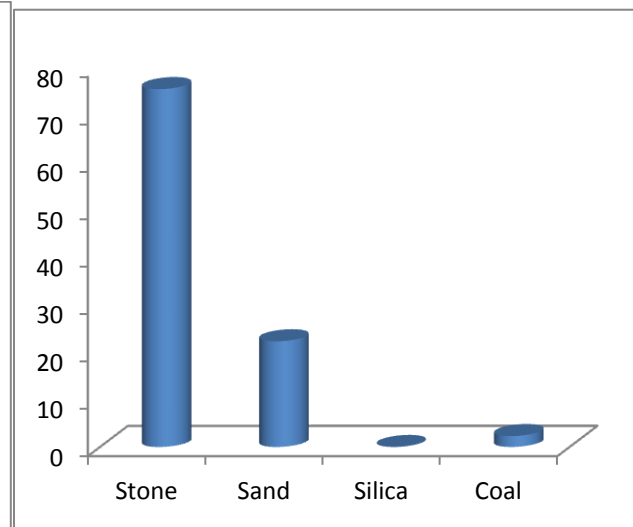
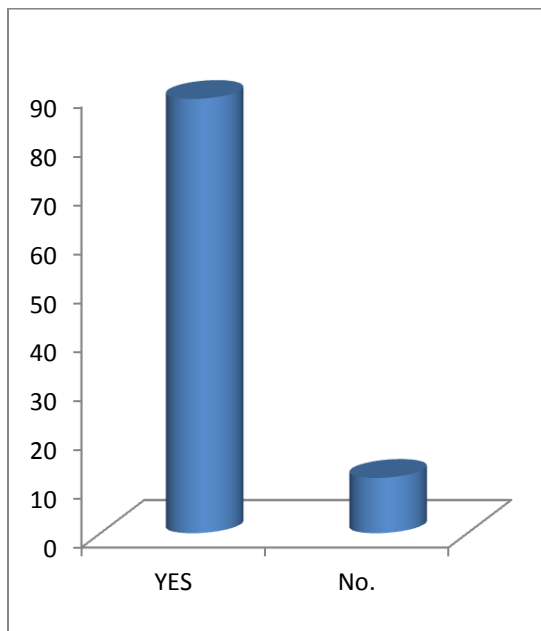


Figure 98: Type of Mining product

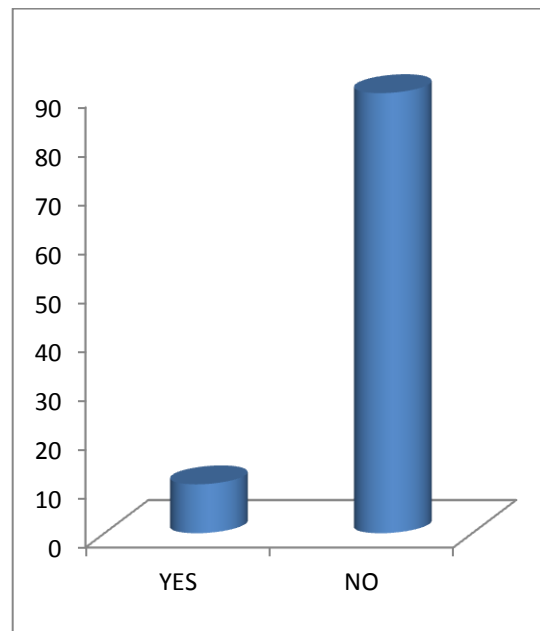


### Awareness about Forestry Programmes and Mining Policies:

Regarding the awareness about Forestry Programmes, most of the respondents (89%) were aware about the programmes run by Forest Department and 11 % were unaware about the forestry programmes (Fig 99).About mining policies and rules regulation on 10%, a very little number, were aware and large populations (90%) were unaware (Fig 100).



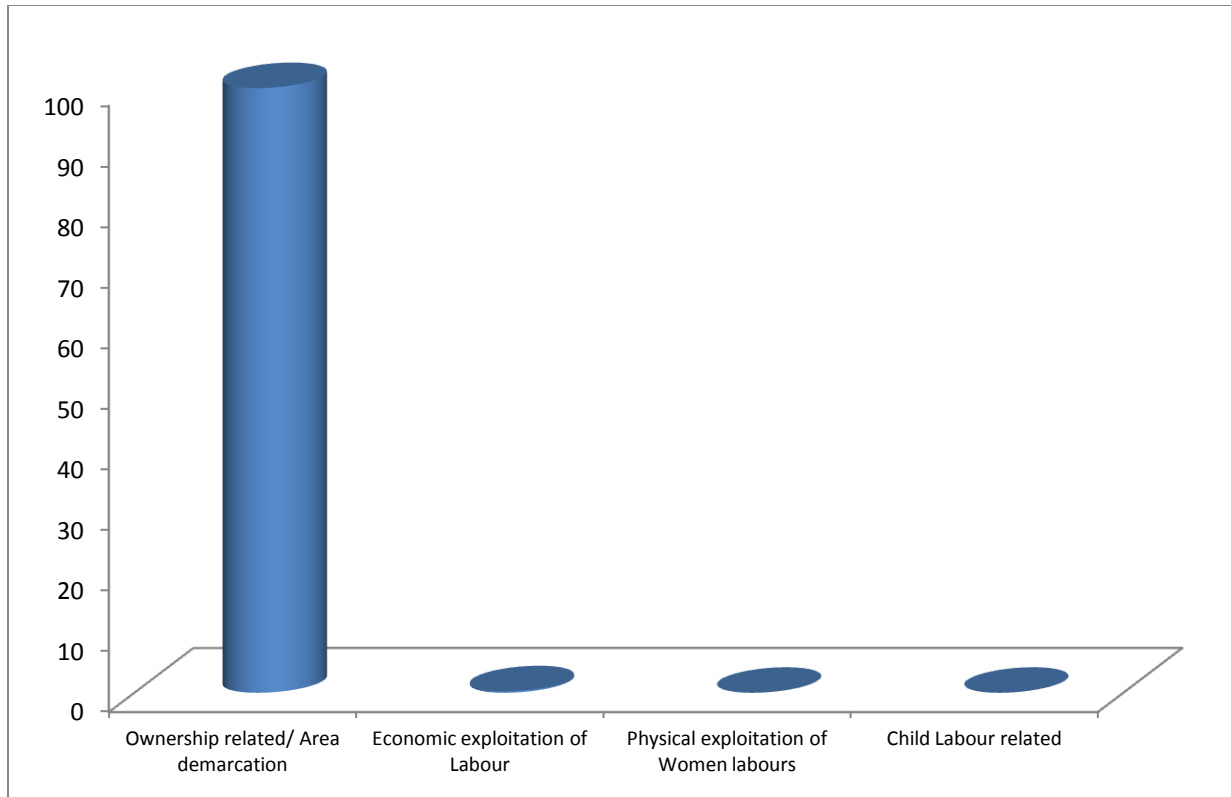
**Figure 99: Awareness about Forestry Programmes**



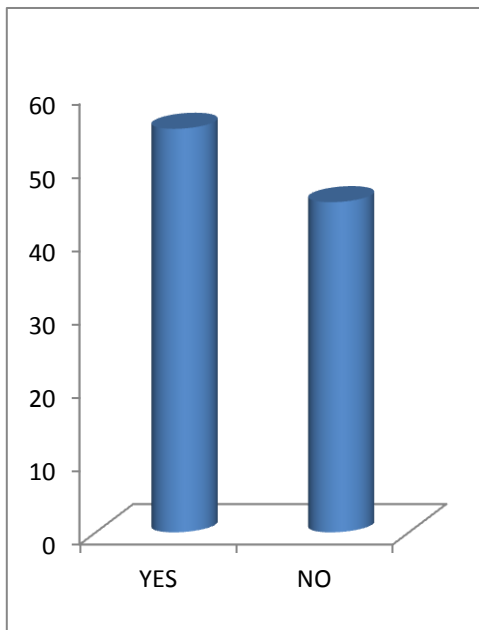
**Figure 100: Awareness regarding mining rules & policies**

### Dispute in Mining and Illegal Mining:

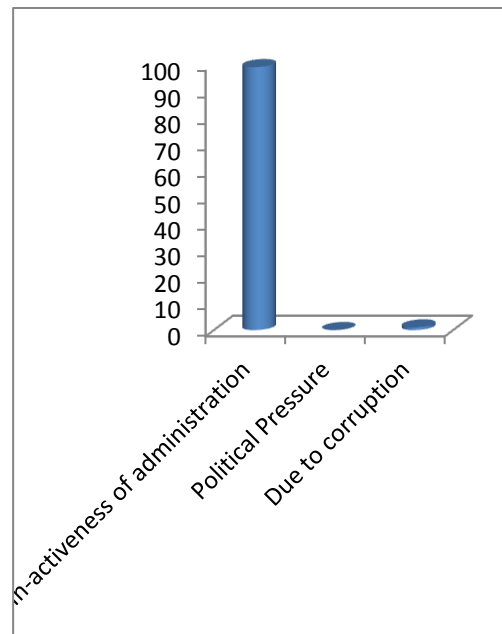
Mining is responsible for the generation of several disputes. Major disputes were related with ownership and demarcation related problem (99.75). While small portion (0.25) was related with economic exploitation of labour involved in mining (Fig 101).Occurrences of illegal mining was reported by 55 % of respondents (Fig. 102). For illegal mining area, 99% respondents accused to in-effectiveness of administration was the major reason of illegal mining while 1 % to corruption for illegal mining (Fig 103).



**Figure 101: Type of Major Dispute in Mining**



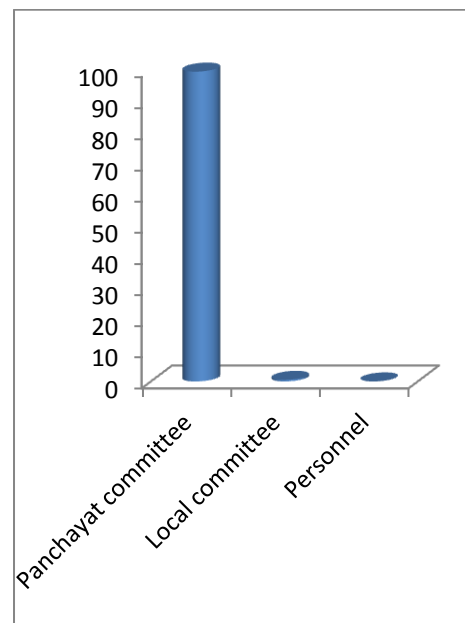
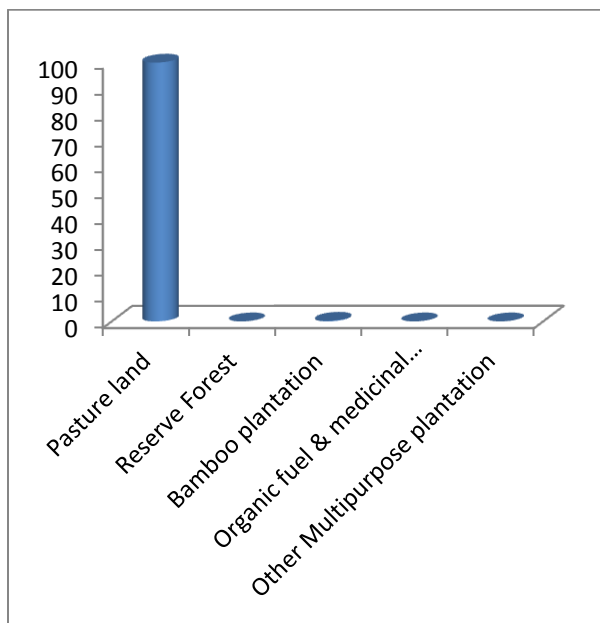
**Figure 102: Is there any illegal mining?**



**Figure 103: Reason of illegal Mining**

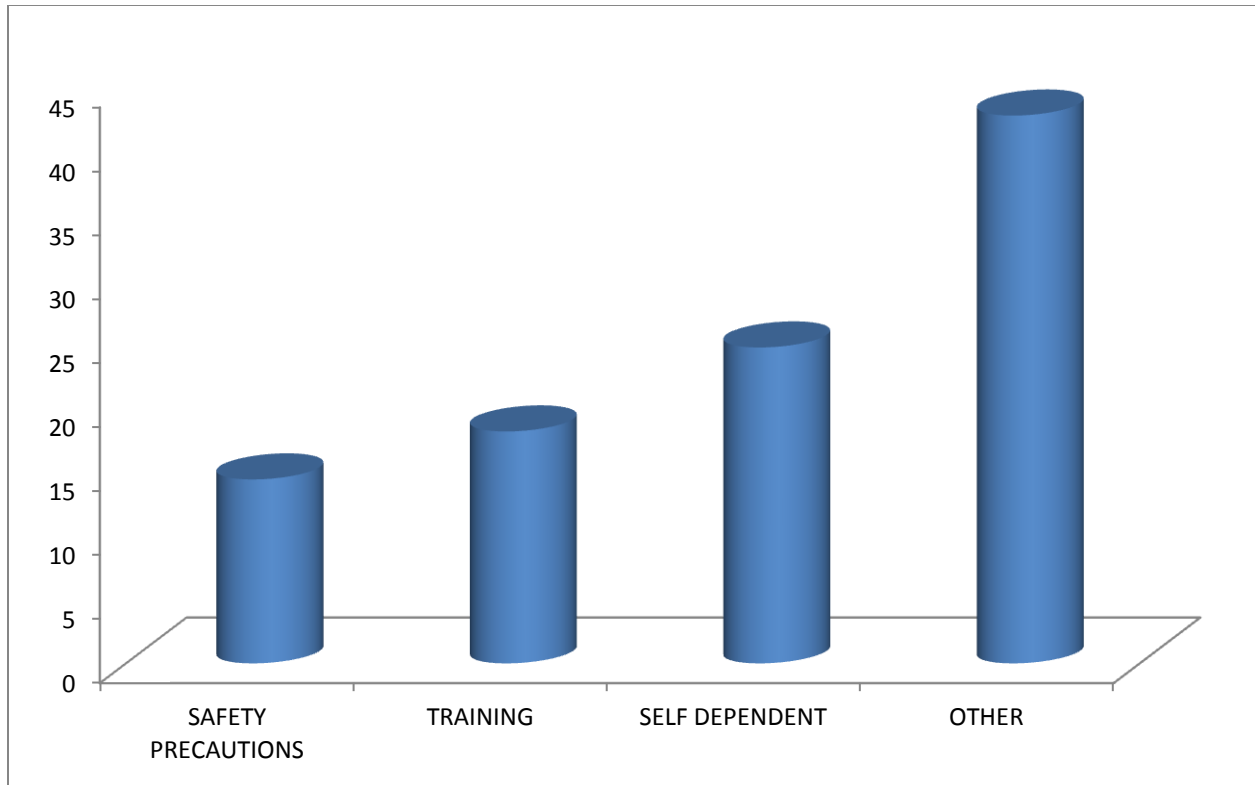
### Land Use Preference after Closure of Mining:

Preference of post mining land use were questioned. In Sonbhadra district most of the respondents ( 99.75%) were preferred the development of a pasture land one mined land available for grazing to their livestock, since they were unsatisfied by the availability of fodder for their livestock. Whereas only 0.25 % of respondents preferred to develop Bamboo plantations on mined land (Figure 104). According to 99.5% of respondents recommended to management of post mining land restoration by Village Panchayat Committee, while only 0.5% recommended the management by local committee formulated by Forest Department (Figure 105).



**Figure 104: Preferred Post mining Land use**      **Figure 105: Management of Post- Mining Land Restoration**

On issue of women safety, most of the respondents (43%) suggested different ideas for women safety. While about 25% of respondents relied on self dependency for women safety. About 18 % respondents recommended the requirement of training to the women for their safety. According to the 14 % of respondents suggested to adopt safety precautions for women safety (Fig. 106).

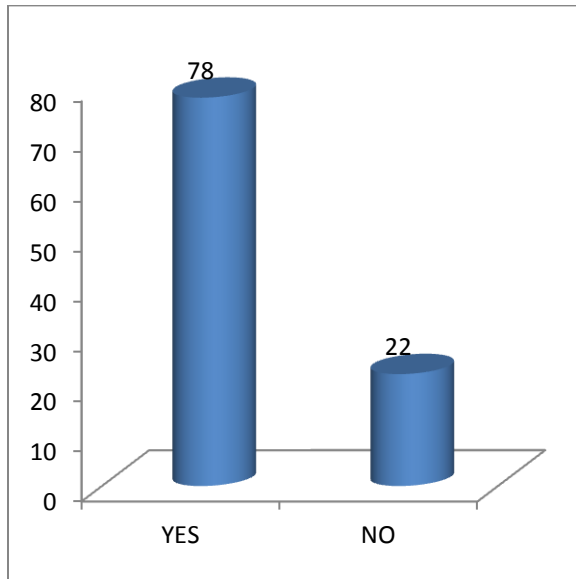


**Figure 106: Issues on women safety in mining**

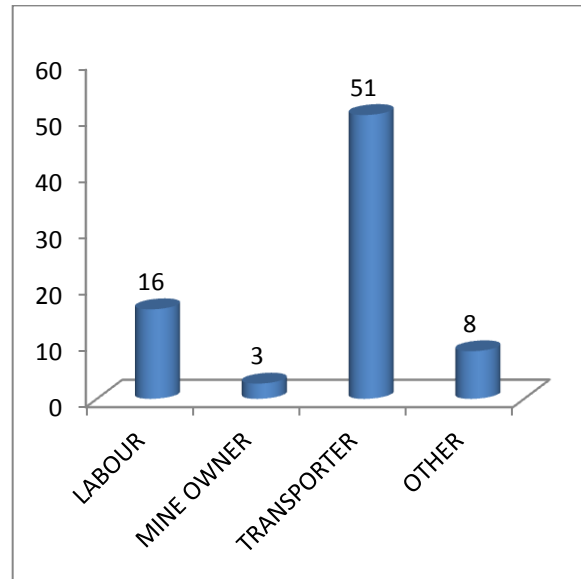
### **Dependency of Local Populace on Mining:**

The issue of whether communities would benefit/ dependent from/on mining or not which might be determined only by the degree of involvement of the local community. Mining has both negative and positive aspects. The positive aspects include its economic contribution and social benefits to the mining community (i.e. income generation, employment and support of family livelihood). On the negative side are environmental degradation, pollution, health problems and other negative social and economic impacts. The aim was to gain an initial overview of local livelihoods and how they are impacted by quarry activity and mining closure. About 78% people were dependent on mining for their livelihood and 22% depends on other sources for their livelihood (fig 107). As far as type of dependency on mining was concerned, out of this 16%, about 22 % were involved as labourer, 51% as transporter, 3 % as mine owner and 8% were dependent on mining in various ways, either involved as middle man or selling etc. (Fig 108). As far as effect of closure of mining on livelihood was concerned on the livelihood, about 62% respondents were getting affected due to mine closure (Fig 109), out of which, livelihood of

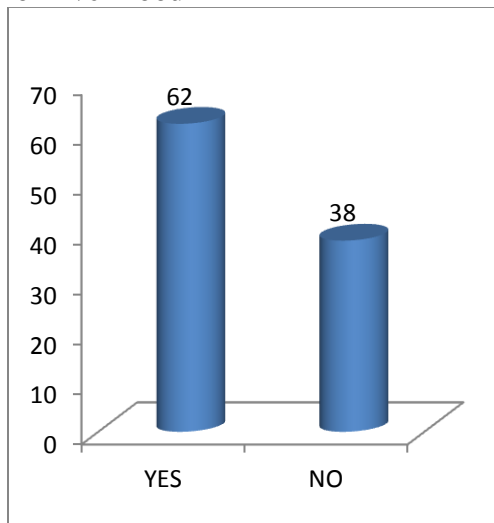
37% of respondents were getting affected 100%, whereas 15% were affected 50 to 100% and 9% were getting affected by 50% (Fig 110).



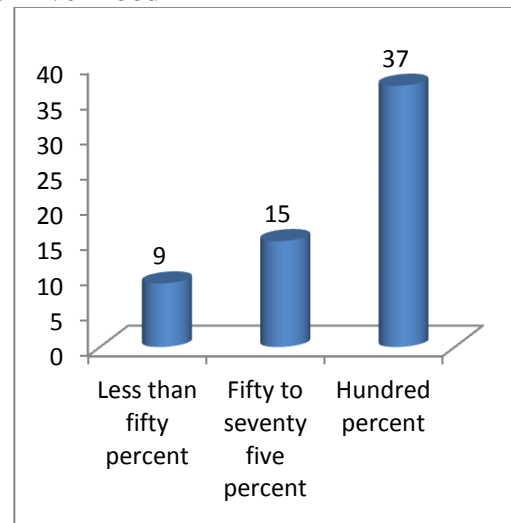
**Figure 107: Dependency on mining for livelihood**



**Figure 108: Type of dependency on mining for livelihood**



**Figure 109: Effect of closure mining activity on livelihood**

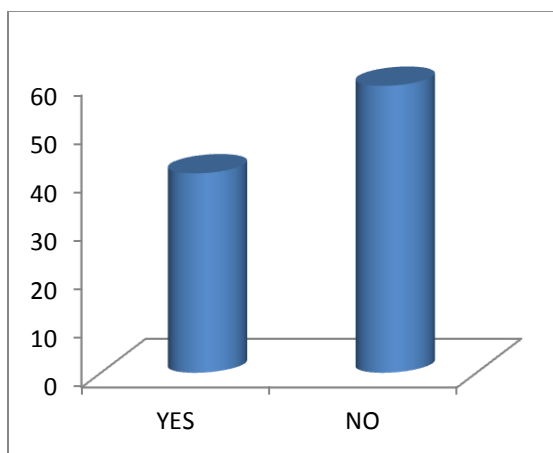


**Figure 110: Extent of effect on Livelihood**

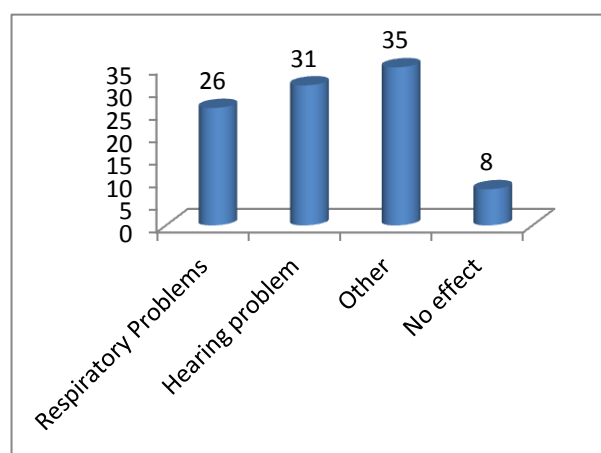
**Health Hazards and Safety Adopted:**

The health hazards and degeneration of the health conditions of local populations, whether involved in mining or not, is one of the most serious impacts of mining in Sonbhadra

district. The health and safety problems vary from one mineral to the other, from the technology used, type of mining- open cast to underground - and the size of operations. The lands, water bodies, air and environment are polluted due to constant release of chemical wastes, dust generated by blasting and excavation, and the dumping of mine wastes and over-burden in the surrounding lands and rivers. Even people who are not working in the mines are constantly exposed to various respiratory illnesses due to inhalation of dust particles and experience multi-functioning of various sensory organs, which has a long-term impact on their reproductive health. Noise and dust pollution affects women the most during pregnancy. Also the presence of metals like fluoride, manganese, nickel and sulphate are high in concentration which affects mostly the pregnant women and the foetuses. And the most common diseases among them are tuberculosis, cough and cold, malaria, skin diseases, diarrhoea, staining of teeth, joints pain, arthritis, lethargy etc. (Priyadarshi, 2010). At workplace, mine labourer are mostly involved in the crushing, sorting and dusty duties by working in the milling and processing units with limited protected clothing or equipment. While working in this atmosphere, their continuous exposure with the toxic and polluted air is leading to complicated health implications includes various lung diseases and even varied forms of cancers, silicosis etc (Das, 2015). About 41 % respondents responded that safety precautions were being adopted during mining, while 59% respondents denied about the safety precautions (Fig 111). In response to the health problems, about 26% mentioned that respiratory diseases were common in mine workers, while 31% and 35% mentioned hearing and other related problems, respectively (Fig 112).



**Figure 111: Safety Precautions adopted in Mining**



**Figure 112: Health related problems due to mining**

### Effect of Mining on Agriculture:

Mining practice created an irregular overburden disposal which resulted in the creation of unproductive land. Effect of mining on agriculture is mainly due to dust generated from crushers, coal dust etc. which deposited on nearby agriculture land and reduce its productivity. Movement of vehicle for transporting the mining products also a reason of air pollution. It can be mentioned that mining activity has definitely affected the quality of soil (both physical as well as chemical) thus affecting the productivity & livelihood of people. About 100% respondents accepted the adverse effect of mining on the agriculture (Fig 113). About 100 respondents accepted the decrease in agriculture production (Fig 114).

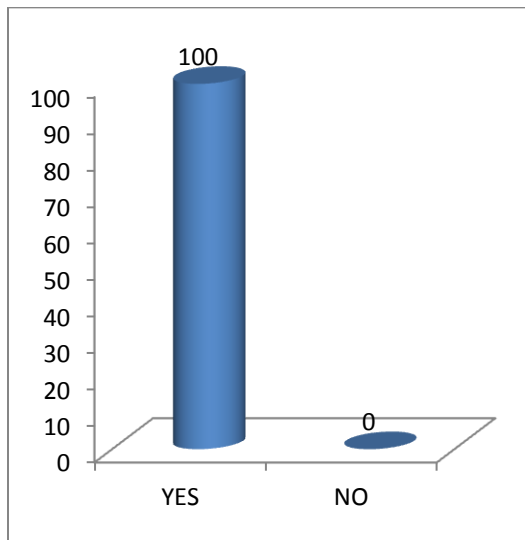


Figure 113: Effect of Mining on Agriculture

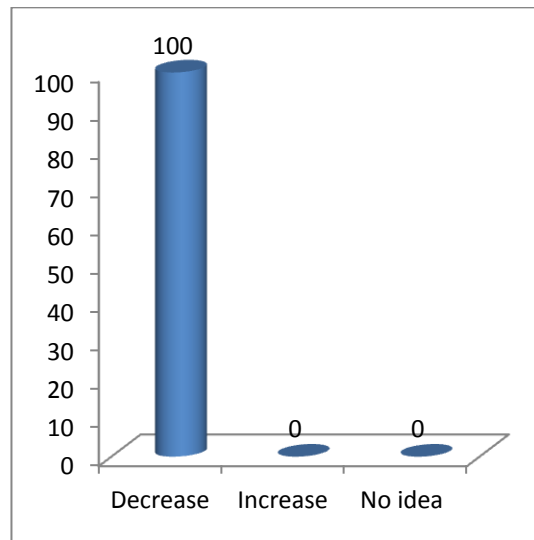
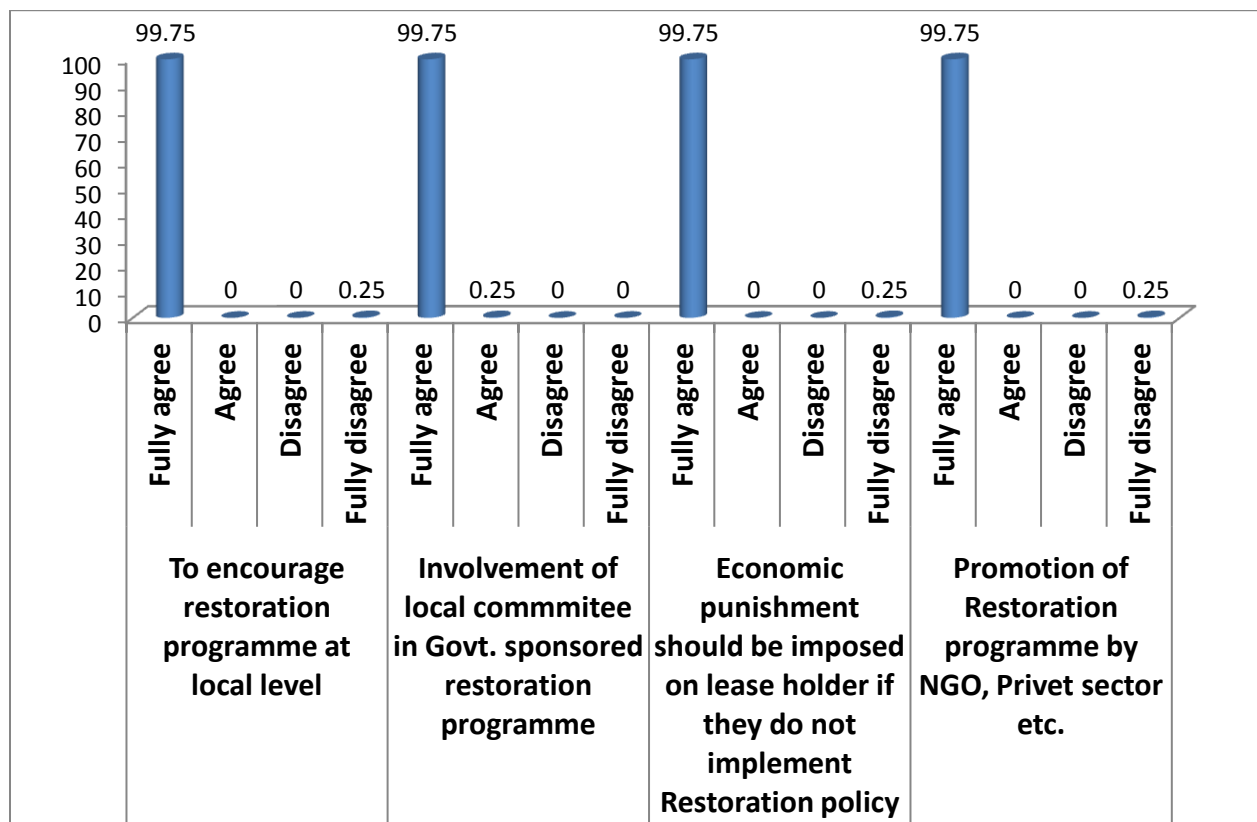


Figure 114: Effect of Mining on Agriculture production

### Perceptions of Respondents about Restoration related statements:

People suggested that both the mine owners and officials from the forest departments should establish a communication with the local community in which they operate directly in order to win the peoples' hearts and minds before initiating such restoration programmes. They felt that there is a growing need to educate the people about conservation and care for their environment, so that they can participate in redressing ameliorative activities of their immediate surroundings. Besides these, the respondents strongly pointed out the fact that mining activity in

the area was essential for their sustenance of the life and the matter of subsistence dominated over environmental concerns. Mining in the area has certain advantages which are very much pertinent to the local socio-economic structure and it has been developed as a means of sustained employment providing minimum life sustenance to a large number of people. Moreover, it has high employment potential for workers of all types, skilled, semiskilled or unskilled even in the remote rural areas (Dubey, 2010). Opinion of respondents about the restoration of the abandoned mined land were asked, they were fully agreed to the restoration programme at local level (99.75%), while 0.25 were disagreed. The involvement of local committee in Government sponsored restoration programme (99.75%), while 0.25 were disagreed. The implication of lease holder in case of violation of rules (99.75%), while 0.25 were disagreed.. However respondents (99.75%) were fully agreed with the promotion of restoration programme by NGO, Private sector level, but they suggested the proper and regular monitoring of non government body by Government Authority, while 0.25 were disagreed. (Fig 115).



**Figure 115: Perceptions of respondents regarding the restoration programme**



## Participatory Rural Appraisal Study of Sonbhadra Mining Area:

Major stone mining areas of Sonbhadra District is Billimarkundi, Dala, Julgul, Kalkhan, Chopan and coal mining site is located in Bina, Kakari, Khadia, Dudhichua. This district is basically very backward area despite the rich mineral resources it has and despite the revenues the state receives from mining of these rich mineral resources. Three major industries are also located here, HINDALCo Birla, NCL and JP Industries. Coal Mining activity is basically being done by NCL only. Mining is a capital intensive activity of the area having rather low level of other economic activities, e.g., agriculture, horticulture and forestry etc. The socio-economic profile of the local people was obtained from Participatory Rural Appraisal (PRA) tool which are depicted in Table 11 and 12 for stone and coal mining area, respectively. Stony, Plateau & Hilly terrain define the stone mining area, whereas coal mining area was having hilly area. PRA was conducted through meetings in nearby villages of mining area. The majority of the people are Schedule Tribes involved in mining. Most of them are landless labourers and therefore, they are placed at the bottom of the social heap. This area is characterized by rigid caste and class hierarchies that are expressed in terms of hostility towards the lower castes, frequent violence, threats, robberies and assaults on women. Literacy level was very poor and most of the females were illiterate. Literacy level of males is only about 50%, that to only up to the school level. Government primary schools are functioning in the villages. Most of the farmers were marginal type. Wheat, Paddy and pulses are main agriculture crop of this area. So there is no possibility of viable agriculture or any existing agro-forestry system. The local people rely mainly on the mining and exploitation of natural resources to develop their household economy. Some were also serving in companies located in the area. Mining in the area is providing employment directly or indirectly to people of the surrounding villages and their main occupation was mine labour in silica mines and in silica washing plants. Findings are briefed in table 11 and 12 for stone and coal mining sites.

**Table 11: Socio-Economic Study of Stone Mining Area of Chopan, Sonbhadra through Participatory Rural Appraisal Tool**

S. No	Parameters	Local villages Near Chopan, Sonbhadra
1	Site specification	Stony, Plateau & Hilly terrain

2	Location	35 kms from Roberts Ganj
3	Community Composition	Mixed
4	Literacy	50% Male have Primary Education, Most of the Female are Illiterate & Children are School going.
5	Occupation	Marginal Farmers, Mine related Occupations (Laborers, Transporters or Traders), Service & Business etc.
6	Monthly income (Approx.)	Rs.9000-15000/family
7	Agriculture crop	Wheat, Paddy & Pulses etc.
8	Fuel wood: a) Source: b)Need:	a) Dry branches of trees from local forest, Cow-dung cake & LPG /Stove in few cases. b) 2 to 3 Quintals/month/family
9	Livestock	Cows ,Oxen, Buffaloes & Goats etc.
10	Fodder source:	Agricultural Products, Wild Fodder Grasses & Leaves of Fodder trees etc.
11	Timber species required for local use	Mango, Bamboo, Babul, Shisham & Sal etc.
12	NTFPs used	Articles from Bamboo, Agarbatti, Collection of Tendu Leaves etc.
13	Marketing of NTFPs	Tendu Leaves' Marketing by Uttar Pradesh Forest Corporation.
14	Mining in Area	Stone mining by M/s JP Industries Ltd., Stone Mining & Sand/Morum Mining from Rivers.
15	Management of Mining area & Restoration	& Mining not properly managed, Only some meager Plantation Work was done by M/s JP Industries Ltd. Forest Department has been undertaking Plantations only in Forest Areas, mainly of Tree species. No Systematic Eco-restoration Efforts/Works in Mining Areas have been reported.
16	Choice of species preferred by Villagers	Shisham, Bamboo, Teak, Aonla, Mango, Karaunda, Mahua, Guava & Fodder species etc.

**Table 12: Socio-Economic Study of Coal Mining Area Near Renukoot, Sonbhadra through Participatory Rural Appraisal Tool:**

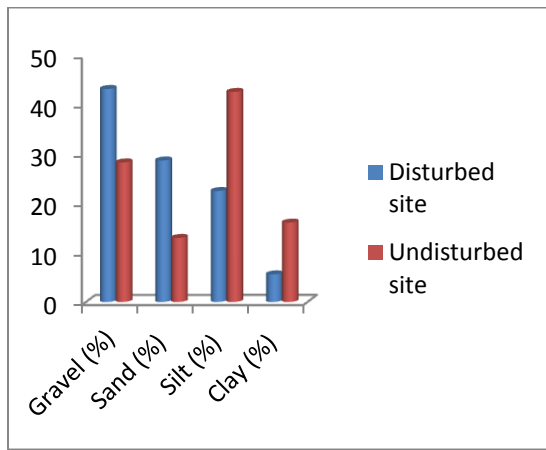
S.No	Parameters	Local villages of Near Renukut, Sonbhadra
1	Site specification	Rocky hilly
2	Location	55 kms from Rabarts Ganj
3	Community Composition	Mixed

4	Literacy	Most male are literate, Most of Female are Illiterate & Children are school going.
5	Occupation	Marginal Farmers, Mine labourers, Service & Business etc.
6	Monthly income (Approx.)	Rs.9000-15000/family
7	Agriculture crop	Wheat, Paddy & Pulses etc.
8	Fuel wood: a) Source: b) Need:	a) Dry branches of trees from local forest, Cow-dung Cake & LPG /Stove in few cases b) 2 to 3 Quintals/month/family
9	Livestock	Cows ,Oxen, buffaloes & Goats etc.
10	Fodder source for livestock:	Grazing from nearby forest, Hay from agricultural products, Wild Fodder Grasses & Leaves of Fodder trees etc.
11	Timber species required for local use	Mango, Bamboo, Babul, Shisham & Sal etc.
12	NTFPs used	Articles from Bamboo, Collection of Tendu leaves etc.
13	Marketing of NTFPs	Tendu Leaves & Medicinal Plants Collection & Marketing through UP Forest Corporation.
14	Mining in Area	Coal mining by NCL
15	Management of Mining Area & Restoration	Management by NCL. Restoration (Plantation) of Coal Mining Over dumps by the Forest Department. Forest Department has been undertaking Plantations in Forest Areas too, mainly of Tree species.  No Systematic Eco-restoration Efforts/Works in Coal Mining Areas have been undertaken.
16	Choice of species preferred by villagers	Shisham, Bamboo, Teak, Aonla, Mango, Karaunda, Mahua, Guava, fodder sp etc.

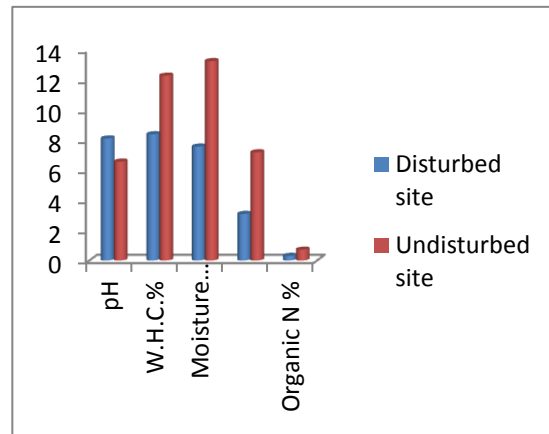
**Impact of Mining on Flora and Soil Characteristics:**

**Soil parameters of Mining Area of Sonbhadra:**

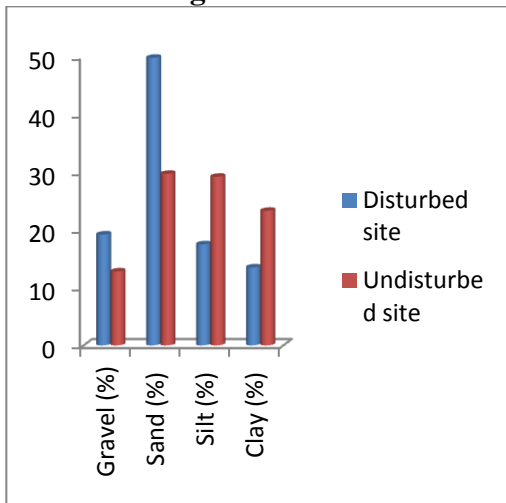
The mineral extraction through mining process drastically alters the physical and biological nature of a mined area. It causes extensive soil damage and by the process of removing desired mineral material, soil is either lost or buried by waste or is spoiled by both. It is essential to determine the soil status in the area to identify the impacts of mining on soil quality. Accordingly, a study of assessment of the texture analysis and physic-chemical parameters of soil from stone mining area and coal mining area has been carried out and depicted in fig. 116, 117, 118 and 119.



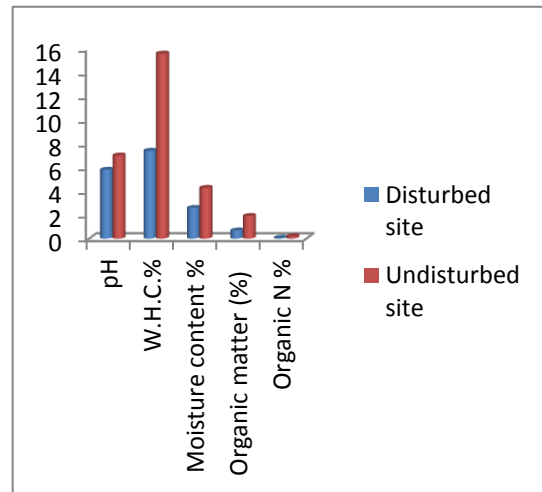
**Figure 116: Soil Texture Analysis of stone mining area**



**Figure 117: Soil physico-chemical Parameters of stone mining area**



**Figure 118: Soil Texture Analysis of Coal mining area**



**Figure 119: Soil Physico-Chemical Parameters of Coal mining area**

It has been found out that organic matter and Nitrogen content in all the soil samples collected from mining site are found to be less with comparison to the undisturbed which is mainly due to removal of soil layer and deposition of dust from mining. In all the samples it has been found out that increased solution of stable lechates of iron has affected the fertility of soil. Similarly the PH of the soil is slightly acidic. The moisture content in mining area soil is not found to conducive for agricultural activity. Water Holding Capacity and Moisture content of soil of mining area is low in comparison to undisturbed area and not suitable for the cultivation without irrigation (Fig 80) which is mainly due to the coarse sand and sandy part in mining area sample which contributes major part (fig. 116, 117, 118 and 119).

### **Impact of Stone Mining area on Flora :**

The term Floristic means the floral composition of an area. It may be correlated with Biodiversity. More simply, it is species richness of plants. Mining is an economic activity that withdraws resources from nature; it uses natural resource capital. The natural resource capital is nothing but the various ecological services that we derive from nature and our surroundings. In the process of mineral extraction, mining causes massive damage to the landscape and biological communities. The forests and mining are intimately and intricately linked (Dubey, 2010). Flora study was conducted for stone and coal types of mining in Sonbhadra and depicted in table 13, 14, 15 and 16. In 100 meter range mostly herbs were found, trees and shrubs were absent due to their felling for the mining process. In case of stone mining, total 13 species were reported in undisturbed site (100 m from mining site) (table 13). Being stony area less vegetation was found. Whereas in mining site only eight species were reported (table 14). Jaccard's Index of similarity index for stone mining area was 0.722; it means biodiversity was affected by 0.278. All species present at mining site were also reported at undisturbed site. In case of coal mining, total five species were reported in undisturbed site (100 m from mining site) (table 15). Whereas in mining site only four species were reported (table 16). In case of coal mining site, Jaccard's Index of similarity was 0.833; it means biodiversity was affected by 0.167. Mainly due to proper management of NCL.

**Table 13: Impact of Stone Mining on Vegetation at Sonhadra:Undisturbed Site Site (100m away from mining Site)**

S.No	Herb	Common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Imperata cylindrica</i>	Heptis grass, jap grass	Poaceae	100	35.67	8.33	28.69	37.02
2	<i>Sida cordifolia</i>	Bariyari	Malvaceae	100	19.33	8.33	15.55	23.88
3	<i>cassia tora</i>	chakwarh	Casaelpiniaceae	100	13.00	8.33	10.46	18.79
4	<i>Chrysopogan gryllus</i>	Kus	Poaceae	100	9.00	8.33	7.24	15.57
5	<i>Parthenium hysterophorus</i>	Chatak ch&ni	Asteraceae	100	15.00	8.33	12.06	20.40
6	<i>Sida cordata</i>	Fresh buti	Malvaceae	100	7.00	8.33	5.63	13.96
7	<i>Abutilon indicum</i>	Ati bala	Malvaceae	100	3.33	8.33	2.68	11.01
8	<i>Sida rhombifolia</i>	bahubala	Malvaceae	100	2.67	8.33	2.14	10.48
9	<i>Convolvulus arvensis</i>	Bhoomi chakra, hirnpag	Convolvulaceae	100	2.00	8.33	1.61	9.94
10	<i>Cynodon dactylon</i>	Dub	Poaceae	100	7.33	8.33	5.90	14.23
11	<i>Dactyloctenium aegyptium</i>	Makra	Poaceae	100	3.67	8.33	2.95	11.28
12	<i>Euphorbia microphylla</i>	Duddhi, Dudhiya	Euphorbeaceae	66.67	5.67	5.56	4.56	10.11
13	<i>Evolvulus alsinoides</i>	Shankhpuspi	Convolvulaceae	33.33	0.67	2.78	0.54	3.31

**Table 14: Impact of Stone Mining on Vegetation at Sonbhadra:At Disturbed Site(active mining site)**

S.No.	Species	Comman name	Family	Frequency	Density	RF	RD	IVI
1	<i>Imperata cylindrica</i>	Heptis grass, jap grass	Poaceae	100	13	12.5	20	32.5
2	<i>Sida cordifolia</i>	Bariyari	Malvaceae	100	10	12.5	15.38	27.88
3	<i>Cassia tora</i>	chakwarh	Casaelpiniaceae	100	9.67	12.5	14.87	27.37
4	<i>Chrysopogan gryllus</i>	Kus	Poaceae	100	9	12.5	13.85	26.35
5	<i>Parthenium hysterophorus</i>	Chatak chandni	Asteraceae	100	13.33	12.5	20.51	33.01
6	<i>Sida cordata</i>	Fresh buti	Malvaceae	100	5	12.5	7.69	20.19
7	<i>Abutilon indicum</i>	Atibala	Malvaceae	100	2.67	12.5	4.10	16.60
8	<i>Sida rhombifolia</i>	Bahubala	Malvaceae	100	2.33	12.5	3.59	16.09

**Table 15: Impact of Coal Mining on Vegetation at Sonbhadra:Undisturbed Site Site (100m away from mining Site):**

S.No.	Species	Common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Kryptostoma pectinatum</i>	Comb Habenaria	Orchidaceae	100	1.67	23.08	4.31	27.39
2	<i>Sacarum spontnium</i>	Kans grass	Poaceae	66.67	2.33	15.39	6.03	21.42

3	<i>Cynodon dactylon</i>	Dub	Poaceae	100	17.67	23.08	45.69	68.77
4	<i>Apluda mutica</i>	Bhanujuri	Poaceae	66.67	1.33	15.39	3.45	18.83
5	<i>Eragrostis cilianensis</i>	C&y grass	Poaceae	100	15.67	23.08	40.52	63.59

**Table 16: Impact of Coal Mining on Vegetation at Sonbhadra:At Disturbed Site(active mining site)**

S.No.	Species	Common name	Family	Frequency	Density	RF	RD	IVI
1	<i>Kryptostoma pectinatum</i>	Comb Habenaria	Orchidaceae	100	30	21.429	9.184	30.612
2	<i>Sacaram spontnium</i>	Kans grass	Poaceae	100	20	21.429	6.122	27.551
3	<i>Cynodon dactylon</i>	Dub	Poaceae	100	156.67	21.429	47.959	69.388
4	<i>Eragrostis cilianensis</i>	Candy grass	Poaceae	66.67	13.333	14.286	4.082	18.367

**Suggestions/Recommendations of Brainstorming Session with Stakeholders held at Sonbhadra District:**

A stakeholder meeting was conducted in Chopan, Sonbhadra covering all important issues related to Sanction of Mining Lease, Disputes related to Land, Mine Workers & Wages etc, Mining Policy, Rules & Regulation related issues, Social & Ecological Issues and other miscellaneous issues specified by stake holders. Issue were discussed in detail and following suggestion and Recommendations are come out of the brainstorming session:

- Improper discharge of duty by Government functionaries to control illegal mining. It should be made more effective.
- Provision of obtaining Environmental Clearance (ECs) should be exempted in case of Manual Mining of Boulders.



- Land Demarcation of Forest & Revenue (State) Land should be defined & demarcated on ground properly so that problems of Land Ownership Disputes can be minimized. If these areas are well demarcated & defined on ground, then mining forays in surrounding nearby forest areas by Mine Owners are minimized.
- Provision of Compensatory Green Belt Establishment/ Afforestation & post mining Eco-restoration is not being followed & being avoided by the Lease Owners/ Holders. It should be made obligatory.
- Approval for Crushers should be at the District level to avoid unnecessary delay at State level. Formalities should be completed at District level only.
- As the Available Stone Deposits' Depth are different on the basis of Geological Survey, Area specific Mining Depth has to be fixed & prescribed for each case of Mining Lease. Presently, it is 30-35 m depth in each case.
- As per the Section 4 by Supreme Court, the process of sanctioning the Mining Lease should be simplified & made easy.
- DPR/Data of Mineral Production should be recorded & maintained on daily basis & communicated to the Forest Department on Monthly basis, by the Mine Lease Owners/ Holders. Presently, there no Mineral/Mine Products' Production Data is available with Forest Department.
- Illegal Mining by the tribal people on Land occupied by them had been reported, which should be stopped.
- Problem of illegal mining in areas outside of the Sanctioned Mine Lease area is illegal & should be stopped.
- Foregone Provisions of collecting Transit Fees from Mineral/Mine Products' transporters during the Year 2010 need to be reinstated in order to have better prevention, control & supervision over Illegal Mining & Optimisation of accrual of State Revenue.
- Specific time limit should be fixed for completed the process of Environmental Clearance (EC) for sanctioning Mining Lease.
- Eco Sensitive Zone (ESZ) should be established & Mining should be allowed beyond permissible Limits. Eco Sensitive Zone (ESZ) should be mandatory for Crusher Establishment also.
- Period for Mining Operations in the sanctioned Mining Lease Area should be fixed & maximum period should be limited to 10 years.

- Rs.5/m<sup>3</sup> of Mineral/Mine Product, is paid by the Lease Owners to SADA (Shaktinagar Area Development Authority). This collected amount should be invested in infrastructural activities for the development of Mine and Surrounding Areas with proper consultation of local people.
- Part of the Collected Revenue from Minerals/Mine Products should be used for developmental activities.
- Mined Areas should be Eco-restored by the Mine Owners or the Mined Areas to be handed over to the UPFD for Eco-restoration. Eco-restoration Costs should be borne/deposited by the Lease Owners/holders.
- A Committee of Lease Owners/holders & Mine Workers should be constituted to resolve disputes between Mine Workers & Mine Lease Owners/holders.
- District Level Sanction Limit for the Lease Area (9 Acres) should be increased.
- Proper demarcation of Forest & Revenue (State) Land.
- Granting provisions for Sand Extraction/Mining in Areas falling under Forest jurisdiction should be resorted to for smooth river stream flow as per prevailing Acts & Guidelines.
- Government Working Agency like Uttar Pradesh Forest Corporation may be permitted for this with due permissions sought from the requisite levels.

## Summary and Conclusion

The socio-economic realm investigated the relationships between the people forest resources and environment through present study. The Socio-economic study has been conducted in mining areas of Allahabad, Mirzapur and Sonabhadra districts of Vindhyan region, UP. The Socio-economic survey has been carried out in the nearby human inhabitations (villages) of mining areas in order to study the existing resources of the area, social-economic structure of the community, employment patterns, income generation activities, dependency on forests, mining, impacts of mining, impact of mining closure on livelihood, preference of land use of mined out areas and species preferred for restoration by the local people along with information on other related environmental and socioeconomic aspects etc. The study has been performed in mining areas by using Participatory Rural Appraisal (PRA) tools and by Questionnaire based Surveys. Major findings, its conclusion, recommendations and future prospects have been summarized in forward section.

## **Major Findings of the Study and Conclusions:**

- Majority of the respondents were illiterates or just up to primary level or up to secondary level and only a minor portion was educated to graduate and above level and not a single household had reportedly attended any college or professional education.
- Inadequate education was mainly responsible for the poor awareness regarding the mining rules, policies and regulations and forestry programmes for development. They might be unaware of their rights.
- This inadequate knowledge of rules & regulations was mainly responsible for hindering the enforcement of proper regulations, monitoring in order to govern development and operation of restoration programmes. This inadequacy of knowledge could cause grounds for misconduct in the field of mining activities. Even they could not speculate any concern towards the environmental legal regulation or public participation in the decision making process.
- Moreover, this illiteracy might encourage mining companies/lease owners and contractors to take advantage of this situation in the communities to extract mining product wherever they deemed convenient without due consideration of socio-economic needs.
- Major population was wage-labourers and only small populations were engaged in agriculture, business and service sector. Agriculture as a source of occupation had lost its significance because of land acquisition mainly for mining; pollution and negative impacts of mining activities on agriculture.
- Major population was landless. Most of the farmers belonged to the marginal farmer category.
- This small land holding was responsible for their dependency for their livelihoods on mining and related ancillary activities.
- Majority of the respondent's livelihood depended on mining work and related allied activities. The economy of the nearby villages was mainly mine-based. Those who had lost their land of any kind in the mines became the beneficiaries to be involved in mining and related associated activities. Their dependency on mining was mainly as labour work in mining and the rest were engaged in mining related work, like mining, mineral production,

transportation, trading of minerals and mining products. Some of them were engaged as petty mine owners too.

- For their recurrent subsistence needs of fuelwood and fodder, people mainly depend on the nearby forests. The sources of fuelwood were basically dry branches of *Butea monosperma*, *Acacia nilotica* and *Prosopis juliflora* etc. The fodder sources for livestock were wild grasses, leaves of *Zizyphus* spp. *Acacia* species, *Azadirachta indica*, *Carissa carndus*, and leaves of *Pongamia pinnata* and *Butea monosperma* etc. in dry seasons.
- Through PRA study, it was observed that the people were not satisfied with the availability of fuelwood, fodder, and timber and the requirement of fodder and fuel were the two most important considerations among the local respondents. So the species meeting these two requirements were preferred largely for plantation by most of the people. Desi Babool (*Acacia nilotica*) was accepted by local people as a good source of tree based fodder, fuel wood and small timber. Dhak or Palash (*Butea monosperma*) for lac cultivation and making cups and plates from its leaves and Khair (*Acacia catechu*) for kattha making, tree based fodder and small timber, were also accepted by the local villagers because of their economic importance as NTFPs. *Pongamia pinnata* was suggested as plantation species due to its thick shade, lush green landscape, ecological, environmental and economic importance.
- The introduction of mining had not only enriched the source of revenue for Government but had also increased the source of livelihood for local communities, both directly and indirectly. It has also attracted lots of outsiders (Distant Labour) into its periphery to work either as permanent or temporary mine workers.
- Family structure was also affected by mining activities. Family was generally of nuclear type. This was mainly due to the mining interventions in the area and the behavioural trend had been shifted towards individualistic attitude. To fulfil their desire for economic independence, the villagers preferred to establish their separate nuclear households. Nuclear families had become popular in the mining affected villages instead of joint family. Most of the migrated labourers were also found to be having nuclear family structure.
- Majority of the respondents accepted the negative impact of mining on adjoining forest and agriculture. They reported that forest/tree cover has been decreased. The degree of impact,

however, varies in severity depending on type of the mine, mining methods and the geology of the area.

- Most of the people had mentioned that reduction in vegetation, climate warming, receding water table, air pollution, degradation of the area and effect on wildlife were the major impacts of mining. Shallow soil depth and stoniness of land, nutrient deficiency, poor fertility of the soil, low water holding capacity of soils, poor vegetation cover, degraded forests and low productivity of land etc. were identified by them as main indicators of land degradation due to mining. Therefore, they recommended tree species for plantation, which will improve the soil characteristics for bioreclamation of the area and provide Fodder, Fuel, Small Timber and Green Cool Shade as well. Therefore, the Nitrogen fixing tree species belonging to the Leguminosae family were recommended for the restoration.
- The dust particles/suspended particulate matter, generated from mining activities and stone breaking, stone crusher and grit (Gitti/Sized Stone Aggregate) production, handling and transportation operations, were found to be scattering to the neighbouring agricultural fields which were destroying the crops inimically and adversely affecting the agricultural productivity. Impact of mining on loss of arable farm soil fertility was also categorically identified as a causative factor for the decline in agricultural and forest.
- Sonbhadra region had been declared as Critically Polluted Area (CPA) by CPCB in the year 2010 which was found to be responsible for adversely and harmfully impacting the surrounding forest areas.
- Mining negatively impacted on floral biodiversity of adjoining forest area. About 50 to 75 % floral diversity was affected. Soil parameters were unfavourably affected by mining mainly due to change in soil substrata.
- Mining is associated with several ecological and environmental impacts which have a direct negative impact on health mainly due to air, water and noise pollutions. Recurrence of respiratory disease, hearing disorders, malaria and water borne disease like diarrhoea (bacteria), dysentery (bacteria or amoeba), cholera (bacteria) and hepatitis A (virus) etc. were common in human habitations/labour hutments/settlements nearby mining and allied areas.

- Blasting during open cast mining is also responsible for various life threatening injuries incurring to mining labourers during the intercourse with these perilous mechanical and/or chemical operations.
- Health hazards pertaining to stone dust and particulate matter (Air Pollution), noise pollution and toxicity of minerals such as Fluoride, Lead, Mercury, Arsenic and Cadmium were prevalent in local populace. Silicosis, TB, Fluorosis and Diarrhoea were common in these mining areas.
- Majority of respondents depended for their livelihoods on the mining and allied activities. Mining has both positive and negative impacts on the livelihoods of respondents. Though it raised the financial capital, standard of living, possession of household level physical capitals and improved some sort of human capitals also, but at the same time it diminished the natural resources, disturbed the community level physical capitals, modified the social and economic network ties etc.
- In one sphere, it provided all kinds of physical and infrastructural improvements but on the other hand, it alienated the people from their traditional agro-based livelihoods, artisan, handicraft and customary rural health vitalisation practices. Mining is a very short lived industry. The alternative means to sustain a secure livelihood is a matter of concern after the closure of mining.
- Illegal mining was also a major problem in this area.
- Majority of respondents wanted the implementation of Land Reclamation and Eco-restoration programmes after closure of mining, whether it would be implemented through lease owner, forest department or any private company, albeit, through involvement of local inhabitants, stakeholders, community organisations and NGOs.
- Most of the people had agreed for imposing strict economic punishment on mining contractors on violations of the terms and conditions of mining lease and non-implementation of Eco-restoration programmes. It had revealed their emergent information, knowledge and alertness regarding the vital need for conservation of their surrounding environment.

## **Recommendations:**

- To resolve the problems due to mass illiteracy, the local inhabitants should be educated regarding the rules and regulations, their environment, current government programmes, the role of forest, health hazards, requisite precautions and safety measures for human wellbeing, so that they can appreciate and take decisions and necessary precautions for the betterment of their sociological, economic, ecological and environmental needs.
- Their dependency on mining was mainly as labour work in mining, rest were engaged in mining related works, like mineral and mine waste handling, transportation and trading of minerals and mining products and petty mine owners. Since the livelihoods of majority of people will be affected by the closure of the mining activity, a provision should be kept for alternative employment after the closure of the mining activity. Alternative sources of livelihood should be generated. Skill development programme for the local populace should be organized, so that they can earn their livelihoods, even after mine closure. It may be executed through organizing trainings for making local Artefacts, Sericulture, Medicinal Plant Cultivation, harvesting of NWFP like Bidi Patta (Tendu Leaves) and Mahua (Mahua Flowers, Fruits and Seed), Bamboo Cultivation, Sewing etc. and implementing these Socio-economic activities scientifically for further Value Additions.
- Mining in the area had a significant impact on agriculture and forest environment of the area. To minimize negative effects of dust and particulate matter generated during mining and ancillary activities, provisions for a Buffer zone/Biological Filter Zone at the periphery (at least of 10m width) of mining area should be kept mandatory. Buffer zone/Biological Filter Zone should be established by planting suitable plant species which can absorb/adsorb this dust and particulate matter borne air pollution created by mining activity and consequently reduce its adverse effects on agriculture and forest environment.
- Mining in the area had a significant impact on adjoining forest area whereby both floral diversity and soil parameters were critically affected by mining. Creation of Buffer zone/Biological Filter zone area also minimizes this adverse effect of mining on forest. Scientific Management practices such as Probiotic Treatments with tree, shrub and grass planting and resultant augmented vegetative cover can restore the forest ecology.

- Stone Crusher Premises should be cleaned regularly to avoid resurgence of settled dust. Regular wetting of the ground within the stone crusher premises be adopted as an auxiliary air pollution abatement measure. Dust suppression by scientifically designed water sprinkling system on raw material/end/bye products at the equipment, storage, handling, transfer, loading and unloading and other points should be adopted as an supplementary air pollution control measure.
- Agro Forestry Practices and Tree, Shrub and Grass planting on the left over mining sites after mining closure should be encouraged as this has proven to dramatically increase the otherwise slow rate of natural forest succession by ameliorating unfavourable soil condition and providing a build-up of soil parameters.
- Mining also had health hazards. Mining has contributed to the prevalence of respiratory diseases among the mine labourers. To reduce occurrence of respiratory disease like TB, Silicosis etc., mining personnel and workers working in the mining areas shall be provided with protective respiratory devices like mask, filters etc. and they shall also be imparted adequate training, information and knowledge on safety and preventive health care aspects. Use of mask, filters and other health promoting precautions should be made mandatory.
- Open pits created due to mining should be filled up after mining and mining closure ensured on timely basis as this can help reduce the prevalence rate of mining related air and water borne diseases in the communities.
- Medical Camps should be organized by the mine owners, at least fortnightly, for the general medical health check-up of mine workers and surrounding populations. They should be educated to take preventive health precautions during mining activity.
- Majority of the respondents reported economic exploitation of labour and ownership related problems as the major disputes in mining. For dealing with economic exploitation of labour, Formulation of District Level Committee (DLC) has been recommended to decide minimum wages for different mine activities.
- Instead of any arbitrator, resolution of conflict/dispute should be carried out directly by the involvement of both authorities, mine owners, operators and mining affected communities.



- To resolve ownership problems, mining sites should be properly demarcated with proper Signboards carrying all the details of particular mining lease i.e. name of owner, sanction area, mining plan and sanction period etc.
- Illegal mining had been reported by majority of the people which can only be resolved through frequent vigilant monitoring of the area and by fixing hard punishment for the people getting involved in illegal mining.
- Provisions should be made to give much emphasis on Eco-restoration of area so that social, economic and ecological set up prior to the mining may be reinstated providing ecological and livelihood security.
- Eco-restoration of mined land should be made mandatory. Eco-restoration Land Use plan of mined land should be decided after the proper consultations with the local people and forestry experts/scientists. It should be done according to their socio-economic needs. Involvement of local people is recommended for sustainable reclamation of the mined land.
- A portion of revenue earned from mining in area should be reserved for the infrastructural development of the area directly. Residents of communities should be made benefited directly. A District Level Committee should be formulated in consultation with representatives of particular mining areas, to decide the developmental activities to be carried out in that area. This could improve their economic livelihoods and also enhance their commitments towards reclamation of abandoned mined out areas which can reduce the conflicts that exist between them and mine owners as well.
- All relevant stakeholders in the mining sector including Forest Department, Environmental Department, Mining Department, District Administration, Mine Owners and Land Owners among others should strengthen collaboration among themselves for effective enforcement and compliance of the mining rules & regulations and implementation of Eco-restoration and other Development Activities post mining closure.
- Regular inspection of the mining areas is recommended and scales of extraction with permitted specifications especially, in terms of the depth of mining, should be regularly inspected and monitored for each sanctioned mine lease to prevent environmental hazards and also to check illegal mining.

- Eco-restoration of the mined land will be ensured by the mine owners and they should adhere to Eco-restoration processes and guidelines. Provision of strict punishment/penalty should be there in case of failure to adhere to these guidelines.
- A portion of Revenue earned from mining should be reserved for Research purposes, at the district level, for developing suitable methodology to Eco-restore particular mining sites.
- Generally, mining alone may not have caused the degradation of the mining sites; it may be as a result of a combination of other factors. Negative activities such as perennial annual bushfires, over- cultivation of lands, over-grazing, tree felling and other fuel wood requirement may have also contributed to this degradation. This, therefore, calls for collaboration between all stakeholders to enforce local level byelaws in order to regulate people's activities in respect of utilisation of environmental resources.
- Sustained education is required to prevent and control environmental degradation in mining sites. Sanctions and Penalties should also be included in the byelaws such that offenders of the laws will be punished accordingly. Forest Department, Environmental Department, Mining Department, District Administration can play leading roles in the facilitation process. This will help develop pragmatic byelaws towards regulating mining activities more effectively in order to improve ecology in the area.
- Forest Department should be an integral part of the District Level Monitoring Committee (DLMC) for the Sanctioned Mining Leases as presently the role of UPFD is limited only for the requirement of issuing NOC for sanctioning the mining leases. This District Level Monitoring Committee (DLMC) should frequently visit, monitor and review all the mining and post operations, with respect to whether the norms fixed for the sustainable mining is being properly followed by the lease owners or not. It is essential for the Ecologically and Environmentally Sustainable Operations of Mining in the sanctioned mining lease areas.

#### **Recommendations for Future Research Works:**

- i. Similar studies should be extended to Districts of Bundelkhand Region. Results obtained from these would then be more representative as far as mining in Uttar Pradesh is concerned. This would also give a broader picture of the problem so as to ensure that a more holistic approach is adopted to amend the mining policies.
- ii. Further research would also be required to assess mining impacts on below-ground biomass in the district.



## Coal Mining at Sonbhadra District



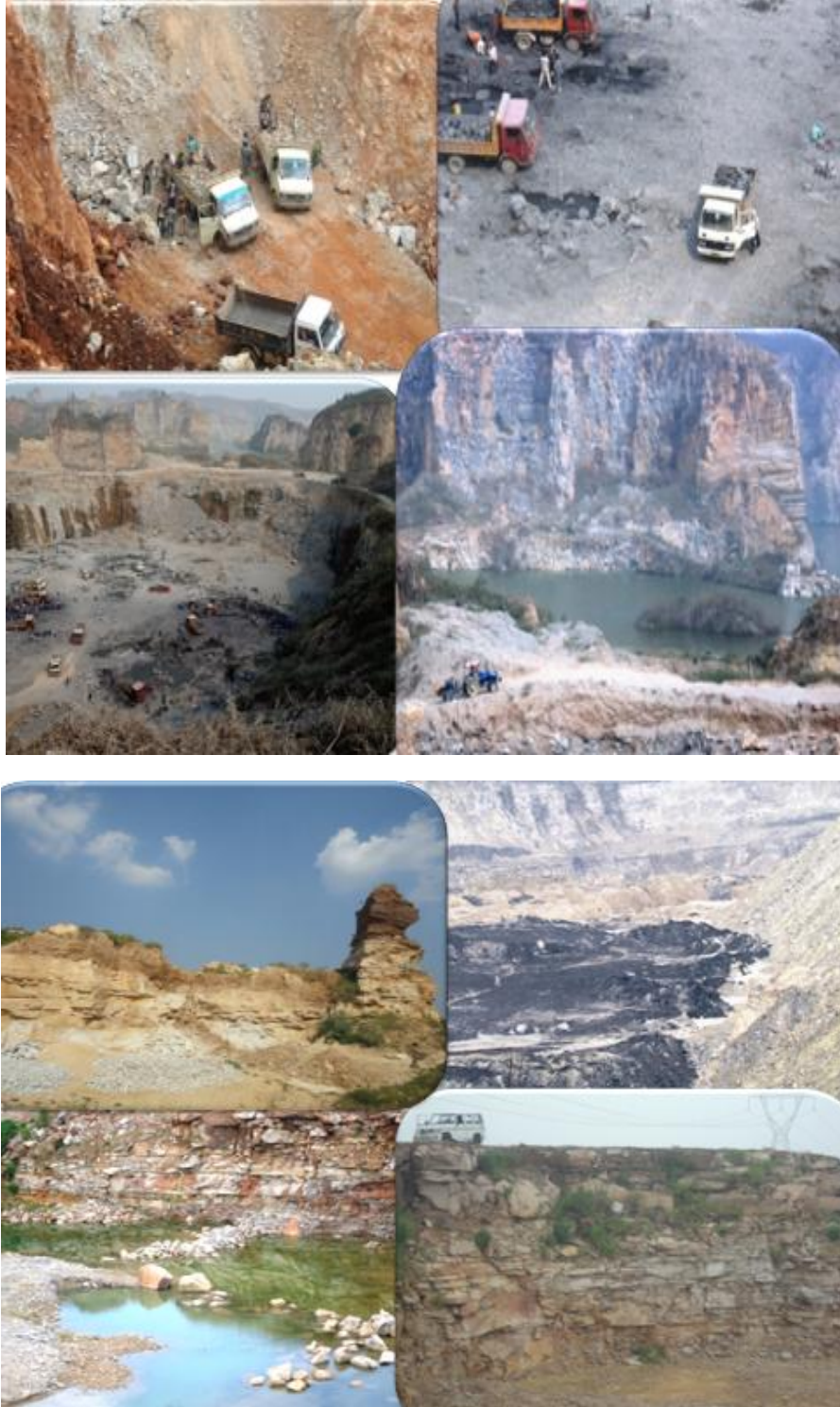
## Silica Mining at ShankarGarh, Allahabad



## Stone Mining in Allahabad, Mirzapur and Sonbhadra



## Stone Crushers and Dust Pollution



## **Dangerous and Undulating landscape created due to Mining**



## Flora Study of Mining Area



## Questionnaire Based Socio-Economic Survey



**Brainstorming Session with Stakeholders held at Mirzapur District**



**Brainstorming Session with Stakeholders held at Sonbhadra District**



## Brainstorming Session with Stakeholders held at Allahabad District



## Stakeholder Meeting cum workshop on 17<sup>th</sup> August, in Mirzapur



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## Annexure I



### सामाजिक वानिकी एवम् पारि-पुनर्स्थापन केन्द्र, इलाहाबाद

(भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद्, देहरादून)  
पर्यावरण एवं वन मंत्रालय, भारत सरकार, नई दिल्ली  
3/1, लाजपतराय रोड, नया कटरा, इलाहाबाद  
दूरभाष-0532-2440796, फ़ैक्स-0532-2440797

### योजना आयोग द्वारा वित्त पोषित परियोजना प्रश्नोत्तरी – विन्ध्य खनन क्षेत्र में रहने वाले स्थानीय लोगों पर खनन तथा खनन नियमन के सामाजिक आर्थिक प्रभाव का अध्ययन

#### व्यक्तिगत सूचना

- 1-नाम .....
- 2-पिता/पति का नाम.....
- 3-उम्र .....
- 4-पुरुष/स्त्री .....
- 5-पता  
गोंव/मोहल्ला .....
- ब्लाक.....
- तहसील.....
- जिला .....
- 6-शैक्षिक स्तर  
(क) प्राथमिक..... (ख) माध्यमिक.....  
(ग) स्नातक या परास्नातक..... (घ) अशिक्षित.....
- 7-वार्षिक आय  
(क) ₹ 10,000 से कम (ख) ₹ 10,000 से ₹ 50,000 तक  
(ग) ₹ 50,000 से ₹ 1,00,000 तक (घ) ₹ 1,00,000 से अधिक
- 8-वैवाहिक स्थिति  
(क) विवाहित (ख) अविवाहित
- 9- (i) पारिवारिक संरचना  
(क) एकल परिवार (ख) संयुक्त परिवार  
(ii) परिवार में सदस्यों की संख्या.....
- 10-धर्म  
(क) हिन्दू (ख) मुस्लिम (ग) अन्य
- 11-जाति  
(क) अनुसूचित जाति/जनजाति (ख) पिछड़ी (ग) अन्य
- 12-पशुओं की संख्या  
(क) गाय/भैंस..... (ख) भेड़/बकरी..... (ग) बैल..... (घ) अन्य.....
- 13-व्यवसाय  
(क) खेती (ख) व्यापार (ग) मजदूरी  
(घ) नौकरी (च) गृहणी (छ) विद्यार्थी  
(ज) अन्य
- 14-(i) व्यक्तिगत भूमि क्षेत्रफल(एकड़ में).....  
(ii) भूमि उपयोग के प्रकार (प्रतिशत में)  
(क) खेती ..... (ख) कृषिवानिकी ..... (ग) फलोद्यान .....  
(घ) अनुपजाऊ भूमि ..... (च) अन्य .....

## विषय-प्रश्न

- 1-(i) क्या आपके क्षेत्र में वन है?  
(अ) हां (ब) नहीं  
यदि हां तो कितने प्रतिशत?  
(क) 25% तक (ख) 50% से 75% तक (ग) 75% से अधिक
- (ii) क्या आप वनविभाग के बारे में जानते हैं?  
(अ) हां (ब) नहीं
- 2-क्या आपके क्षेत्र में खनन हो रहा है?  
(अ) हां (ब) नहीं  
(अ) यदि हां तो खनन प्रक्रिया किस प्रकार की है?  
(i) सतही खनन (ii) भूमिगत खनन (iii) जलोढ़ खनन (iv) कोई अन्य(यदि हो तो)  
(ब) यदि हां तो किस प्रकार के खनिज उत्पादों का खनन होता है?  
(i) पत्थर (ii) बालू (iii) सिलिका (iv) कोयला (v) कोई अन्य(यदि हो तो)
- 3-खनन क्रिया के कारण वन क्षेत्र पर क्या प्रभाव पड़ा है?  
(क) वन क्षेत्र में कमी आई है  
(ख) वन क्षेत्र में वृद्धि हुई है  
(ग) वन क्षेत्र पर कोई प्रभाव नहीं पड़ा है
- 4-क्या आप खनन सम्बन्धित नियमों से परिचित हैं?  
(अ) हां (ब) नहीं  
यदि हां तो, आप वर्तमान खनन कानूनों में क्या परिवर्तन चाहते हैं?  
(क) खनन उपरान्त चारागाह के विकास हेतु आसानी से क्षेत्र को उपलब्ध कराना  
(ख) आम जनता द्वारा पौध रोपण के लिए आसानी से वन विभाग द्वारा अनुमति प्राप्त होना  
(ग) खनन उपरान्त क्षेत्र में औषधीय पौधों की कृषि के लिए सरकार द्वारा अनुमति तथा अनुदान  
(घ) अन्य
- 5-खनन कार्यों से किस प्रकार का सामाजिक, आर्थिक विवाद है?  
(क) खनन क्षेत्र पर स्वामित्व को लेकर  
(ख) मजदूरों का आर्थिक शोषण  
(ग) महिला मजदूरों का शारीरिक शोषण  
(घ) बाल मजदूरी
- 6-क्या आपके क्षेत्र में गैर कानूनी खनन कार्य हो रहा है,  
(अ) हां (ब) नहीं  
यदि हां तो उसका क्या कारण है?  
(क) प्रशासन की निष्क्रियता के कारण हो रहा है  
(ख) राजनैतिक दबाव में हो रहा है  
(ग) भ्रष्टाचार के कारण हो रहा है  
(घ) कोई और कारण (यदि हो तो)
- 7-क्या आपकी आजीविका खनन कार्य पर निर्भर करती है?  
(अ) हां (ब) नहीं  
यदि हां तो किस प्रकार से?  
(क) मजदूर  
(ख) खनन स्वामित्व  
(ग) खनन सम्बन्धी कार्य जैसे-परिवहन  
(घ) कोई अन्य (यदि हो तो)  
यदि (क) हो तो खनन कार्य की वर्तमान मजदूरी दर प्रति मानक दिवस दर क्या है? .....  
तथा औसत मजदूरी मानक दिवस प्रति माह क्या है? .....

- 8-खनन क्रियाओं में महिलाओं, पुरुषों तथा बच्चों की रोजगार सम्बन्धी स्थिति क्या है?  
 (क) मजदूर- पुरुष ..... महिला..... बच्चे.....  
 (ख) खनन सम्बन्धी क्रिया जैसे-परिवहन, पुरुष ..... महिला..... बच्चे.....  
 (ग) खनन स्वामी- पुरुष ..... महिला..... बच्चे.....  
 (घ) कोई अन्य (यदि हो तो)
- 9-क्या खनन क्रियाओं में कार्यरत महिलाओं हेतु किसी प्रकार की सुरक्षा व्यवस्था की गयी है?  
 (क) सुरक्षा सम्बन्धी नियम (ख) प्रशिक्षित करना (ग) आत्मनिर्भरता (घ) अन्य
- 10-क्या खनन क्रियाओं से किसी प्रकार की स्वास्थ्य समस्याएं उत्पन्न हो रहीं हैं?  
 (क) श्वसन सम्बन्धित समस्याएं (ख) सुनने सम्बन्धित समस्याएं (ग) कोई अन्य (यदि हो तो)
- 11-यदि आपके क्षेत्र में हो रहे खनन कार्य बन्द कर दिये जाए तो क्या आपके आजीविका पर कोई प्रभाव पड़ेगा?  
 (क) हां (ख) नहीं  
 यदि हां तो कितना  
 (अ) 50% से कम (ब) 50% -75% तक (स) पूर्ण रूप से
- 12-खनन क्रिया के समाप्त होने के उपरान्त सम्बन्धित खनन क्षेत्र का उपयोग आप किस प्रकार करना चाहेंगे?  
 (क) चारागाह के रूप में  
 (ख) संरक्षित भूमि के रूप में  
 (ग) बांस उगाने हेतु  
 (घ) जैव ईंधन और औषधीय पौधे उगाने हेतु  
 (च) किसी अन्य प्रकार के पौधे जिन्हे आप उचित समझते हों
- 13-खनन के उपरान्त क्षेत्र का प्रबन्धन किस प्रकार करना चाहेंगे?  
 (क) पंचायत समिति (ख) स्थानीय समिति (ग) व्यक्तिगत (घ) अन्य
- 14-क्या खनन कार्यों से कृषि अथवा कृषि-उत्पादों पर कोई प्रभाव पड़ता है?  
 (क) हां (ख) नहीं  
 यदि हां तो  
 (क) उत्पादन घट रहा है  
 (ख) उत्पादन बढ़ रहा है
- 15-यदि (क) है तो कारण स्पष्ट करें?  
 (अ) वायुवीय अवयव (ब) जलीय अवयव (स) मृदा की उर्वरा शक्ति (द) अन्य
- 16-क्या कृषि वानिकी से आप परिचित हैं?  
 (क) हां (ख) नहीं
- 17-यदि हां तो, कृषि वानिकी हेतु आप किस प्रकार के पौधे चाहते हैं?  
 (क) फलदार (ख) औषधीय (ग) इमारती (घ) अन्य
- 18-(i) क्या आप पेड़ों के कटान संबन्धित नियमों के प्रति जागरूक हैं?  
 (अ) हां (ब) नहीं (स) आंशिक रूप से  
 (ii) क्या आपको निजी पेड़ काटने में कोई असुविधा हुई है?  
 (अ) हां (ब) नहीं (स) कह नहीं सकते  
 (iii) यदि हां तो किस प्रकार की-  
 (अ) स्थानीय पुलिस द्वारा प्रताड़ना (ब) वन विभाग का लापरवाह रवैया  
 (स) पेड़ों के कटान संबन्धित नियम के ज्ञान का आभाव (द) सभी (य) अन्य

19-आपके परिवार में ईंधन का मुख्य स्रोत क्या है?

- (अ) जलावनी लकड़ी (ब) गोबर के उपले (स) मिट्टी का तेल (द) कृषि द्वारा उत्पादित अपशिष्ट पदार्थ  
(य) बिजली (ल) एलपीजी गैस (व) अन्य

20-जानवरों के भोजन का स्रोत क्या है?

- (अ) भूसा (ब) पेड़ों की पत्तियाँ (स) घास (द) हरा चारा (इ) अन्य (स्पष्ट करें)

21-खनन क्षेत्र के पुर्नस्थापन से सम्बन्धित निम्न वक्तव्यों पर टिप्पणी कीजिए-

क्रमसंख्या	वक्तव्य	पूर्णतः सहमत	सहमत	असहमत	पूर्णतः असहमत
i-	पुर्नस्थापन कार्यक्रम को अन्य कार्यक्रमों के आधार पर स्थानीय स्तर पर बढ़ावा देना				
ii-	स्थानीय समितियों को सरकार द्वारा संचालित पुर्नस्थापन कार्यक्रमों में सम्मिलित करना	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii-	खनन करने वाले ठेकेदारों को उस क्षेत्र का पुर्नस्थापन के लिए कहना न करने पर उनके विरुद्ध सजा व आर्थिक दण्ड का प्रावधान करना	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv-	सरकारी गैरसरकारी संगठन तथा व्यक्तिगत क्षेत्र के लोगो द्वारा पुर्नस्थापन कार्यक्रम को बढ़ावा देना।	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v-	अन्य कोई टिप्पणी	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23-अन्य सुझाव/टिप्पणी

- i. ....  
ii. ....  
iii. ....  
iv. ....  
v. ....

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