Research Study

on

Coal Mining, Displacement and Rural Livelihoods: A Study in Mahanadi Coalfield Odisha

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INTRODUCTION

Despite government's repeated assertions for the sustainable mining extraction and development of rural and tribal communities living near the vicinity of mining areas, these have not been converted into implementable solutions. The top-down approach proved disastrous in managing the natural resources, causing harm to the ecosystem and thus threatening the lives of the poor people dependent on the ecosystem. Because of the current onslaught of globalization and industrialization the power of money and market has begun to distort democracy and the natural resources from rural and tribal areas are being exploited to meet the ever increasing requirements and aspirations of the affluent groups.

With the above background, the present study primarily focuses on the various implications that coal mining has on social structure and culture of the mining affected areas. The impact that coal mining has on health with a special reference to women and child and on local biodiversity, agricultural productivity, employment and livelihood is chalked out in details. The study also explores various roles of Corporate Social Responsibility of Mahanadi Coalfields Limited (MCL) in helping rehabilitation of displaced people and restoration of ecological resilience and the various roles of Gram Sabha/ Gram Panchayat/Non- Government Organizations/Forest and Tribal Affairs Department on mitigation of and adaption of livelihood. In addition the study has also accessed the status of ecological restoration of evident mining areas and role of mining companies in its complete restoration and more specifically the role of both mining companies and forest department in use of Compensatory Afforestation Management and Planning Authority (CAMPA) fund for ecological restoration.

METHODOLOGY

For achieving the major objectives of the study, the villages affected by the activities of mining and are covered. Six villages according to the classified distances from the mine are purposely selected. The strata of distances for villages were 3, 6 and 9 kilometers from the vicinity of the

mines and two villages from each stratum were selected. In addition to this, two more villages as control villages which are not affected by mining and which belong to the same district were selected for comparison. A total of 75 Households based on ethnic composition and size of land holding were selected for enumeration from each of the villages. Thus a total of 600 such households were the sample for the study. Both qualitative as well as quantitative data were collected using household schedules, different set of questionnaires for various stakeholders, interviews, and case-study, Right to Information (RTI) and observation methods. The data collected were analyzed using Statistical Package for Social Sciences and content analysis. The utilization of Compensatory Afforestation Management and Planning Authority funds released for afforestation were explored by visiting relevant government departments and through the use of Right to Information, Act 2005. In support of the study, Focused Group Discussions were organized with public and other stakeholders. Corporate Social Responsibility activities of Mahanadi Coalfields Limited were assessed from the company as well as the villagers.

FINDINGS

SOCIAL STRUCTURE

Coal mining has negatively affected the unity, cohesion of the rural people. Mining related displacement has caused more than 70% of the family's transition in their family structure i.e. from Joint family to Nuclear family. No doubt the economic gain of the people in these villages have soared but the hard hitting fact is that the economic gains have brought unprecedented loss in the context of social structure, social capital , family , kinship and caste structure. Rise in income and wealth has given rise to intra household conflicts in mining affected villages where the family relation, social structure have faced tremendous loss. In few cases it was observed that the old parents were neglected by their children who got job on compensatory ground. Though it is written in MCL's offer order that if somebody neglect his/her parents he/she will be terminated from job, but due to lack of voice few old parents failed to draw the attention of MCL authorities. Loss of agriculture and forest based resources has brought a loss to social relation and traditional rituals and customs. The rise of industrialization and urbanizations which enters into this area along with mining intervention has widened the scope for cultural diffusion. With

the passage of time the urban culture has taken a dominating space then the traditional culture here.

Where as in the control villages the social relation, celebration of village festivals, village unity are in the position of status quo and have not undergone deviation in any way. It was also found out that a mere portion of around 16.22% of the sample population celebrated the agro based and other village level festivals which the villagers used to celebrate before the advent of mining whereas around 83.77% of the sample population of the villagers stated that they do not celebrate the festivals in the present context due to lack of unity and integrity.

With the advent of mining the traditional Jajmani relation has received a big blow and it has taken a new shape with no concept of land, grains, agriculture but only cash. The introduction of monetary economy has brought about profound changes in the practices of Jajmani relation in the affected villages. In mining affected villages no more land was found as center of power. The loss of land due to mining has given a space in rise of new class that is contractor. The contractors are having proximity with MCL authorities and it was observed that a large number of landless villagers as well as few elite groups of villagers were seen running behind the contractors for getting non- agricultural occupation.

However, the recent initiation taken by MCL in formation of cooperative society of project affected peoples (PAPs) have given a new hope of life to the project affected peoples. As of now 50 PAPs are formed taking 20 project affected households as one PAPs. Under this scheme around 6000 people have received jobs. Without tender these groups are given OB removal, coal loading and transportation jobs on priority basis.

Though the MCL has tried a lot to protect the cultural history and tradition of affected villagers, it has not succeeded in all cases due to certain technical problems like getting a government land in nearby non coal bearing areas to rehabilitate all the villagers became very difficult.

ENVIRONMENT AND HEALTH

The different activities relating to mining have directly or indirectly contributed to air pollution. The associated activities with the open cast mines such loading and unloading of coal,

transportation of coal, poor condition of roads and huge quantities of open air coal burning by the villagers are the causes responsible for air pollution. As there is limited control over coal theft all most all the villagers and local shopkeepers and eateries are burning coal for cooking purpose which contributes to air pollution. During winter season it used to create a pathetic condition as the entire area became smoke in morning. Though MCL reimburse one cylinder per month to each non-executive employees but still most of the people have not left their tendency of using coal while cooking.

The policy guidelines of MCL highly discourage the movement of uncovered coal loaded vehicles but it was observed that most of the coal loaded tippers were moving without proper cover within the mine boundary. Lack of proper monitoring mechanisms might be the reason for the above said cases. MCL authorities claimed that as huge coals are transported every day, it is difficult to cover all the tippers within mining boundaries. They said that they are trying to assure 100% truck covering while it moves out of their boundary. As a part of monitoring mechanism they have started installing web cam in all these places. However, both the State and MCL should take it as a joint responsibility and monitor the truck covering.

Not only large amount of coals are destroyed as a result of uncovering of the loads but also the fallen coal acts as a pollutant which degrades the roads and mixes with the air particles. Though there was an agreement that a separate coal corridor road will be built, it is not yet ready due to lack of administrative support. Spillage from the tippers due to overloading and poor body condition of coal transport vehicles generates large amount of dust particles. The authorities have not taken sufficient measures for the collection of spilled over coal materials which has become a source of pollution. Dust generated is directly proportionated to the length of the coal transportation road and its condition. Coal transportation roads in this region are found black topped. They were constructed quite earlier when the coal production and transportation volume was 1/2 of the present level. Thereafter regular repairing work is not done.

During field work it was observed that as coal dispatch facilities are not properly developed the stocked coal lead to combo stone, fire and smoke. Whatever coal produced it should be disbursed. It should not be stored. The coal should not take to stocks. However, the recent

demand for coal of MCL has solved this problem. Around 85% produced coals are immediately dispatched.

Though MCL has adopted some measures like using blast-less mining technology which eliminates the dust generating operations like drilling, blasting and crushing and mist type water spraying system along the conveyor belts/bunkers in the major coal handling plants but the blast less technology is not used in all the places. However, the officials assured that the conventional technology will be stopped everywhere within a very short period. Another mitigation measure as claimed by the MCL includes mist type water spraying system along the conveyor belts/bunkers in the major coal handling plants but the sufficient number of mist type water system was not found during the field study. It should be a compulsion that both the road sides should have sufficient number of water sprinklers which is not seen in Talcher coal field. Occasionally some tanks were moving on road to sprinkle water. However, to deal with this problem MCL has taken an initiation to porches 10 number of Mist blower cum road fogger machines to control dust.

Though MCL has taken serious step in installing and strengthening of existing dust collectors (using mechanical road sweeper), it is not successes in introducing this in all the cases. Still in most of the cases manual sweeping are carried out after the coal transportation.
The data collected from Odisha Pollution Control Board shows that the SPM concentration is alarmingly high in few sampling locations, whereas RSPM concentration which once used to be within acceptable limits is now gradually approaching its standard acceptable value of 300 $\mu g/m^3$. In some cases it was observed to have crossed the standard limits. The values of RSPM and SPM recorded shows a fluctuating trend from 2012-2014 and then with a steep rise in the values of RSPM and SPM respectively in March 2014. Responding to the researcher's query MCL authorities replied that the rise of SPM is confined to the core zone not the buffer zone.

While around 95 percent villagers in mining affected villages claim that intervention of mining has changed their earlier healthy environment, it is not so in the case of control villages. While all most all the villagers are in favour of mining as it benefited their economic condition they show their un-satisfaction towards the air pollution in their locality. After taking views from the all the stakeholders, it is believed that MCL has taken measures for the abatement of pollution

but lack of coordination, dialogues between the villagers and MCL might be the reason for increase in animosity of the villagers towards MCL which has resulted in such a negative response. This can be neutralized if a proper co-ordination will be developed among MCL officials and villagers and their grievances addressed in a proper way. Through rise of frequent interface between villagers and officials it can be reduced.

The extraction of mining has influenced the water table. Especially in summer season the villagers are facing lots of problem in getting water for domestic consumption. Water bodies have been clearly dominated by the coal associated waste materials which have resulted in water scarcity. No doubt the water supplied by MCL to some extent fulfil the drinking water needs of human but the concern will rise for animals and birds that depend on surface water for their survival. As part of conservation of water resources, MCL is mostly depending on surface water rather than ground water. However, in the case of control village there is no such water scarcity. As part of measuring the water table, MCL has installed 23 Piezo meters to monitor the water table.

The data collected from SPBC, Bhubaneswar shows that suspended sediments and COD in most of the mining areas and BOD in few cases have crossed the specified standard. Aquatic life will be disturbed due to reduction in photosynthesis, high suspended sediments, COD and BOD. Drainage of mine water to various stream and rivers have affected the aquatic life. However, the recent initiative called 'Zero Discharge' undertaken by MCL is a major step towards combating the water pollution. It will solve all most all the water pollution problems in course of time.

Though MCL has taken lots of initiation to biologically reclaim the mined areas, but it is not reached with a proper solution due to certain technical problems. Firstly while extracting coal there is certain short fall of soil quantity and proper reclamation of dump area not being practiced. In the abandoned mines the top soil is not being whether progressively or concurrently utilised for its reclamation which is making the environment degradable as it has become a dumping ground. As per the rules of mining closure act for successful biological reclamation of the abandoned mines the area should be planted with nitrogen fixing tree species or fruit bearing tree species and endemic and mixed culture. No doubt MCL has planted many plants as per the

mining closer policies, but due to lack of monitoring mechanisms some of the plants are dead and also the villagers are not much aware about it.

It is mentioned in mining closer policy that unless and until a mining company has ecologically reclaimed the abandoned mining, no further extraction will be allowed. Even it is mentioned that both the extraction and back filling of extracted areas will move simultaneously. However, till now any back filling activities are not done for Bharatpur South Quarry abandon mining areas.

The data collected from MCL reflect that MCL has taken some serious steps in reclaiming the de-coaled lands. While the major portion of the lands (64.36%) are technically reclaimed, only 37% of area to be backfilled is technically and biologically reclaimed. Lack of sufficient land has created a problem for MCL to store the OB Dump and top soil. The practical problem faced by the MCL is that while excavating the coal there is certain shortfall of soil quantity held, which make it difficult to arrange soil for backfilling. Though MCL has shown its seriousness in planting trees in OB dump areas, the density of plantation is less and the quantity of fruit bearing plants are also less in number.

The destruction of ecosystem in post mining period has brought a great loss to the wildlife and their habitat. The fragmentation of habitats due to mining activities has made difficult for some animals for their ecological move. Understanding the problem of ecosystem destruction MCL has set up a eco restoration site in Balanda covering around 200 hectares of land. It has practiced there tree plantation for ecological restoration of degraded lands.

The overall observation during fieldwork reflects that the sound pollution is mostly due to transportation of heavy vehicles. Though 81% households claim that some crack has appeared in their houses, but not all the cracks are the recent one. MCL has taken lots of step to control sound pollution by using blast less technology, fixing of time of blasting, giving prior information of blasting to villagers, blasting time is very much limited and its effect is minimised by use of electronic delay detonators. It was noticed that the company is providing sufficient hearing protection materials (ear plugs and ear muffs) to operators and workers to reduce health hazards from noise.

Villager's health condition has deteriorated due to direct inhaling of air pollutants which has asthma attacks, respiratory infections, or changes in lung function. The cases of suffering from asthma and respiratory toxicities have increased. Around 93.77% households contended that they have suffered from some serious diseases in last 3 years. More than 51% of the household claimed that frequency of women and children getting stuck with various diseases have increased enormously than the pre-mining phase. According to the villagers the frequency of diseases also increased in manifold periods. MCL has organized lots of events to create awareness among villagers, but it has not succeeded in educating the mass regarding the harsh impacts of air borne diseases. The frequencies of health checkup camp can be increased. Though MCL is providing free medical facilities, these are restricted to their employees and their family members and contractual workers only. In this situation poor unemployed households are the worst sufferers. They have neither a job nor having free medical facilities. This data collected from field visualizes that due to mining the direct cost of medical expenditure has increased as compared to pre mining and control villages. Population of Livestock has decreased to a significant level. The green lush environment has now changed into barren lands and therefore livestock's food intake has declined because of which diseased incidence of livestock has grown.

CORPORATE SOCIAL RESPONSIBILITY (CSR)

MCL officials gave their view points on CSR. According to the policies of MCL CSR aims at framing welfare measures for the community at large, contribution to the society at large by way of social and cultural development, imparting education, training and social awareness especially with regard to the economically backward class.

The CSR activities of MCL included water supply, education, infrastructure, electricity, health, environment, sports and culture, social empowerment and other miscellaneous. MCL annual expenditures on CSR increased cumulatively till the year 2010-11. But for the year 2011-12, the expenditure decreased and again increased in the year 2013 amounting to Rs 1724 lakh. In the year 2012-13, there was a sudden increase in CSR; most of the funds were spent for execution of piped water supply, provision of drinking water through mobile tanker, construction of additional classrooms and boundary walls at schools and colleges. The overall CSR expenditure in last five years shows that environment sector which is highly affected due to mining activities is highly

ignored. MCL officials feel that as it submits fund under CAMPA to Government of India, it is the duty of forest department to take care environmental aspects. As a part of health care, MCL has initiated a project of around 290 crores to set up a medical college at Talcher. The skill up gradation training programs of MCL is not so effective. In the field, it was found that in most of the villages, the new comers were not given adequate skill up gradation and training programs. As a recent initiative of skill upgradation it has made collaboration with 3/4 ITIs. It was also observed that only in those villages where the public representatives were dynamic and had a kind of political matureness and lobby were successful in bringing projects under CSR. More than 90% of villagers also reported that there are no CSR programs being carried out by the MCL for the welfare of livestock. Due to lack of administrative support from State Government most of the project got delayed. Even the local level party politics have stood as a major constrain in implantation of the CSR projects.

ROLE OF INSTITUTIONS

The functioning of different institutions such as NGOs, Gram Sabha, Gram Panchayat, and Forest Department is far from the satisfactory level. In all of the six mining affected not a single NGO was found working for the community. Villagers too did not know about NGOs and their functioning. More than 95% of the villagers claimed that there is not even a single NGO working in the villages for the betterment of the people. There are number of issues related to people in the villages ranging from issues related to health, environment, wages, safety, pure water, electricity and displacement. The number of conflicts among the government, villagers and MCL is increasing in frequency and NGOs can play a big role ranging from advocating for the poor to implementers of government programs; from agitators and critics to partners and advisors; from sponsors of pilot projects to mediators. Due to lethargic approach of Gram panchayats, the number of government welfare schemes and measures such as BPL card, Indira Awas, Job card are not distributed in the villages in proportion.

Gram Sabha is losing its relevance in the affected villages. Villagers asserted that the Sarpanch or the elected heads have developed a nexus with MCL, so that they would not go against MCL. Villagers also alleged that the Sarpanch of various villages made secret deals with the MCL and

the close associates of the Sarpanch were employed by MCL as contractors in the companies. In most of the villages the Gram Panchayat failed to take the issues to the upper level.

The forest officials working in Angul division are more vibrant in spending CAMPA funds and organising different activities like plantation. Though officials have done lots of plantation activities under CAMPA fund, they failed in taking the people into confidence. Even whatever plantation details under CAMPA was found shows that it did not cover the affected areas. They have planted some trees as per the convenient of the forest department. As per overarching objectives and core principles of the State CAMPA guidelines, the State CAMPA was also to promote a voluntary movement of youth and students for supporting on going conservation activities and new activities initiated in the State Forest Department. But the fact remains that no such activities have been undertaken by forest department in the district level. Though field level staffs have been recruited contractual basis to meet shortage of personnel but they are working in the range office.

The tribal department was also seen inactive in the study areas. The district pollution control board is not playing any role. They have never interacted with vilalgers and the people of mining villages are unaware of what a pollution control board is. Only in few villages some machines are set up to calculate the air pollution, but in reality no body aware about the reliability of those machines.

LIVELIHOOD

A significant change was observed as the earlier producer has turned into consumers depending solely on market. Displacement has compelled villagers to accept the transition. It was hard to find people with cultivation; the reason being people don't have land for cultivation after displacement. A rare number of people have land but most of them don't dare to cultivate because of labor crisis, loss of fertility of land due to pollution and water scarcity. Mining has broadened the path for employment and high standard of living, but it is very disturbing to look into the health aspects of the mining affected communities. Mining has a sheer negative impact on human capital. During pre-mining period the major source of income was agriculture and forest resources, the source of incomes became mining centric after the post mining period. With the starting of MCL economic activities in the area have also increased. Labourers are able to get

different work opportunities. Percentage of households depending on trade and commerce is more in mining villages than in the control villages. High monthly income ensures them higher purchasing power and hence is able to invest in business.

In the context of providing employment opportunities, MCL has done excellent job in providing employment to as much as affected people.However, the overall situation shows that irrespective of caste and communities all are financially benefited after the introduction of coal mining in this region. The scenario from mining affected villages shows that while around 89% households were having income less than rupees fifty thousand per annum during pre-mining period, it is only 8.7% now. As the displacement site used to be allocated by the State Government to the MCL, it is becoming very difficult in the part of MCL to get a land as per the wish of villagers. For which the entire process of rehabilitation got disturbed. The confrontation between development and the people who are fighting to preserve their culture, livelihoods and identities have stood as major threat in the process of development.

Most of the displaced communities found it very difficult to procure an appropriate land and build a house by investing the monetary compensation. Though MCL is providing higher compensation in comparison to Odisha State Government, it is not sufficient to afford a house as the market price has gone up. Prior to mining the women folk used to collect minor forest products such as firewood, cereals, animal products, fibres, edible products and kendu leaves. But with the establishment of mining industry, women populations are actively participating in the mining related activities working 7-8 hours and are earning 120 rupees per day. The livelihood of the women communities of control villages is still protected. They used to participate in the agricultural activities of their village and are generating some income from forest products. It was also observed that every household used to purchase 2 packets of coal in a week which costs 50 rupees for cooking purpose. Except some economically well-off households all most all the households are completely reliant on coal for preparation of food. The intervention of mining has posed a serious question on sustainable livelihoods. People now depend on mining and allied areas for their survival but issue at hand is what will happen once the mining activities are over in these areas? Do the villagers will get back their traditional source of income? Can MCL will give back those lands to the villagers making it agriculturally

fit. Sustainable mining should balance economic growth and protection of the environment by taking into account all benefits and costs. In case of India closing the mines is not an immediate option. We need mining activities to be faster to make India a developed nation. But it is needed to bring a balance between economic gain and environmental loss to ensure greater sustainability of the local communities. Keeping in view the need for combating global warming and climate change the country should try for different policy options for an environmentally clean and energy secure future.

RECOMMENDATION

After the inception of mining the economic wellbeing of the people has increased tremendously than the control villagers but there are host of negative impacts that coal mining is posing in a cumulative fashion and the people are directly and indirectly affected by it. At this juncture, improvement in the overall condition of the environment and the quality of life should be the prime responsibility of the mining company apart from the administration. Certain recommendations on the basis of research findings are:

(a) Both the land acquisition and land possession activities should carry out simultaneously and all disputes should be resolved as soon as possible in consultation with public. Giving much time gape between land acquisition and land possession giving an opportunity to the villagers to go for agitation in future.

(b) Rehabilitation and Compensation issues should be dealt with equitably. The company should provide all infrastructure facilities to the rehabilitation colony. They should take into consideration the plight of landless households. They should give much emphasis on rehabilitation rather resettlement.

(c) Issues of post-mine closure like unemployment, income potential, migration, environmental clean-up should be discussed and taken care much in advance.

(d) Higher administration should look into the effective utilization of CAMPA fund in the affected villages.

(e) A proper monitoring mechanism should be developed by the MCL to monitor the negative impact of mining activities and proper implementation of its policy guidelines including CSR, mining closer, R&R, environmental protection, etc.

(f) To create a healthy environment for industrial promotion regular interface among villagers and industry should be organised.

(g) To strictly implement the mining closer plan, the Government should act more vibrantly and try to resolve all the technical issues if companies are facing to close the mining.

(h) Government departments working in grass root levels should monitor the CSR activities of the companies and should give suitable advices to them wherever required.

(i) Pollution control board should more vigilant and should take the public opinion regularly in the context of pollution.

(j) Providing mobile dispensary to surrounding villages on a regular basis; appointment of village health workers in surrounding villages; project to tackle the issue of fluoride problem; Periodic specialist camps, e.g. Eye, ENT etc; and other sanitation programs should be taken care.

(k) Different mines are given the EC for the certain land areas. However, the owner is same MCL. If cluster wise EC will be given they can maintain EMP.

(l) State Government should assure local administrative support to MCL for quick implementation of CSR activities. Government should organise all stakeholders meeting continuously to need the demands of people.

(m) Provisions should be made for a buffer zone between the local habitation and the mine lease in the form of a green belt of suitable depth. Restricted entry, use of sirens and cordoning of the blasting area are some of the good practices to avoid accidents.

(n) An initiation should be taken from both State Government and MCL side to neutralise the local conflict and formed various local level committee to select the demand of the villagers.

(o) Possibility may be find out for mechanical covering of coal loaded tippers.

(p) NGOs should be promoted for working in this region in accordance with MCL.

1. INTRODUCTION AND LITERATURE REVIEW

Coal provides over 25 percent global primary energy need and 40 percent of the world's electricity consumption. It drives much of the global economic development. It is the main fuel for electricity generation in most of the countries in world. It is an essential element in over 65 percent of the world's steel production (World Coal Institute, 2006). It is the most abundant fuel resource in India. It is the prime source of energy and perhaps the largest contributor to the industrial growth of the country. Over the years, coal has become a major source of revenue in central India. Most of the rural consumers depend on coal for their energy needs. For consumers, coal offers excellent value, as it is cheaper per energy unit in comparison with other fuels.

The current per capita commercial primary energy consumption in India is about 350 kg/ year[1]. Considering the limited reserve potentiality of petroleum and natural gas, eco- conservation restriction on hydro electrical project and geo- political perception of nuclear power, coal will continue to occupy centre- stage of India's energy scenario. No doubt coal plays a fundamental role in global development, but it must meet a number of social and environmental challenges to demonstrate its role in sustainable development. Like any other source of energy, coal has also a number of negative impacts. Coal mining, despite the very substantial benefits they bestow on society, stir strong emotions. A great ongoing social challenge for the coal mining industry is sustainable development and community acceptance of its role in society. The problem of mining-induced displacement and resettlement (MIDR) poses major risks to societal sustainability. MIDR is accompanied by the resettlement effect, defined as the loss of physical and non-physical assets, including homes, communities, productive land, income-earning assets and sources, subsistence, resources, cultural sites, social structures, networks and ties, cultural identity and mutual help mechanisms. The mining industry has not only displaced the owners of the land but polluted the local water resources breeching the state regulations of human rights to water. The health hazards and degeneration of the health conditions of women and children is one of the most serious impacts of coal mining. Here, women's health has to be understood from a larger perspective of direct and indirect impacts - the exposure of women and children to mine

1. http://www.coal.nic.in

disasters and mine pollution as well as to the reduction in quality of life due to denial of access to food security, natural resources and livelihoods.

Any form of coal mining, surface or underground causes a wide range of social and environmental problems such as break down of social structure, health degradation, air, water and noise pollution, decline in agricultural production, deforestation, disturbing the traditional form of livelihood, displacement and other socio-economic impacts. Opencast coal mines damage a large land surface area, displace people from their ancestral homesteads and cause agricultural losses. This raises a number of environmental challenges, including soil erosion, dust, noise and water pollution and impacts on local biodiversity. Mine subsidence can be a problem with underground coal mining, whereby the ground level lowers as a result of coal having been mined beneath.

With coal mining the country is becoming resource rich and the government is earning good revenue. But the negative impacts in the form of water, air and noise pollution, disturbance of social structure, indigenous culture and social network, dismantles patterns of social organisation and inter-personal ties, degradation in health and loss in agricultural production and displacement affects the communities are not taken into account. If we will not focus on these sociological and economic aspects of coal mining, it will be difficult not only to extract coal for our sustainable future energy requirement but will create a wide range of social movement putting the rural and tribal livelihoods in the risk. So, it is need of the hour to assess the socio-economic and ecological impact of coal mining on rural livelihoods. In the absence of such assessment the present benefits could be at the cost of other resources/ communities or future generations.

LITERATURE REVIEW

The Mining Mineral and Sustainable Development (MMSD 2002) report by International Institute for Environment and Development (IIED) and World Business Council for Sustainable Development reveals that the policy makers, business leaders, public interest campaigners, people working in mines, local communities and consumers must join the discussion and take action if the world is to find a better way to meet society's needs. It is a helpful step towards sustainable development. Criticising the current mining policy in the state of Jharkhand,

Kanaujia in his study said that the lack of coordination among various stakeholders in mining operation is standing a bottle neck in development (Kanaujia et al, 2010). He claimed that a proper strategy should be made to maintain coordination among the State, the mining companies and the indigenous tribes relate to the particular natural resource base. The access to natural resources and the burden of ecological degradation are unequally distributed among human actors.

A study by the Sustainable Energy and Economy Network (SEEN 1996), Institute of Policy Studies, USA, shows that Orissa's industries and coal-fired power plants will be emitting the equivalent of 164 Mt of carbon dioxide annually by the year 2005, or the equivalent of about 3 percent of the projected growth in manmade greenhouse gases anticipated globally over the next decade. In addition, Orissa's industrialisation will release toxic and potent global warming agents, which contribute to a perpetual change in the earth's atmosphere. A recent study by Chaulya (2004) shows that in the Ib Valley coalfield area of Orissa the annual average Total Suspended Particulate (TSP) concentration exceeded the respective standards set in the National Ambient Air Quality Standard (NAAQS) protocol at most residential and industrial areas. Thus, environmental problems in case of Orissa are severe and coal is the most important contributor. In energy hungry world the challenge for coal industry is to further reduce the greenhouse gases and other emissions, while continuing to make a major contribution to economic, social development and energy security.

Any form of coal mining, surface or underground causes a wide range of social and environmental problems such as decline in agricultural production, displacement and other socio-economic impacts. Opencast coal mines damage a large land surface area, displace people from their ancestral homesteads and cause agricultural losses. This raises a number of environmental challenges, including soil erosion, dust, noise and water pollution and impacts on local biodiversity. Mine subsidence can be a problem with underground coal mining, whereby the ground level lowers as a result of coal having been mined beneath (Mishra, 2007).

The mining industry has polluted the local water resources breeching the state regulations of human rights to water. Polluted seas along coastal areas contaminate fish and shell which when ingested during human consumption further increase the risk of developing water contaminated diseases. The use of contaminated water for irrigation of crops increases the exposure to harmful

toxins increasing the impacts on individual and community health. With the establishment of MCL (Mahanadi Coalfields Limited) and NTPC (National Thermal Power Corporation), the social environment, natural vegetation and agricultural crops have been affected in Angul-Talcher belt of Orissa. Due to these there is a considerable fall in biomass production. The mines of MCL & NTPC draw about 25 crores litres of water per day from the river Brahmani and in return they release thousands of gallons of waste water to the river Nandira which contains substances like Ash, Oil, Heavy Metals, Grease, Fluorides, Phosphorous, Ammonia, Urea and Sulphuric Acid. Fluoride pollution is very severe in this belt because of reported incidence of white spots all over the body, incurable skin infections and lumps of dead skin are increasing. Forest is degrading day by day and seed germination has slowed down (Murty, Aruna & Patra, 2006). The major environmental challenges encountering the coal industry are impacts of mine fires, dust suppression and control particularly haul road dust consolidation, treatment of mine waters containing heavy metals/acid mine drainage, restoration of water table and quality of ground and surface water, augmentation of pumped out mine water for drinking purpose, reclamation of mined out areas with pre-determined land use patterns conducive to the local populations etc. (Mishra, 2007).

In East Parez of Jharkhand, women are fighting against destruction and pollution of their lands and resources. They give birth to physically and mentally challenged children due to the impact of radiation from uranium mines. In Rajasthan, rural and tribal women suffer due to inhuman working conditions, bonded labour and low wages in sandstone mines (The Hindu, April 26, 2003). Studies in Chhatisgarh and Orissa (MMP 2003) have shown that the number of unwed mothers have increased and so is the case of women trafficking, immoral activities, AIDS, domestic violence in addition to the emotional and economic trauma faced by women.

Even women and children who are not working in the mines are constantly exposed to various respiratory illnesses due to inhalation of dust particles and experience multifunction 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).

The impact of Mica mining on women in the Sydapuram Mandal of Gudur area in Andhra Pradesh is very pathetic. It has been observed that in this mine one third of the workers are widowed women as their husbands are succumbed to "silicosis-tuberculosis". At workplace women are given the crushing, sorting and dusty duties by working in the milling and processing units with limited protected clothing or equipment, exposing them to toxic, polluted air; creating complicated health implications including various lung diseases, cancers and the interference of toxins causing reproductive, menstrual, pre and post natal complications, anaemic conditions, gastrological illness and anorexic malnutrition. It has been also reported that mining has contaminated the bore and well water in this area which looks murky in colour but the people have no choice and are facing health problems due to this (Wright, 2004).

Pollution of the streams that originate in the mining area affects agriculture and the farmers. Paddy yield declines because of the accumulation of silt and waste tailings in the fields. In monsoon, water brings with it silt and tailings. This hardens in summer. Sometimes the tailings render the sand unfit even for construction purposes (Sharma 2001). On the other hand, reduction in agricultural productivity affects rural people since agriculture is their main source of livelihood. Blanketing of top soil in the agricultural land results poor yield. The coal belt of central India overlaps with forest and tribal and has caused negative impacts on both biodiversity and local communities. In the coal belt of Jharkhand, the large-scale mining activities have affected the traditional lives of the tribal in several ways. Their sacred groves, usually one in each village, have been destroyed in large numbers (Vagolikar, Moghe and Dutta 2003).

Rapid development of open cast coal mining in the North Karanpura Valley in Hazaribagh and Chatra Districts of Jharkhand is destroying the resources of food and water of the original inhabitants of these areas, mainly of Advasis (indigenous people), of more than 200 villages. The region has extremely fertile land which is now being converted into a mining site, taking away vital farming land and forests, and polluting the Damodar River, which is the lifeline of the area (Indigenous Portal, 2009).

Exploitation of mineral resources has resulted in large-scale displacement of the local population in India. According to the Land Acquisition Act 1894, the government is empowered to acquire any land for public purposes. Mining displaced 2.55 million people in India between 1950 and 1990 (Downing 2002). Three quarters of these are yet to be compensated. Mining in Orissa is not a simple 'dig and sell proposition' but a complex socio-economic and ecological challenge. The problem of mining-induced displacement and resettlement (MIDR) poses major risks to societal sustainability. Relocating a community is not, in itself, social or environmental impacts. It is a process that can cause social or environmental impacts such as anxiety and land degradation (Vanclay, 1999). The construction of Hirakud Dam uprooted a large number of tribal people in the 1950s and many of them were displaced for the second time when their compensated lands were found to be coal-rich. Many people do not have their written records of land ownership, so they are not being compensated properly. Orissa's share of coal mining related displacement accounts for more than half of the total displacements related to coal mining in India (SEEN 1996). High lighting the case of Vedanta Alumina and dangiria kandha at Niyam Giri hill, Sahu claimed that the corporate interests backed by State Governments are trampling on indigenous livelihoods and threatening ecological reach areas (2008). Mass scale violation has gained its space on the name of mining for development. The three communities in the East Godavari District of Andhra Pradesh i.e., The Nookadora Tribal Group, The Komati Non-Tribal Group and The Khond Primitive Tribal Groups have been threaten by mining for a number of years. The people here are facing the problems of depression, interpersonal relationships, land alienation etc. due to displacement (Goessling, 2010).

STATEMENT OF THE PROBLEM

The liberalisation process that started in India in the early 1990s has made Orissa potentially the most attractive destination for large capital-intensive projects by both Public and Private-sector firms – typically mineral-based ones. These projects are facing opposition from the people, especially by those who are likely to be displaced and those who will be indirectly affected. The lack of coordination among various stakeholders in the mining has made these issues unresolved. The corporate interests backed by State Governments are threatening the livelihoods of the poor and marginal communities.

Over the years, stakeholders in the industry have been striving to avoid and mitigate the potential adverse effects of mining on fragile ecosystems and local communities. Governments are increasingly formulating and adopting policies to ensure the sustainable development of their country's mining industry and mining companies are striving to be better environmental citizens. Many initiatives have been taken by the industry voluntarily as part of Corporate Social Responsibility (CSR). A number of mining companies have taken the responsibility by amalgamating environmental concerns and community development in their corporate policy. Environmentalists have become increasingly involved in mining disputes. However, a lot need to be done to ensure that mining is carried out in a more sustainable way. Apart from the above issues, there are certain very important issues that are required to be addressed in the context of coal mining impacts with a specific reference to a coal abundant but economically poor state like Orissa. For example, how does the coal mining influence the social structure and indigenous culture? How does mining influence the livelihoods of rural people? What impact does it have on the health of women and children? Does mining support/ provide sustainable livelihoods? And what exactly are the benefits / costs of the mining projects? How can benefits and indeed potential negative outcomes be assessed? With these questions in mind the present study concentrates on the socio-cultural, economic and ecological effects of coal mining in the Mahanadi coalfield of Talcher, Orissa. Five major impacts viz on social structure, culture, livelihoods, agriculture and health were analyzed.

OBJECTVES OF THE STUDY

More specifically, the major objectives of the current study are -

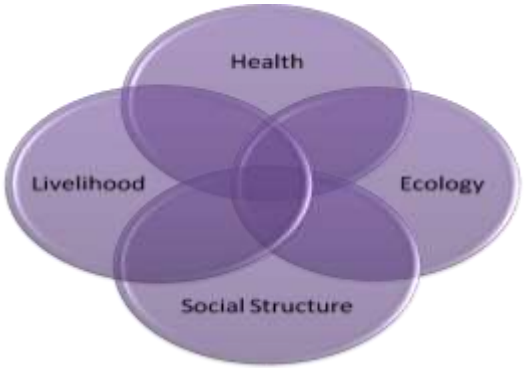
1. To identify the implication of coal mining on social structure and culture of the study areas.
2. To assess the impact of the coal mining on health with special reference to women and child.
3. To assess the impact of the coal mining on the local biodiversity, agricultural productivity, employment and livelihood.
4. To identify various role of CSR in helping rehabilitation of displaced people and restoration of ecological resilience.

5. To identify various Role of Gram Panchayat/Gram Sabha/NGOs/Forest and Tribal Affair Dept. on mitigation and adaptation.
6. To identify the status of ecological restoration of abandoned mined areas and role of mining company on restoration and more specifically the use of related CAMPA Funds for restoration.

CONCEPTUAL FRAMEWORK

A company produces coal, consumers use coal as energy or power and governments get revenue. But all indirect effects are borne by the people, who stay in the vicinity of the mines. They face numbers of problems. With the advance of coal mining, local communities used to leave their lands and move to other places, social network disturbs pollution of nearby area rises and it has a negative impact on health. Agricultural production decreases day by day. Forest areas decrease. However, in most of the time the socio-economic, cultural and environmental costs are ignored while discussing on mining. It is observed that the poor had more close livelihood and consumption linkages with environmental resources (Chopra, 2000). The activities of mining operation disturb the other natural resources base. Until we analyse the cost and benefits of coal mining from the context of socio-economic and environmental perspectives it will be difficult to assess it. In this study, three major impacts are proposed to be included. They have impact on social structure, health, ecology and livelihoods.

Figure 1: An Analytical Framework



Hypothesis to be tested

(a) Due to coal mining the local communities have been displaced from their own land and also lose their homes, agricultural land forest based livelihoods.
(b) Due to coal mining the local communities lose their social capital and the rural and political structure got disturbed.
(c) Introduction of mining has increased health problems.

METHODOLOGY

Universe of Study

The present study was carried out in Mahanadi Coalfield Limited (MCL) region of Odisha, India. Mahanadi Coalfield Limited (MCL), a subsidiary of Coal India Limited (CIL) is divided into three parts as per its functioning areas; such are Talcher, Ib Valley and Vasundhara. However, the present study is confined to the open cast mining areas of MCL Talcher.

Rationale Behind Selection of Study Area

Talcher coalfield is located in the district of Anugul. It has a huge reserve of non-coking coal. This district is also called as the district of black diamond. Because of the heavy deposits of black diamond the coal mine industry spreaded between 50 kilometre radius which covers major urban areas of Talcher Municipality and Angul NAC. In Talcher there are 7 open-cast mines namely Balanda, Jagannath, Ananta, Kalinga, Bharatpur, Hingula and Lingaraj. Three underground mines are also operating there. They are: Deulabeda, Talcher and Nandira. The open-cast mines in Talcher-anugul belt are very effective than underground mines. According to the statistical data 2737 families have been displaced and Thousands of acres of land have been dunged because of coal mining in Talcher.

The present study was confined to the Talcher coalfield. The state's inland area where the study area is located is a poverty ridden area where both tribal and non-tribal communities are residing. It is considered as one of the most polluted area in world. The significant problem in this area is that of water scarcity. Although this area is situated close to the Hirakud reservoir, but ironically this area has been declared as a drought prone area. The peoples do not get potable drinking

water whereas the industries are withdrawing huge quantities of water for their industrial operations. The cause of water pollution in this belt is the release of waste water from MCL & NTPC. Coal mining activities in this area was started during mid-eighties. Over the years mining operations have accelerated in this area but there is a dearth of research regarding the socio-economic and environmental impacts of coal mining. This study intends to fill these lacunae.

Sampling Procedure

In this present study the targeted population consists of those who bear the negative costs of mining. In this case, Talcher coalfield of MCL coalfield is geographically well defined. So the population was easy to identify by taking all the villages, which are affected by the mining activities. In the first stage, listing of all those villages, was undertaken which are near the mines. Given the choice of a target population, the next step was to put together a list of the target population, known as the sample frame population, from which, ultimately, the sample was drawn. Secondly, a list of 06 villages was undertaken according to stratified random sampling procedure. The strata were decided on the basis of the distance[2] from the mine. The significance of selection of the villages in this particular way is to capture the variations in the impact of livelihood due to mining activities. The closer a village is to the mines the more is the probability that is affected by the mining. Since mines have started operation 20 years ago it is difficult to go for a before and after analysis. Instead, with and without comparison will be carried out. For the purpose of with and without comparison two more villages are selected that are not affected by mining but belong to the same district, as control villages. In the last stage from each sample villages households were selected on the basis of circular random sampling methods for final study.

[2] The villages are categorized according to the distance from the mine- (i) within 3 km; (ii) 3.01 to 6 km; and (iii) 6.01 to 9 km. From each category 2 villages will be selected randomly.

Indicative Sample

Samples	No. of Villages	Distance from vicinity	No. of Sample	Total Sample
Affected by mining (Experimental group)	2	3	75@2	150
	2	6	75@2	150
	2	9	75@2	150
Non-mining affected (Control Group)	2		75@2	150
Total				600

DATA COLLECTION

In order to fulfill the objectives of the study, data was collected from both primary and secondary sources. For primary data collection apart from quantitative techniques, the present study used qualitative anthropological tools. As part of qualitative data collection, the techniques like observation (both participant and non-participant), case study, key informant interview, formal and informal interviews, and some of the PRA techniques like focused group discussions, resource maps and seasonal analysis were used. For gathering quantitative data household survey was conducted using the pre-tested schedules. The secondary data was collected from official records, policy documents, published reports of similar projects, journals and literature form social science discipline. Sound level meter (SLM) was used to measure the noise level.

DATA ANALYSIS

Both qualitative and quantitative data was analyzed in the backdrop of the project objectives. Quantitative data was tabulated and statistically analysed using SPSS software. Qualitative data was interpreted based on the information collected from the field using qualitative data analysis techniques, such as content analysis.

In this study, three major impacts are included. They are impact on social structure, health, ecology and livelihoods. While collecting data and analysing report some variables like gender, age, education, community, caste, illness, land holding size, livelihood, closeness to mining area and displaced community were taken into consideration.

IMPLICATION

There is very limited work done on the Mining aspect of Odisha. Whoever has done that is mostly from economics perspectives. It is very rare to see the study done from interdisciplinary perspectives of mining. And the study on the impact of Mining on social structure, culture, agricultural productivity, health and livelihood will be a value addition to the field of environment sector of Odisha. Findings of the study would be used to draw strategies to enhance the coping capacity with regard to the impacts of coal mining on the socio-economic lives of the people, who are living in the vicinity. Corrective strategies would include macro-level policies (such as pricing and compensation) and local institutions and mechanisms. This kind of a study would reveal the role of NGOs, People's participation in the implementation of the policy of the Government. Thorough research on this topic will be useful to policy makers, academicians, administrators, planners and etc. in different phases of the implementation of the policy.

2. PROFILE OF THE STUDY AREA

COAL MINING IN INDIA

Globally, coal resources have been projected at over 861 billion tons. While India accounts for 293.5 billion tons of coal resources (as on 31 March 2012), other countries with major portion of resources are USA, China, Australia, Indonesia, South Africa and Mozambique. Coal meets around 30.3% of the global primary energy needs and generates 42% of the world's electricity (World Coal Association, 2014). In 2011, coal was one of the fastest growing forms of energy after renewable sources and its share in the global primary energy consumption increased to 30.3% highest since 1969. Coal production in the Asia Pacific region has grown tremendously and accounts for over 67% of the total production globally (2012) as compared to about 27% in 1981 (in terms of energy equivalent). India has the fifth largest coal reserves in the world. Of the total reserves, nearly 88% are non-coking coal reserves, while tertiary coals reserves account for a meager 0.5 % and the balance is coking coal. The Indian coal is characterized by its high ash content (45%) and low sulphur content. The power sector is the largest consumer of coal followed by the iron and steel and cement segments.

India has a long history of commercial coal mining covering nearly 230 years. In 1774, at the insistence of Warren Hastings, Governor General during British rule, the manufacture of arms and ammunition work was awarded to M\S Sumner and Heatly for commencing coal mining operations for the first time in the country on the western banks of Damodar river. The mines were of small opencast types, manually mined in the land area between Disergarh and Raniganj town. In 1815, the first underground mining operations were started in one of the mines near the Raniganj town. In 1835 the entire mining operation which was being carried on passed into the hands of Prince Dwarkanath Tagore and Carr. Tagore and Co.[3] was formed.

Carr. Tagore and Co. and another company M\S Gilmore Homefrav and Company were amalgamated in 1843 to form the first joint stock coal company in India and were known as Bengal Coal Company limited. Due to the opening of the Indian Railways and the introduction of the steam engine the demand for coal increased. Coal production increased from 90,000 tons

[3] This is the first Indian MNC founded by Dwarakanath Tagore.

per year in 1850 to 6.12 million tons (Mt) in 1900. The increase was due to the expanding network of Indian Railways. Within a short span, production rose to an annual average of 1 Mt and India could produce 18Mt per year by 1920 and 30 Mt per year by 1946.

After Independence, the country introduced the 5 year development plans. In the last year of the first Five Year Plan (FYP) coal production was 38.4 Mt. In the second FYP stress was given on building heavy industries in the country and accordingly the demand for coal increased substantially to 60Mt. Due to the increasing demand for coal it was felt by the then government that the existing network of companies could not meet the supply, so they wanted to restructure. Accordingly, the 11 collieries which were under different railway companies were brought under one umbrella and the first coal company of the Central Government was incorporated in October 1956 and was called the National Coal Development Corporation (NCDC). Along with the Singareni Collieries Company Limited (SCCL), which was already in operation since, 1945 and which became a government company under the control of Government of Andhra Pradesh in 1956, India thus had two government coal companies in the fifties.

NATIONALIZATION OF COAL MINES

Right from its origin, the commercial coal mining in modern times in India has been dictated by the needs of the domestic consumption. On account of the growing needs of the steel industry, a push had to be given on systematic exploitation of coking coal reserves in Jharia Coalfield. Adequate capital investment required to meet the growing energy needs of the country was not forthcoming from the private coal mine owners. Unscientific mining practices adopted by some of them and poor working conditions of labour in some of the private coal mines became matters of concern for the Government. On account of these reasons, the Central Government took a decision to nationalise the private coal mines. The nationalization was done in two phases, the first with the coking coal mines in 1971-72 and then with the non-coking coal mines in 1973. In October, 1971, the Coking Coal Mines (Emergency Provisions) Act, 1971 provided for taking over in public interest of the management of coking coal mines and coke oven plants pending nationalisation. This was followed by the Coking Coal Mines (Nationalization) Act, 1972 under which the coking coal mines and the coke oven plants other than those with the Tata Iron & Steel

Company Limited and Indian Iron & Steel Company Limited, were nationalized on 1.5.1972 and brought under the Bharat Coking Coal Limited (BCCL), a new Central Government Undertaking. Another enactment, namely the Coal Mines (Taking over of Management) Act, 1973, extended the right of the Government of India to take over the management of the coking and non-coking coal mines in seven States including the coking coal mines taken over in 1971. This was followed by the nationalization of all these mines on 1.5.1973 with the enactment of the Coal Mines (Nationalisation) Act, 1973 which now is the piece of Central legislation determining the eligibility of coal mining in India.

FORMATION OF COAL COMPANIES

The Coking Coal Mines (Emergency provisions) Ordinance was promulgated by the Government of India on 16.10.1971 under which except the captive mines of TISCO and IISCO, the management of all coking coal mines was taken over by the government. A new company called Bharat Coking Coal Limited (BCCL) was formed as a subsidiary company of Steel Authority of India Limited (SAIL) to manage the mines taken over by the Government. These mines were subsequently nationalized w.e.f. 1st May 1972. Later on the management of 711 coal mines was also taken over by the government with effect from 31.1.1973 and they were nationalized w.e.f. 1st May 1973. A new Government company namely, Coal Mines Authority Limited (CMAL) with headquarters at Calcutta, was set up by the government in May, 1973 to manage non-coking coal mines.

The CMAL was organized as a unitary structure on divisional pattern with four divisions, the Central Division, the Eastern Division, the Western Division and the Central Mine Planning and Design Institute Limited (CMPDIL). The mines of erstwhile NCDC were brought under the Central Division of CMAL. In September 1975, Coal India Limited (CIL) was formed as a holding company with five subsidiaries namely Central Coalfields Limited (CCL), Eastern Coalfield Limited (ECL), Western Coalfields Limited (WCL), BCCL and CMPDIL.

In view of the projected increase in production and investment contemplated for CCL and WCL group of coal mines and in view of their extensive geographical spread resulting in day to day administrative, technical and communication problems, etc., two more coal companies, namely, Northern Coalfields Limited (NCL) and South Eastern Coalfields Limited (SECL) were formed

w.e.f. 28.11.1985. Considering the prospects of Orissa Coalfields, being the growth center for the VIII and IX plan periods, a new company Mahanadi Coalfield Limited (MCL) was incorporated on 3rd April, 1992 with its headquarters at Sambalpur as fully owned subsidiary of CIL to manage the Talcher and Ib Valley coal fields in Orissa.

CIL has now eight subsidiaries viz. BCCL, CCL, ECL, WCL, SECL, NCL, MCL and CMPDIL (Table 2.1). The CMPDIL is an engineering, design and exploration company set up for preparing perspective plans, rendering consultancy services and undertaking exploration and drilling work to establish coal reserves in the country and collection of detailed data for preparation of projects for actual mining. The other seven subsidiaries of CIL are coal producing companies. CIL and its subsidiaries are incorporated under the Companies Act, 1956 and are wholly owned by the Central Government. The coal mines in Assam and its neighboring areas are controlled directly by CIL under the unit North Eastern Coalfields Limited (NECL). In addition to CIL and its subsidiaries there is another coal company in Public Sector namely SCCL, which is a joint venture of Government of Andhra Pradesh and Government of India sharing SCCL's equity capital in the ratio of 51:49. Now India is the third largest coal producing country. CIL contributes around 85 percent of coal production in the country. It is the largest company in the world in terms of coal production.

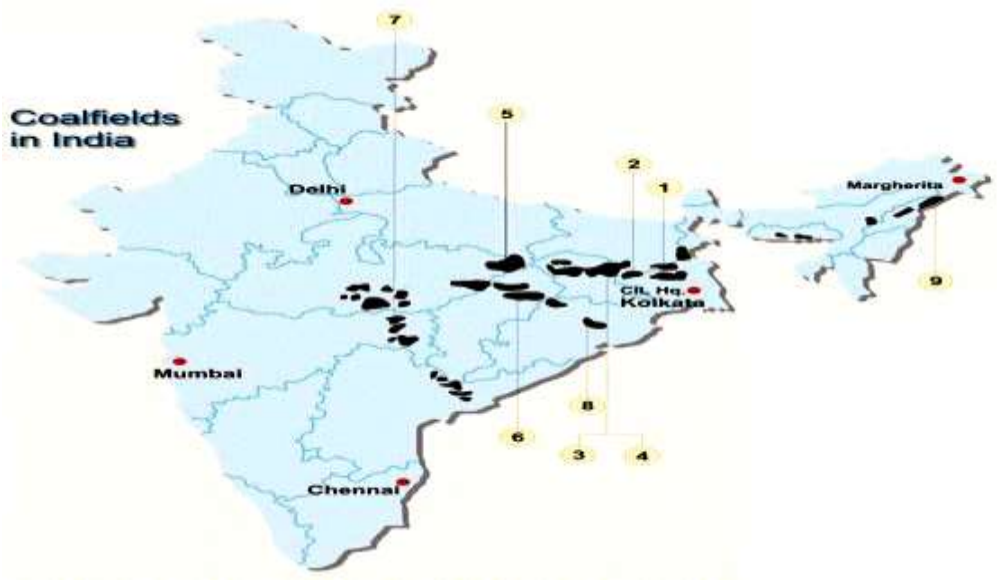
Map 1.1 shows the location of different coalfields of India and the headquarters of all 8 subsidiaries. CIL's head quarter is in Kolkata. There are also regional sales offices in Chandigarh, Delhi, Jaipur, Mumbai, Ahmedabad, Lucknow, Patna, Ranchi, Bangalore, Chennai and Kolkata.

Table No. 2.1: CIL and its Subsidiaries

Sl.No	Coalfields	Established	Headquarter	Total Mines
1	ECL	1975	Sanctoria (WB)	**112**
2	BCCL	1973	Dhanbad	**80**
3	CCL	1975	Ranchi	**63**
4	CMPDIL	1975	Ranchi	**-**
5	NCL	1986	Singrauli	**8**
6	SECL	1986	Bilaspur	**97**
7	WCL	1975	Nagpur	**80**
8	MCL	1992	Sambalpur	**23**
9	**NECL**	**-**	**Margherita**	**07**

Source: http://coalindia.nic.in

Map 2.1: Coalfields in India



1	ECL	6	SECL
2	BCCL	7	WCL
3	CCL	8	MCL
4	CMPDIL	9	NECL
5	NCL		

Source: http://coalindia.nic.in

COAL RESERVES IN INDIA

India with 2.7 percent of the world reserves ranks sixth in the world in coal resources. Most of the coal reserves in India are concentrated in the peninsular part with in 78 to 88 degrees east longitude and 22 to 24 degrees north longitude. A total of 253.30 Billion Tonnes(Bt) of coal reserves are estimated by Geological Survey of India(GSI) as on 1.1.2006 of which the 'prime' coking coal[4] are 5,313 Bt, medium and semi-coking coals are 26.784 Bt and non-coking coals[5] are 221.205 Bt .

[4] Coking coal with low ash and phosphorous contend is used to make coke, which is an ingredient in steel production.

[5] Non coking coal with high ash contends is used in power stations, where coal heats water to produce steam. This steam then powers the turbines which produce electricity.

India's major workable coal deposits occur in two distinct stratigraphic horizons- Permian, commonly known as 'Gondwana'[6] coals and the Tertiary[7]. The Gondwana coals are largely confined to river valleys such as the Damodar (West Bengal and Bihar), Mahanadi (Orissa) and Godavari (Maharastra and Andhra Pradesh). Coal fields of Assam of Jaintia and Banail series belong to the Tertiary age. The lignite deposits of Jammu and Kashmir, Kerala, Tamil Nadu and Gujarat are also of Tertiary age.

Jharkhand, Orissa, Chhatisgarh and West Bengal account for about 90 percent of India's coal reserves. Jharkhand alone has about one third of the total reserves in the country. The increase in reserves is mostly because of revisions in reserve estimates. Jharkhand is having the highest reserves placing Orissa in the second and Chhattisgarh in third (Figure 2.1). Talcher coalfield in Orissa is the single largest coalfield in India with coal reserves of 39.64 Bt. Other large coal fields include Ib Valley in Orissa with 22.36 Bt, Raniganj coal fields in West Bengal with 22.62 Bt and Jharia in Jharkhand with 19.43 Bt of reserves. Coking and superior quality coals are found mostly in the eastern region, mainly in the Jharia and Raniganj coalfields.

COAL RESERVE IN ODISHA

Coal deposits are mainly confined to eastern and south central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Andhra Pradesh, Maharashtra and Madhya Pradesh account for more than 99% of the total coal reserves in the country. As on 31.03.12 the estimated reserves of coal was around 293.5 billion tones, an addition of 7.64 billion over the last year. The total estimated reserve of coal in India as on 31.03.11 was around 285.86 billion tonnes. In India coal reserve is mainly concentrated into two regions i.e. Gondwana and Tertiary coalfields. A detailed description is given below:

[6] A region of central India comprising of eastern part of the Vidarbha region of Maharashtra, the part of Madhya Pradesh immediately to the north of it and part of west of Chhatisgarh. The wider region extends beyond these, also including parts of northern Andhra Pradesh and western Orissa.
[7] Geological time is divided into primary, secondary and tertiary periods based on observations of geology.

Table No. 2.2
Gondwana Coalfields

State	Geological Resources of Coal (in Million Tonnes)			
	Proved	Indicated	Inferred	Total
Andhra Pradesh	9566.61	9553.91	3034.34	22154.86
Assam	0	2.79	0	2.79
Bihar	0	0	160.00	160.00
Chhattisgarh	13987.85	33448.25	3410.05	50846.15
Jharkhand	40163.22	33609.29	6583.69	80356.20
Madhya Pradesh	9308.70	12290.65	2776.91	24376.26
Maharashtra	5667.48	3104.40	2110.21	10882.09
Odisha	25547.66	36465.97	9433.78	71447.41
Sikkim	0	58.25	42.98	101.23
Uttar Pradesh	884.04	177.76	0	1061.80
West Bengal	12425.44	13358.24	4832.04	30615.72
Total	**117551.01**	**142069.51**	**32383.99**	**292004.51**

Source: ***http://www.coal.nic.in/welcome.html***

Table No. 2.3
Tertiary Coalfield

State	Geological Resources of Coal (in Million Tonnes)			
	Proved	Indicated	Inferred	Total
Arunachal Pradesh	31.23	40.11	18.89	6.00
Assam	464.78	42.72	3.02	2.52
Meghalaya	89.04	16.51	470.93	443.35
Nagaland	8.76	0	306.65	298.05
Total	**593.81**	**99.34**	**799.49**	**749.92**

Source: ***http://www.coal.nic.in/welcome.html***

COAL PRODUCTION IN INDIA

Production of coal grew at a rate of 6.25 percent per annum during the eighties. This was a much higher rate than the 2.85 percent per annum increase recorded during the sixties and 4.68 percent in seventies. During the late sixties and early seventies coal production remained stagnant at 70 Mt per annum. Following the nationalization of coal industry and with emphasis on opencast mines coal production again rose in the eighties. The current production mix of opencast and underground mining is an outcome of a shift towards increased opencast mining for obtaining bulk production in a short time frame (CMIE 1996). Coal India a major player in mining of coal produce 431.32 Million Tones at financial year ending 2011 and targeted 452

Million Tones at 2012 financial year ending (Source Coal India Limited). Coal/Lignite based thermal power plant is 88 Number with installed capacity 80458 MW (Source Central Electricity Authority, 2010) which consumed 407.61 Million Tones (Source Central Electricity Authority, 2010) of coal. While in 2012, 90 numbers of Coal/lignite based thermal power plant with installed capacity of 83797MW production (Source Central Electricity Authority, 2012). The annualized production of coal is shown in the following table.

Table No. 2.4: Plan period-wise coal production trend and annualized growth rate (CAGR)

Plan Period	Terminal Year	Production (Mty)	CAGR (%)
I Plan	1955-56	38.40	
II Plan	1960-61	55.72	7.73
III Plan	1965-66	70.30	4.76
IV Plan	1973-74	78.18	1.24
V Plan	1978-79	102.02	5.47
VI Plan	1984-85	147.44	7.24
VII Plan	1989-90	203.36	6.64
VIII Plan	1996-97	289.32	4.76
IX Plan	2001-02	327.79	2.53
X Plan	2006-07	430.83	5.62
XI Plan (P)	2011-12	554.00	5.16

Source: (Coal Controller's Organization)

For the duration of 1950-51, the production of coal was only 32.30 million tonnes. It amplified reasonably during the anticipation of 1970-71 (72.95 million tonnes). But the production of coal indicated a tremendous growth during the period of 1980-81 to 1999-2000. During 1980-81, the production of both coking (metallurgical/non-metallurgical) and non-coking coal was 113.91 million tonnes and by 1989-90, the production crossed the boundary of 200 million tonnes. The production was almost stagnant between the period of late sixties and early seventies. But the emphasis on opencast mines as well as the nationalization of coal mines during the early seventies turned out to be the means of production. At the end of nineties the production grasped the level of 300 million tonnes by employing additional help from modern technologies. Since the early part of twenties till yet the production is proving its excellence as in 2013-14 the production was 565.8 million tonnes. However, the estimated production during 2014-15 is 426.7 million tonnes (provisional). The details of the production from 1951-2015 are given below:

Table No. 2.5: Production of Coal during 1951-2015
(In Million Tonnes)

Year	Coking Coal		Non-coking Coal	Total
	Metallurgical	Non-metallurgical		
1950-51	na	na	na	32.30
1960-61	16.99	na	38.24	na
1970-71	17.82	na	55.13	na
1980-81	24.59	8.03	81.29	113.91
1981-82	26.89	9.23	88.11	124.23
1982-83	30.10	7.47	92.93	130.50
1983-84	30.11	6.24	101.87	138.22
1984-85	30.57	6.04	110.80	147.41
1985-86	29.07	6.57	118.56	154.20
1986-87	27.91	11.63	126.23	165.77
1987-88	26.28	14.73	138.71	179.72
1988-89	25.16	17.56	151.88	194.60
1989-90	24.50	19.93	156.46	200.89
1990-91	24.10	21.20	166.43	211.73
1991-92	26.33	19.95	183.00	229.28
1992-93	25.72	19.64	192.90	238.26
1993-94	25.99	19.07	200.98	246.04
1994-95	24.54	19.71	209.55	253.80
1995-96	23.53	16.57	230.03	270.13
1996-97	22.64	17.90	245.12	285.66
1997-98	24.16	19.34	252.43	295.93
1998-99	23.82	15.36	253.09	292.27
1999-2000	21.23	12.02	266.72	299.97
2000-01	19.31	11.77	278.55	309.63
2001-02[a]	17.96	10.71	299.12	327.79
2002-03[a]	18.35	11.84	311.08	341.29
2003-04	18.27	11.13	331.85	361.25
2004-05	18.19	12.03	352.39	382.61
2005-06	16.97	14.54	375.53	407.04
2006-07	17.23	14.87	398.74	430.83
2007-08	18.07	16.39	422.63	457.08
2008-09	17.30	17.51	457.95	492.76
2009-10	17.73	26.68	487.63	532.04
2010-11	17.70	31.85	483.15	532.69
2011-12	16.20	35.46	488.3	540.0
2012-13	14.6	37.0	504.8	556.4
2013-14	9.7	47.1	509.0	565.8
2014-15[*]	---	---	---	426.7

Source: *http://indiabudget.nic.in/es2014-15/estat1.pdf*
Note: na: not available, [a]: including Meghalaya coal, [*]: up to December 2014

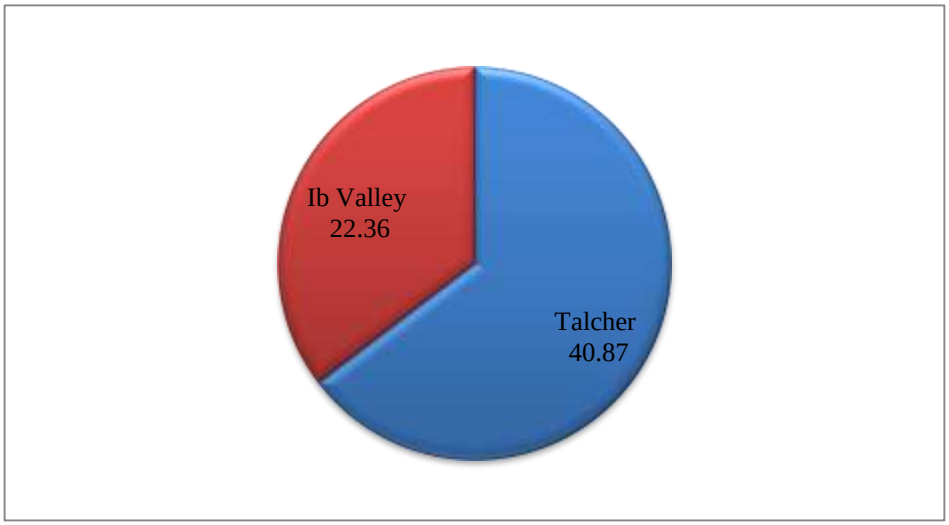
With the dawn of independence, the country shifted focus upon the 5-year development plans. At the beginning of the 1st Plan, annual production went up to 33 million metric tons (38 million short tons). During the 1st Plan period itself, the need for increasing coal production efficiently by systematic and scientific development of the coal industry was being felt. National Coal Development Corporation (NCDC), was set up as a Government of India Undertaking in 1956 with the collieries owned by the railways as its nucleus was the first major step towards planned development of Indian Coal Industry. Along with this the Singareni Collieries Company Ltd. (SCCL), which was already in operation since 1945 became a Government company under the control of Government of Andhra Pradesh in 1956. India thus had two Government coal companies in the fifties. SCCL is now a joint undertaking of Government of Andhra Pradesh and Government of India sharing its equity in 51:49 ratios.

COAL MINING IN ODISHA

Odisha is one of the mineral rich state especially coal point of view. The state has about a quarter of the total coal reserves of the country. Though mining of minerals and extraction of metals were in practice in ancient Odisha. Modern mining as per available records started in 1909, when coal was first excavated in the Rampur area of Ib valley. Over the years the mining activity has been accelerated to meet the demand of the public & private sector. Coal has been known as the alternative source of energy. In the year 1992 Mahanadi Coalfield Limited, a subsidiary of Coal India formed for Odisha. And after that all the mines those are coming under the Coal India subsidiaries in Odisha came under MCL. The IB Valley and Talcher coalfield are two main coal fields of Orissa where coal reserves and consequently coal mining activities are concentrated

According to Indian Energy Sector of India a total of 298.91 billion tonnes of coal reserves are estimated as on 1st April 2013. Jharkhand is the state with highest reserves of 80.70 billion tonnes placing Odisha in the second with 73.71 billion tonnes. Orissa has two coalfields i.e. Talcher and Ib Valley. Talcher coalfield is having coal reserves of 40.87 billion (64.64%) tonnes and Ib Valley coalfield has 22.36 (33.36%) billion tonnes of coal reserves. This can be viewed in the following figure:

Figure 2.1: Coalfield-Wise Coal Reserves in Odisha



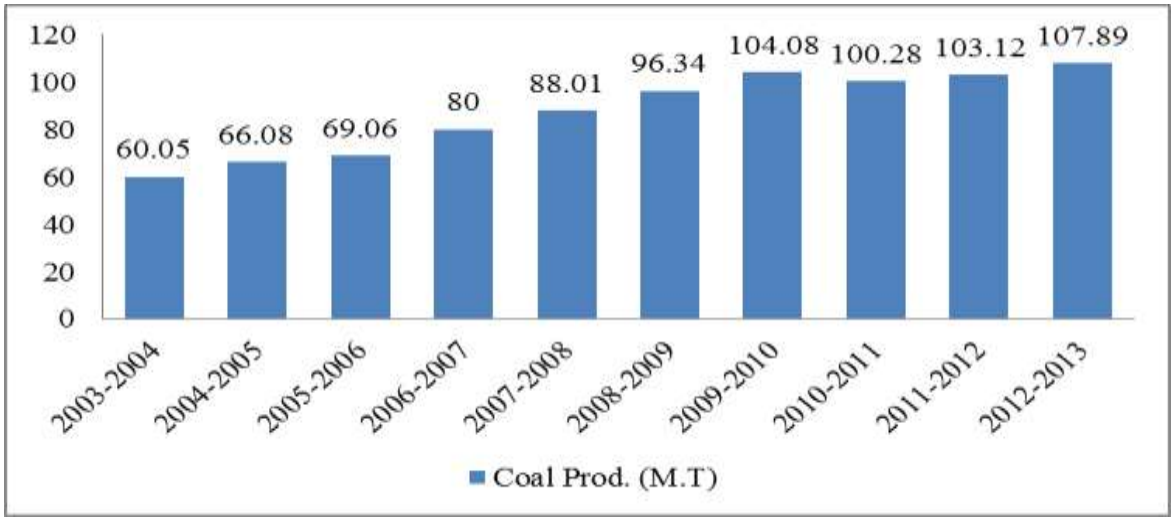
Source: *http://www.mahanadicoal.nic.in*

Talcher coalfield is lying between latitudes 20^0 53' N and 20^0 12' N and longitude 84^0 24' E and 85^0 33' E. It is situated in Angul district of Orissa. It was first started at Gopalprasad in the year 1837. Since the sixties, there has been a steady increase in coal production from Talcher coalfield. Coal production was 0.91 Mt in 1972-73, the year of nationalization; the production became 13.80 Mt in the year 1991-92 just before the formation of MCL and 42.06 Mt in 2003-04. The coal reserve of Mahanadi Coalfields Limited is spread over two Coalfields viz., Talcher and IB Valley with Ten (10) operating Areas consisting of Seven (7) Underground and Sixteen (16) Open Cast Projects. The operating Areas are as under: It has 5 areas viz. Jagannath, Hingula, Lingaraj, Kalinga and Talcher. Ib valley coalfield is situated in the Jharsuguda and Sundargarh district of Orissa.

PRODUCTION AND PRODUCTIVITY OF COAL IN ODISHA

During the year of inception of MCL, i.e.2003-04, the coal production was 60.05 Mt, which has grown up to 107.89 Mt by the year 2012-13 (Figure 2.2). Production of coal is increasing over the years. The data in the table 2.3 shows that by end of 2013 the MCL has produced around 696.04 lakh tonnes of coal. While 454.84 lakh tonnes are being produced by Talcher coal field, 241.20 lakh tonnes are by IB valley coalfield.

Figure 2.2: Year wise Coal Production by MCL



Source: http://mahanadicoal.nic.in

Table No. 2.6: Field – Wise Coal Production in MCL region of Odisha (in lakh tonnes)

Coalfield	Grade B/C/D	Grade E/F	Total
Talcher Coalfield	6.99	447.85	454.84
Ib valley Coalfield	15.90	225.30	241.20
Total MCL	22.89	673.15	696.04

Source: www.mahanadicoal.nic.in

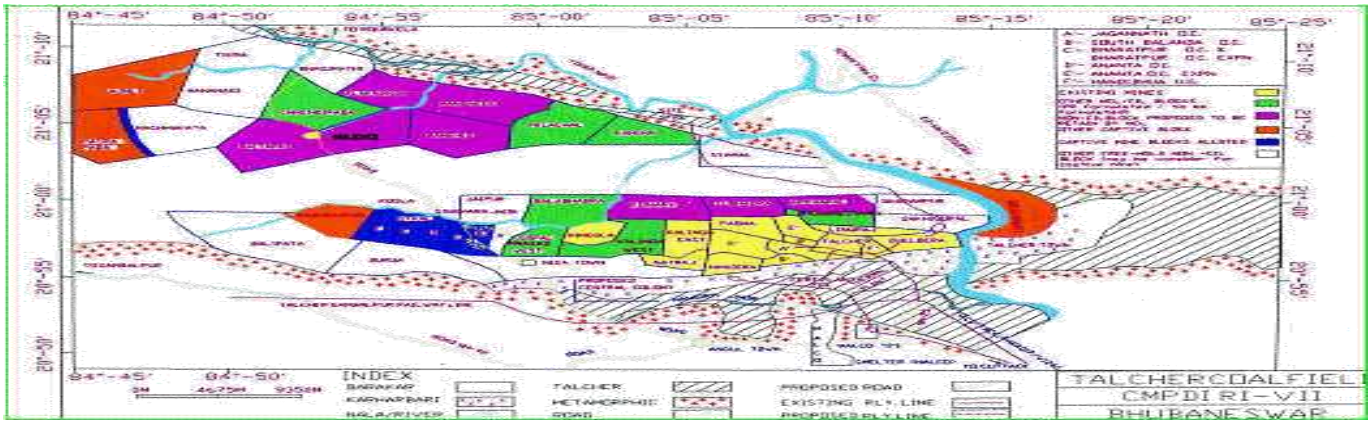
COAL MINING IN TALCHER

Talcher is one of the 4 sub-divisions of Angul district of Odisha. Situated on the right bank of the river Brahmani, Talcher is one of the fastest growing industrial and mining complexes of the country mostly known as coal town of the state. Talcher was coming under the undivided Dhenkanal district till 1993 but for administrative convenience it was divided into Dhenkanal and Angul. Talcher coalfield (150966 sq.km area) is located in Brahmani valley to the north of Mahanadi River in the Talcher block of Angul district, about 120 km away from Bhubaneswar, the capital city of Odisha (MCL, Archives, 200). Brahmani river and its tributaries namely Singhra, Tikiria and Nandira are the main water sources flowing at Talcher locality. Presence of

rivers is always a reliable source towards irrigation but in the contest of Talcher there is no significant development in agriculture. Above all companies like Mahanadi Coal Fields Limited (MCL), National Thermal Power Corporation (NTPC), Talcher Thermal Power Station and JINDAL are strengthening economy for decades. Talcher coalfield comes under Mahanadi coalfield limited (MCL), a public sector coal subsidiary of Coal India limited (CIL). It was established on 3rd April, 1992 with its headquarters at Sambalpur. It has acquired Mini Ratna Category-I status on 15.3.2007 for its better performance in term of coal production and profit generation (MCL, Archives, 2007: 5.6). A huge non-coking coal deposits suitable for thermal power plant attract the prospect of coalmining projects at Talcher- Angul belt.

Talcher coalfield has eight opencast and three underground coal mines in its five coal areas namely Jagannath area, Bharatpur area, Lingaraj area, Hingula area and Talcher area. From these coal areas of Talcher coalfield a total of 12719.134 hectares of land have been acquired by coal mines through Coal Bearing Act (CBA) (A & D) 1957, and LA Act 1894 till 31st March, 2014 (Land Acquisition Department, MCL,2014). As per the official document of MCL by end of March, 2014 around 8354 persons were sponsored by the coal mining projects for employment. According to MCL Archives eight opencast coal mining projects namely Jagannath OCMP, Ananta OCMP, Bharatpur OCMP, Balaram OCMP, Hingula OCMP, Lingaraj OCMP, Bhubaneswari OCMP and Kaniha OCMP had affected 9231 families and out of them only 4806 families are resettled by end of March, 2014

Map 2.2: Talcher Coalfield



Source: *http://mahanadicoal.nic.in*

Picture 2.1: MCL Mining Talcher Area

Source: Field Study

INTRODUCTION OF THE STUDY AREA

The study concentrates on the Talcher coalfield of Odisha. The state has two coalfields. One is talcher coal field and another is IB valley coalfield. The Talcher coalfield covers an area of 150966 sq.km. As per the 2001 census, there are 143603 populations living in this area, of which 16 per cent belongs to scheduled caste and 7 per cent belongs to scheduled tribe (District Statistical Hand Book, Angul, 2009). Brahmin river and its tributaries namely Singhra, Tikiria and Nandira are the main water sources flowing at Talcher locality. Talcher coalfield comes under Mahanadi coalfield limited (MCL), a public sector coal subsidiary of Coal India limited (CIL). It was established on 3rd April, 1992 with its headquarters at Sambalpur. It has acquired Mini Ratna Category -I status on 15.3.2007 for its better performance in term of coal production and profit generation (MCL, Archives, 2007: 5.6). Talcher coalfield has eight opencast and three underground coal mines in its five coal areas namely Jagannath area, Bharatpur area, Lingaraj area, Hingula area and Talcher area. According to MCL Archives eight coal mining opencast projects namely Jagannath OCMP, Ananta OCMP, Bharatpur OCMP, Balaram OCMP, Hingula OCMP, Lingaraj OCMP, Bhubaneswari OCMP and Kaniha OCMP.

In the present study, the impact of three opencast coal mining projects namely Lingaraj OCMP, Bhubaneswari OCMP and Bharatpur OCMP at Talcher coalfield in the Angul district of Odisha. The sample consist of six villages situated near the coal mines called mining affected villages i.e. Balunga khamar, Langijoda, Naraharipur, Hensmul, Danara and Jambu bahali and two villages,

which are away from the coal mines called control village i.e. Deragoda and Saradhapur but belongs to the same district. The information was collected through structured household schedule. The households were selected using the random sampling method. In total 600 household were selected, 450 from the mining affected villages and 150 from the control villages.

Key Features of the Sample Villages

The study was undertaken in six mining villages and two control villages[8]. The basic features of both types of villages have given in the Table no 2.7.

Table No. 2.7: Key Features of Sample Villages

Features	Mining Villages						Control Villages	
	Balungakhamar	Langijoda	Danara	Jambubahali	Hensmul	Naraharipur	Deragoda	**Saradhapur**
Distance from nearby mines (in km)	6-9	6-9	3-6	3-6	0-3	0-3	25	**20**
Total population	880	654	1595	1020	1112	1100	400	**500**
Social Composition	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	**Mixed**
Total Households (No's)	140	90	207	158	167	105	90	**130**
Livelihoods	Mine's employee and day labourer	Mine's employee and day labourer	Mine's employee and day labourer	Mine's employee and day labourer	Mine's employee and day labourer	Mine's employee and day labourer	Agriculture and day labourer	**Agriculture and day labourer**
Electricity	Available	Available	Available	Available	Available	Available	Available	**Available**
Source of Drinking water	**Tube well**	**Village bore well**	**Village bore well**	**MCL is providing**	**MCL is providing**	**MCL is providing**	**Tube well**	**Tube well**

Source: Field Study

Notes: Social Composition includes all categories: SC, ST and OC. High School (Up to class 10th), Primary School (Up to class 5th), Upper Primary School (Up to class 7th).

[8] A detailed of selection of villages and households is given in the introduction chapter.

Picture 2.2: Settlement in Mining Area

All sample villages have mixed population as far as social composition is concerned. Electricity is available in all the villages and they have a primary school and anganwadi centre. There is no irrigation facility in any of these villages and agriculture depends on monsoon. There are differences in economic activities between the mining and control villages. The sources of drinking water also differ. Table 2.8 gives the demographic features of the sample villages.

Demographic profile of the study area

The demographic profile of the sample villages signifies the caste wise representation of the sample households of both experimental and control villages. It also displays the village wise total number of households and the sample households.

Table No.2.8: Demographic Features of Sample Villages

Basic Data	Mining Villages						Control Villages		Total
	Balunga khamar	Langijoda	Danara	Jambu bahali	Hensmul	Naraharipur	Deragoda	Saradhapur	
Total Household	140	90	207	158	167	105	90	130	1087
Sample Household	75	75	75	75	75	75	75	75	600
SC Household	21	3	21	18	6	27	6	25	127
ST Household	1	0	0	0	0	0	4	1	6
OBC Household	40	45	25	55	33	40	49	21	308
General household	13	27	29	2	36	8	16	28	159

Source: Field Study

The above table shows that the first six villages are near the mines, while the last two villages are control villages. The distance between the mining and control villages is between 20 to 30 kilometers. Danara is the village with the maximum number of (207) household, with a population of 1595. Langijoda is the village with the minimum number of (90) household. In the case of control village, Saradhapur is the village with the maximum number of household (130). Deraguda is the village with the minimum of (90) household. In the mining villages, most of the household belongs to other backward casts followed by general castes. In our study area, the total household is 1087 out of that we have taken 600 households for our study.

Annual Income of Family

This study reveals that the income of the affected families of MCL projects has markedly increased in post-project years. This increasing income status shows that non-farm income sources or project based employment sources are fast becoming the alternative options against sustainable agro-based or eco-based livelihood pattern of pre-affected households. As a result, why the displaced families cannot be called as ecosystem people is quite visible. Further, in our focus group discussions many senior most land oustees explain that with the current money income, they cannot meet the requirements and comforts of their increasing and invisible expenditures on food and non-food items. The present study reveals that with the increase in money income of the oustees in post project period there is a huge marked change in their consumption style. The Researcher found that due to mining, the average annual income of the family has greater than before and also much higher than the control village. Just because most of the families are getting employment in the mining project, their income level is more. But in case of control villages, the income level is less. The reason behind their low income level is that, they are depending only on agriculture and other people are working as wage laborers i.e. 100-150 days during a year. In the mining villages around 30% households' annual income is between 2.5 lakh-5 lakh. But in the control villages it is only 1.33%. In the mining affected villages the standard of living is high than the control villages. It is fact that peoples those who could manage to get regular salaried category project jobs are now placed in high income groups with steady flow of income. And their educated children have also got engaged in non-farm employments in and around the coal mining industries. However, the majority of displaced people especially, the weaker and depressed category population did not actualize that opportunity due to their backwardness and illiteracy. But somehow or other

they have also been earning wage income through daily wage labour, contract work and many other non-farm engagements in and around the coal mining industries. This has been revealed in following table no.2.9

Table No. 2.9: Annual Income of the Family

Income	Type of village	
	Mining affected	Control
Below 11000	17	8
11000- 25000	22	75
25000- 50000	74	48
50000- 1 lakh	76	13
1 lakh - 2.5 lakh	83	4
2.5 lakh- 5 lakh	134	2
5 lakh - 7.5 lakh	29	--------
7.5 lakh- 10 lakh	11	--------
Total	450	150

Source: Field Study

Occupation

It has been reported that in the mining villages the permanent sources of occupation is somewhat related to mining activities only. Despite of age and gender all are either permanently engage in mining or some of them are engage indirectly in these activities. But in the control villages the scenario is totally different. The villagers are still dependent on agriculture and some allied activities. A detailed description on the types of occupation has given below:

Table No. 2.10: Occupation of the Household Heads

Occupation	Mining affected	Control Villages
Cultivation	10 (2.2)	71 (47.3)
Dairy	-------	----
Goatery & other animal rearing	-------	4 (2.7)
Daily wage agri-labourer	25 (5.5)	35 (23.3)
Skilled wage labourer	12 (2.7)	1 (.7)
Semi/unskilled wage labourer	108 (24)	25 (16.7)
Service-Private Sector	22 (4.9)	5 (3.3)
Service-govt. Sector	250 (55.6)	3 (2)
Trade/business	13 (2.9)	1 (.7)
Other Self-employed	10 (2.2)	5 (3.3)
Total	450 (100)	150 (100)

Source: Field Study

It is clear from the above table that in the mining affected villages as the primary source of occupation is mining, majority (55.6%) of households are employed in this sector. But in the control villages the primary occupation is agriculture. So a majority (47.3%) of households in the control villages are practicing agriculture. Daily wage agricultural laborers are also high in case of control villages rather than the mining villages. On the other hand skilled and unskilled wage labourers are higher in number in mining villages.

Land holding size

Land is another important physical asset in rural areas. As agriculture is the main source of livelihood in the control villages**,** this percentage of households with land is more. On the other hand, in the mining villages, land is acquired by MCL for mining. So the percentage of households having agricultural land is lesser. All most all the land holding households became landless due to mining in sample villages. Around 96% households became land absentee completely where the rest contributed some percentage (Table No. 2.11).

Table No. 2.11: Extent of acquisition of agricultural land in mining affected villages

Name of the village	**Extent of acquisition of agricultural land**					**Total**
	Total Land	25%	50%	75%	Landless	
Balanga khamar	42	1	1	2	29	75
Langijoda	57	2	1	2	13	75
Hensmul	66	0	0	0	9	75
Naraharipur	55	0	0	0	20	75
Danara	64	0	2	3	6	75
Jambu bahali	70	0	0	1	4	75
Total	354	3	4	8	81	450

Source: Field Study

The analysis of land holding size in both pre and post mining period in affected villages revels that irrespective of land holding sizes all most all the villagers became land less in post mining period. Only 3.33% households are having land in present day. And all the land holding houses are not having more than 2.5 acres of land right now (Table No. 2.12). Data collected from control village shows that around 82.44% households are having land. And their economy is

predominantly depending on agriculture. All most all the farmers are having land bellow 2.5 acers. Only 6% households are having more than 2.5 acres of land (Table No. 2.13).

Table No. 2.12: Household wise land holding Size in both pre and post mining period

Name of the village	Land holding Size										Total	
	Less than I acre		1-2.5 acre		2.5-5acre		5-10acre		10 and above			
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Balanga khamar	15	2	23	2	3	---	3	---	2	----	46	4
Langijoda	9	2	27	3	17	---	7	----	2	---	62	5
Hensmul	5	-----	41	----	13	----	5	---	2	---	66	---
Naraharipur	5	-----	41	------	5	----	4	----	---	---	55	----
Danara	9	3	45	2	7	---	7	---	1	---	69	5
Jambu bahali	12	---	50	1	7	---	2		----	----	71	1
Total	55	7	227	8	52	----	28		7	---	369	15

Source: Field Study

Table No.2.13: Land holding size in the control village

Name of the village	Land holding Size					Total
	Land Less	Less than I acre	1-2.5 acre	2.5-5acre	5-10acre	
Deraguda	9	30 (45.45)	31 (46.96)	5 (7.5)	0	75
Sardhapur	19	22 (39.28)	30 (53.57)	3 (5.35)	1(1.78)	75
Total	28	52	61	8	1	150

Source: Field Study

Note: Figures in parenthesis show the percentage of households to total households

Composition of Sex & Age

Sex and age are two important characteristics of any society. While age is considered as different stages of human life, sex describes the gender of a person. In the present study, male population is predominantly high in both mining and control villages. Majority (50.2%) of the respondents of experimental villages are in the range of 40-60 years. Similarly in the control villages,

majority (43.3%) of the respondents are coming under the age of 40-60 too. A detailed analysis of age and sex of the respondents is given below:

Table No. 2.14: Sex & Age of the Respondents

Age of the Respondents	Mining affected Villages		Control Villages	
	Male	Female	Male	Female
18-40	90 (20)	4 (.9)	41 (27.3)	3 (2)
40-60	216 (48)	10 (2.2)	57 (38)	8 (5.3)
60-80	115 (25.6)	8 (1.8)	38 (25.3)	2 (1.3)
80 & Above	7 (1.6)	0	0	1 (.7)
Total	428	22	136	14
Grand Total	450 (100)		150 (100)	

Source: Field Study

Note: Figures in parenthesis represent the percentage

Educational Status:

Our study reveals that the post-displacement socio- economic status of sample households has changed their demographic profile at present. In our focus group discussion however, some senior oustees acknowledge the impact of mining caused urbanization, and of establishment of numerous schools in and around Talcher coal belt for their increased literacy rate at present. But we have seen in the control village, the education system is most horrible. The table drawn below shows that though the percentage of illiteracy is same (18.7%) in both the study areas, the percentage of people going for higher education is very less in case of control villages. While 2.9% respondents in mining affected villages are having the qualification of graduation and above, only 0.7% respondents in control villages are having the same. The introduction of mining has encouraged few households to go for professional courses. The table below shows that while 1.3% respondents in mining affected villages are having professional education, it is almost nil in case of control villages. Around 29.3% respondents in mining affected villages and 26% in control villages are only literate (Table no.2.15). They are not having any school education. Though, the percentage of respondents going for higher education is higher in mining affected villages in comparison to control villages but it is not up to mark. After mining most of the localities have developed a tendency of either working in mining or engaged in mining related businesses.

Table No.2.15: Educational Status of the Head of the Households

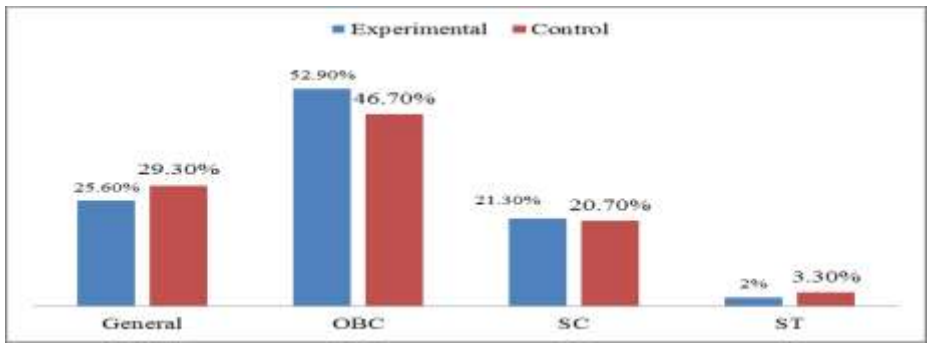
Education	Type of village	
	Experimental Villages	Control Villages
Illiterate	84 (18.7%)	28 (18.7%)
Literate	132 (29.3%)	39 (26%)
Primary	58 (12.9%)	36 (24%)
Middle	66 (14.7%)	27 (18%)
Matriculate	68 (15.1%)	15 (10%)
Intermediate	23 (5.1%)	4 (2.7%)
Graduate and above	13 (2.9%)	1 (.7%)
Professional qualification	6 (1.3%)	……
Total	450	150

Source: Field Study

Ethnic Composition

The sample households selected for the study cover households from various caste and ethnic communities. All the sample households belong to Hindu religion. Majority (52.90%) of them belongs to other backward castes and mostly belonging to Kumbhar, Chasa, Guria and Teli communities. The second highest category is Scheduled Tribe (21.30%) followed by general category (25.60%) who are mostly belongs to Brahmin and Karana castes. All of them are highly affected families as they have lost their agricultural lands, dwelling structures, village environments, village ecosystems, etc. due to coal mining activities for last several decades. Similarly, in the context of control village, majority of them are coming under other backward castes (46.7%) which covers Chasa, Gauda, Guria, Teli etc, In the same way general categories (29.3%) occupy second rank followed by scheduled castes (20.70%). This has been clearly shown in the following figure 2.3.

Figure 2.3: Caste wise division of the household in Study Area



Source: Field Study

Social Organisation

Ogburn and Nimkoff have defined organization as an articulation of different parts which perform various functions; it is an active group device for getting something done. Similarly social organisation denotes the pattern of relationships among the among the individuals in a group. In the present study it has been observed that in the mining affected villages with the intrusion of mining activities the inclusion of different cultures was undertaken. Though it definitely affected the traditional pattern of marriage, family, kinship relation, jajmani system, political structure and power relations, still these organisations were available there in an entirely new form.

3. COAL MINING AND ITS IMPACT ON SOCIAL STRUCTURE

Mining has played a critical role in tailoring human development not only from an economic perspective, but also from the social context. It has a significant impact on the social structure and institutions such as family structure, marriage, kinship, festival celebrations, caste and class structure, individual and group behaviour. In order to analyze the impact of mining on the social structure, various perspectives that create and shape the social landscapes need to be considered. Widespread community demands for relevant, direct and sustainable benefits from mineral wealth have been identified as a very recent phenomenon to which companies and governments have to respond in a suitable and satisfying manner (Mining, Minerals and Sustainable

Social impacts are in general understood as "the consequences to human populations from any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society" (Burdge&Vanclay,1996). These impacts can be both positive and negative. The positive impacts leads to social and sustainable development while the negative impacts limit and retard human development (Uglow, 1998). The territory where the mines were set up was not a 'no man's land' at the outset. People lived on the land as agriculturalists, and a number of them had to move to allow the construction of mines. The local villagers and sometimes the entire villages were displaced in the process of building the mines. In return of their land the peasants had to seek compensation from the authorities; but in the process they had to bear the social cost in terms of disintegrated social relationship.

The intervention of the mining activities and the relocation of the villages have affected community structures in rural areas. The effects of mining on local communities includes: damage to homes, culture, and the destruction of the social structure of rural communities. According to Sachhidananda (1989) changes can be seen in the following areas : (a) Displacement from hearth and home (b) Disorganization of village life (c) Process of detribalization (d) Introduction of money economy (e) Shift from egalitarian to class society(e) Changes from community goals to personal achievements (f) Growth of criminal activities(g) Ineffectiveness of the traditional institutions and leaders in controlling social evils (h) Anxiety and stress leading to alcoholism (I) Changes in the family structure. Conjugal and nuclear (j)

Indebtedness (k) Changes in food habits (l) Free mixing between tribal and non- tribals including marriages (m) Illegitimate sexual relationships, rape and exploitation of women (n) Contact of new diseases (o) People embracing new religion (p) Change in dress (q) Change in language.

The present chapter focuses on the social effects of coal mining in Talcher district of Odisha. Coal mining imposes many external costs on its surroundings and the people who reside in these areas. Coal mining is disturbing and destructive for the environment and it also has puts a social cost on the villagers. Mining has lethal consequences on the traditional lifestyle, culture and behaviour of the people.

IMPACT ON FAMILY STRUCTURE

Rural India is a hub of ethnic, linguistic, regional, economic, religious, class, and caste groups. Indian culture is rapidly incurring changes, which is affecting various regions and socioeconomic groups in varied ways. The essential themes of Indian cultural life are learned within the bosom of a family. In the mining affected villages joint families were once very important, the family members worked cohesively when agriculture was the primary occupation of the people but with the advent of coal mining the scenario has changed. Now there is hatred, disparity, conflict and empathy among the kins for getting jobs in the mines. They quarrel and compete among themselves for their economic security.

The joint families in these affected villages are surviving in its nominal form as a kinship group. The displaced villagers are having lucrative jobs ensuing from the availability of better opportunities elsewhere as well as the rising pressure of population on the limited land base. During our field investigation in the mining affected areas it was observed that in most cases two brothers tend to be from two independent families, even within the same village owing to the rising spirit of individualism, regardless of similarity in occupation, even when the ancestral property is not formally partitioned at their native place. MCL after taking the land of the people of the affected villages has provided job to all the major members of a family. However, in case of all or many are minors in a family only one member of the family nominated by the head of the household got a job. Therefore in a family of a father, mother and three minor sons MCL has provided only one job in the family and thus the one with the job leaves the family, builds his own house and gets separated from the remaining members of the family. Even the family where

all major sons got job also got separated and started individual family. The nuclear family is now the characteristic feature of the mining affected villages.

Table No. 3.1: Type of family structure in the affected and control villages

Type of village	Nuclear family structure	Joint family structure	Total	Pre-mining family structure		
				Nuclear family	Joint family	Total
Affected Villages	300(66.7%)	150(33.3%)	450	64(14.2%)	386(85.8%)	450
Control Villages	41(22.3%)	109(72.7%)	150	N/A	N/A	N/A

Source: Field Survey

The above table no. 3.1 clearly indicates that the number of joint families in the mining affected villages has declined than what it used to be before mining. Around 30.9% of the sampled households are having joint family structure in the mining affected villages where as prior to the advent of mining the percentage of joint families in the affected villages was as 85.8%. On the other hand around 66.7% of the sampled households are having nuclear family structure in the affected villages where as the before the advent of mining the percentage of nuclear family was very truncated which was around 14.2%.Villagers exclaimed that a decade ago all the family members were living under the same roof and there was solidarity in all their rituals and festivals. But as the mining activities started in the villages, subsequently the land of the villagers was taken away by the MCL. Economic compulsion and increasing family size led to the disintegration of the joint family structure in the villages.

The emergence of financially independent, career-oriented men and women, who are confident of taking their own decisions and crave to have a sense of individual achievement, has greatly contributed to the disintegration of joint family. The establishment of the mines has speeded up the processes of modernisation in the two areas, and perhaps added greater complexity and unpredictability to 'modernisation'. On the other hand the picture in the control village is completely different. The above table also represents the type of family structure that exists in the control villages. The control villages are in no way affected by the coal mining operations and therefore it is clear that around 72.7% of the households are still continuing the traditional joint family structure whereas around 27.3 % of the household have nuclear family structure. In

the two control villages which have been selected for our field investigation, it was found that agriculture is still the dominant occupation of the villagers. All the kins participate in agriculture related activities and therefore unity is not hampered and so is the family structure. Joint family is still the hall mark family structure in the control villages. The reason behind the same can be attributed to the fact that mining operations have not entered the control villages and people are still continuing the practices which they did before. With the advent of mining operations like that in the affected villages the tenets of modernization such as increase in income manifold times, better standard of living have made its way and therefore villagers are now seeking for more economic gain but are undermining the social cost which the villagers are bearing. On the other no such harbinger of modernisation has entered into the control villages which would endanger the family structure.

Changes in the Function of the Families

The mining activities in the affected villages have affected both the structure and function of the family. From the table no 3.1, it is clear that the joint families are disintegrating after mining interventions in the affected areas. The children in the nuclear family have to grow in a comparatively much smaller social set up. There are not many kin to look after the child. Children of various nuclear families now do not have peers from their own family and now the peer has to be selected from outside the family which affects the emotional attachment of the children with their family. The socialization process of a child has been disturbed. The traditional joint family of the affected villages, which once contributed to the physical, emotional and psychological security, has disappeared. Landless family members are working in the mines as a wage labour far away from their house, which raises the question for social security for the women and children.

Villagers reveal that before the advent of mining activities, members of joint family were working together in the agriculture field and cooperated with each other at the time of calamities and disasters such as drought, cyclone, flood etc. In the traditional joint family set up the women were confined to the private sphere only. They were only involved in the domestic and household work. But the status of women varied in different caste groups. Among the lower castes like *Pana, Dhoba* and *Kumbhar* the females in the village performed both farm work and household activities. The caste hierarchy and emerging concepts of status and wealth are the

controlling factors of the women's status. The affluent families and higher castes don't allow their female members to work in the field. They are very much cautious of their caste status. Female prior to the start of mining activities worked in the agriculture fields and performed various activities such as collecting water, helping the males during harvesting are now confined in the household works.

The interaction with some higher caste villagers revealed that the breakdown of joint family among the higher castes brings a great loss to them. The land is considered as the main source of the political power and social prestige. Through the acquisition of lands, the higher caste families maintain their power in the village. But with the rise of individualization among the family members the land holdings are divided. And this fragmentation of land holding is the root cause of their loss of power in the village.

Change in the Intra and Inter Family Relation

The intervention of mining activities in the affected villages has influenced villagers inter and intra family relations. The introduction of money economy, economic progress of the village has resulted in the change in attitude of the people. The contribution of the relatives and kins in the village has changed drastically. Any ritual and ceremony in the village were celebrated with the help of the relatives and neighbours. They had immense social capital to depend upon for conducting marriages, birth and death rituals and other festivals. This provided the villages with a social and economic security to face any kind of uneven circumstances. The mining activities in the villages have transformed the family relationships in the villages. The traditional (joint) family in India was organized around the important relationships between parents and children, husband and wife and siblings. Relationship between father and son in the traditional family was based more upon respect and fear than only on affection. Power and authority in the traditional family was based upon generation, sex and relative age, and it was vested principally on males. The patriarchy was virtually all powerful. It was man who decided the type of education to be imparted to children, the professions they had to take to, and even the selection of mates for them. He was not obliged to consult the young children on any issues. But in contemporary period, due to modernization, empowerment, education, a lot of change has occurred in the intra family relation. The authority is shifting from the patriarchy to the father of the children, who consult their youngsters regarding important issues to take any decision. Most of the time,

younger males are involved in purchasing items especially electronic items. The family head prefers the ideas of the younger people, since they are more concerned and aware of modern consumable items.

The marriage relationship in traditional families was dominated by the husband. Wife was considered to be an outsider. The emergence of women education and intrusion of media and televisions has influenced the age-old relationship between husband and wife. When the interrogation was held with some of the housewives in the affected villages they said that they are involved in the decision- making of the house. Their voice is not suppressed. Decisions about entertaining guests, special occasions and religious observances are very often taken by women. Higher literacy and growing number of educated male and female villagers has resulted in a more liberal outlook and equal involvement of both the genders in decision making regarding their children's education. The emergence of nuclear family has brought closeness between husband and wife. The husband is no more suspicious of his wife. In the traditional family, wife was utterly dependant on her husband for her own support and the support of her children. But now, husband no longer regards his wife is inferior to him. The introduction of mining activities in the affected villages has enhance the economic condition of the villagers, has empowered the women for decision-making. In some affairs, especially in economic matters, the traditional role of family head is still in practice, whereas participation and involvement of kin in matters of health, education and social occasion is gradually decreasing, showing development of individualism in the village.

Impact on Rural Political Structure

Political institution plays a very vital role in rural areas to determine the head of the village around whom all the power would be centred. It is the rural political institution which is very much instrumental in the distribution of power among different castes in the villages. The social order in the village is maintained through power and authority. In the rural villages land is the main source of power. The landholder who is having the ownership of large patches of land controlled the land less people. Max Weber defined power as "the probability that an actor (individual or group) has within a social relationship in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests" (Bendix, 1960).

Traditionally, this power revolved around the land in rural India. Beidelman, while working on the Jajmani system, mentioned that land, which is the prime determinant of Jajmani system, is also considered as the main source of power (Beidelman, 1959). Land is the prime source of socio political status and power (Beteille, 1965:204,Sarkar 1971:297). It is observed that the landholders not only maintain a better standard of living but also exercise direct control over the landless (ibid: 119, Rudra 1978:999, Sivakumar 1978:766). Political power and economic hegemony in Indian villages revolve around land ownership. Traditionally, the landlords belong to the higher jati. Bandopadhyay and Eschen in their study "*Agricultural failure: caste, class, and power in rural West Bengal*", reveals, "Power tends to be very closely associated with class and caste. That is those who feel they have power are generally both wealthy and belong to upper caste" (Gupta 1996).

During the field investigation in the mining affected areas it was noticed that the higher caste villagers owned a considerable amount of land and therefore the power and authority was vested in their hands. Their voices were supreme in all affairs of the villages. The economic opportunities were first utilized by the higher caste villagers who had large patches of land. They used to take all the political decisions in the village. Patrons from the dominant caste can secure a large number of followers than patrons from non-dominant castes. The rural patrons were vote banks for the politicians and, during elections, they were mobilized for votes. In return, patron expected favours such as loans for machine, buses and seats in medical and technological colleges for their kinsfolk. Disputes were referred to the patrons for settlement.

But after the intervention of mining activities in the affected villages a new context has emerged out. Land is not the prime source of power as all the agricultural land has been occupied by the MCL for mining operation. Villagers have now entered into non-agricultural professions. With the introduction of money economy and blend of modernization brought by mining in the village, a few groups of people are now controlling the affairs of the village. A new contractor class has emerged who are seen using their power in the village. The contractors are having proximity with the MCL authorities and therefore it was observed that a large number of landless villagers are seen running behind the contractors for getting non-agricultural occupations. The contractors are also seen as a vote bank as they are having a large number of people under their control. They are also favoured by the MCL because the contractor class is having a numerical

preponderance in the village which helps the MCL in getting some of their projects implemented with the support of the villagers and also it provides casual labour to MCL. Villagers report that at the time of panchayat and general elections the contractor class people are seen wooed by different political parties as they are the numerical strength in the villages and also having political connections outside of the villages. Therefore in the contemporary times the particular jati who used to control the affairs of the village is not relevance and indeed the political power is in the hands of few elite classes.

MINING AND SOCIAL CONFLICT

Mining has brought about economic gain in the affected villages through local job creation, but along with the economic gain there are certain accompanying social changes that have led to social conflicts. The causes of social conflict include lack of sufficient consultation and community engagement, lack of accurate information on mining impacts, differing expectations of social and economic benefits, environmental concerns, disputes over land use and economic compensation, migration to mining areas, and differing acceptance of large-scale mining. Since mining operations affect nearby communities socially, economically, and environmentally, communities expect to participate in decision-making and to share in the benefits of mining. It is therefore important to take these expectations into account and to address the concerns of local communities as early as possible. If community concerns are incorporated into mining projects (e.g., to prevent, control, and reduce environmental impacts) and if local communities see that they are receiving a fair share of benefits (e.g., through ample employment opportunities, construction of public infrastructure, CSR programmes, etc.), then local communities are more likely to welcome mining projects.

But during field investigation in one of the affected village Hensmul, it was reported by the local villagers that MCL has created fractions in the village. MCL by paying ransom to some of the villagers in Hensmul has brainwashed their mind and the same villagers in return have vacated their agricultural as well as their homestead land. It was observed that few villagers didn't want to speak against MCL and therefore didn't give their household data. This situation has created fraction and groupism among the villagers where one group is constantly wooed by the MCL whereas the other group is not at all ready to compromise. The villagers also blame the local

administration for supporting MCL and undermining the emotions of the local inhabitants. Villagers exclaimed that high rank officers often come to their village along with the MCL authorities and constantly try to woo them. Villagers also reported of some kind of nexus between the MCL authorities and the administration and as the villagers didn't vacate their land the PSU terminated the job of more than 126 employees as a disciplinary measure and still the conflict is continuing. This step was taken as per the recommendations of the Monitoring-cum-Coordination Committee in Coal Mines chaired by the Chief Secretary, Odisha, a company spokesperson told PTI.

Disciplinary action against erring employees also becomes a necessity so that the honest people in the service should never feel cheated," the spokesperson said. Mahanadi Coalfields is the youngest, but the second highest coal producing subsidiary of Coal India. About 60 % of its production comes from the mines in the Talcher Coalfields, the largest coalfields in India. "Any obstruction in mining activity causes huge loss to the nation," he said, adding that the extreme step was undertaken as a disciplinary measure as workers were not ready to vacate the land despite repeated persuasions and several rounds of meetings. "The employees had not vacated their houses, in the coal bearing areas acquired by the company, against which they have taken all R&R benefits, including employment in the company as well as monetary compensation and a piece of land to construct house at the R&R site in nearby area," the spokesperson said. Out of these terminated 126 employees, 71 employees had also taken possession of company quarters (PTI, May 22, 2014).

The clash between the villagers and the authorities of MCL are not yet resolved and therefore tension continues to culminate day by day. As the MCL refused to call off the termination of 127 villagers of Hensmul, the agitated villagers on 26th June paralyzed Ananta and Bhubaneswari coalmines at Talcher demanding either reinstating them or returning the agricultural land acquired by the company for mining. The two coalmines together produced nearly one lakh tonne of coal and dispatched same amount of coal per day. Insinuating the MCL responsible for these losses, a village leader Parsuram Sahu said that they stage dharna and shut down the mines due to anti-villagers approach of the company which stuck to its stand to shift from village without providing alternative land to resettle.

The villagers were on tenterhooks as they do not have their own land and neither the MCL officials are providing land for them. They have lost all their land to the coal mines. All talks failed and even a letter by Odisha Mines Minister Prafulla Mallick to MCL chief to reinstate the termination order yielded no result. MCL in a press release said that the strike by villagers is uncalled, unjustified and it would hamper coal supply to the power sector in the nation. Most disappointing point is that none of the elected representatives are trying to solve the issues in the village. Therefore, it is quite essential to establish a good relationship between governments, large-scale mining companies, and local communities at the earliest stages of mining projects. This is significant in the countries that have a history of colonialism, such as India where government has neglected local communities and indigenous people, and where the distrust of government or other groups in society are common. Local communities may also oppose mining operations if they perceive that projects have been imposed on them without sufficient consultation. The villagers also reported of some of the villagers joining hands with the MCL authorities and are continuously trying to break the unity, harmony in the villages due to which there is widespread resentment.

IMPACT ON THE CASTE SYSTEM

Caste system played a crucial role in determining the social and economic status in the rural areas. Many castes are traditionally associated with an occupation, such as high-ranking Brahmins; middle-ranking farmers and artisan groups such as potters, barbers, and carpenters; and very low-ranking castes like leatherworkers, butchers, launderers, and menial workers. There is a correlation between ritual rank on the caste hierarchy and economic prosperity. Members of higher-ranking castes tend to be more prosperous than members of lower-ranking castes. Many lower-caste people live in conditions of great poverty and social disadvantage. This was the picture of the rural villages in the pre-mining period, but now the situation has undergone changes. Villagers in the affected villages are no longer continuing the traditional occupation which was associated with their caste. For instance, the *Kumbhar* caste who earlier worked as potters are now not performing the same duties, they have started working as a wage labour in the coal mining activities as it fetches them more money than they earned from their traditional occupation.

Prior to mining activities in the affected villages, the relationship among the villagers was based on caste. A caste group was confined to the same in-group and avoided any out-group relationships. But with the entry of mining activities in the villages the concept of class has made its way into the villages. Mining activities in the villages have had a far-reaching effect on caste practices, in the affected villages. The money economy has made the villagers forget the principle of purity and pollution and caste endogamy. Access to employment often occurs through inter-caste connections. Restrictions on interactions with other castes have become more relaxed, and, at the same time, observance of other pollution rules is declining; especially those concerning birth, death, and menstruation. The correlation of caste with occupation has declined to a great extent. Higher salaries, better standard of living has resulted in the formation of class relation in the mining affected villages. For instance, the lower and higher caste groups share the same occupational platform, thus belong the same class. On further investigation it came to light that the higher *jati* (Brahmin,Kshatriyas), who were playing a dominant role in the village, have lost their traditional dominance. Air of class like interests has indeed disturbed the age-old equilibrium of the *jati* group to a greater extent. The members of the village committee often favour those who belong to their class rather than to their *jati*. Therefore it is obvious that class relations are replacing the caste relations after intrusion of mining activities in the villages.

IMPACT ON VILLAGE FESTIVALS AND RITUALS

In rural India agriculture is still the mainstay of the economy and primary source of livelihood. There is a historical linkage between agriculture and rituals and this connection was observed in the affected villages that we choose for the study. Agriculture in these villages was not merely construed as means of livelihood but also a way of living. However the mining activities in the affected villages have brought concomitant changes in the traditional agro-based cultures. Since ancient times in rural India, religion has a deep influence over man's thoughts. It has been regarded as the product of civilization until Tylor (1871) gave a convincing proof that 'primitive' societies had their own version of religious activities, not very different from that of the 'civilized' societies. Basically in the rural societies, people believe that the process of nature and the success of human endeavour are under the control of entities outside the range of everyday experience, whose intervention can change the course of events. In order to seek the blessings of

these entities, human beings have developed and consolidated their faith in different gods and goddesses and have set aside certain days or periods of time for ritual celebrations.

Picture 3.1: Place for religious belief

During the field investigation a number of agro-based festivals were reported in the villages. From the advent of sowing to the ripening of crops and harvesting, different rituals were celebrated in the villages. Ritual observances for the propitiation of deities at the time of seasonal renewals were primarily to ward off the evil influences caused by cyclic changes of nature. The food grains harvested seasonally was offered symbolically to the Gram Devi through various harvesting festivals. As villagers used to entirely depend upon monsoon as the source of water for their crops there were numbers of rituals performed in order to appease the God *Indra* and the villagers performed several yagya for the same. Different type of festivals such as *Halasutra, Aghira-Purnami,Akshya-Trutiya, Rajja, Chitou-Amabasya, Puruni, Dussehra, Holi* were celebrated with full spirit and enthusiasm but now the story is something different. Satpathy (1996) emphasizing on the belief systems, has mentioned that the villagers in Odisha used to worship the goddess *Durga* as *Sakambari,* who saves them from drought and famine providing abundant crops. Citing many different secondary and primary sources, Mishra (2008) reveals that the villagers have even structured the hierarchy among the gods and goddesses considering different roles played by them in agriculture, which reinforces the views regarding the nexus

between agriculture and religious beliefs and practices in rural Orissa.

After the intervention of coal mining in the affected villages, agriculture is no more done in the villages which have rendered the agro-based festivals to extinct. Mining activities have completely subjugated the festivals and rituals which were practiced in the villages before mining. Each and every family in the village collectively celebrated certain festivals with joy and serenity but the picture has completely changed in due course of time.

Table No. 3.2: Impact of Mining on the Observance of Rituals and Festivals

Impact on Rituals	Type of Village	
	Affected Village	**Control Village**
1. Performance of Rituals		
Prevalent	73(16.23)	107(71.33)
Declining	377(83.77)	43(28.67)
Total	450	150
	2.Spirit behind Observing Rituals	
Prevalent	39(8.67)	124(82.66)
Declining	411(91.33)	26(17.34)
Total	450	150

Source: Field Survey

From the above table no. 3.2, it is evident that 16.22% of the mere population in the affected villages celebrates the agro-based and other village level festivals. While the rest 83.77% of the villagers in the affected villagers stated that they do not celebrate the festivals in the present context after the mining intervention. In the control village, the scene was quite different. During the interaction with the villagers around 71.33% of the villagers still continue to observe different agro based and household festivals where as 28.66% reported otherwise. On further interaction with the villagers they exclaimed that the spirit in celebrating different household and village level festival is not the same. Around 91.33% of the villagers in the affected villages reported that they do not observe the festivals and rituals with the same spirit which they used to

observe before mining but in the control villages the spirit and uniformity in observing different household and village level festivals and rituals is still intact.

The present study indicates that mining activities has influenced the age-old tradition of observing different festivals. Introduction of monetary economy has made the people busy throughout the year. It has naturally disturbed their traditional work cycle, which in turn has gradually reduced the importance of different festivals in the village. Although the celebration of some festivals is still continuing in the study villages but it has lost its significance in agricultural operations. It was observed that most of the rituals which were basically attached with paddy seeds and saplings(for example, ploughs) like *Halasutra* and *Gahma Purnami* have become extinct. Though some of the rituals and festivals are still going on, they are not celebrated with the same fun and frolic. The mode of operation of socio-religious rites and ceremonies has changed. Those people who are still observing them, are not celebrating these rituals in a way prescribed and practiced before. Most of the villagers are not aware about the significance of these rituals. They are celebrating these rituals just as a traditional and generational obligation. It is also observed that the disappearance of bullock-carts, ploughs and other agricultural implements and accessories has resulted in the disappearance of the plough and cart songs from the village. Thus the disappearance of some rituals and lessening of the importance of certain others have created a situation of unpredictability regarding the sustainability of few festivals which still continue in the villages.

Impact on Jajmani Relation

In the rural villages Jajmani relationship is seen as a patron-client relationship, in which the relationship is between the patrons who belong to a higher caste and the clients who belong to a lower caste. In the Jajmani system of production and distribution, there are the high castes which are referred as *Jajmans* and the lower castes which are referred as *Kamins*. It is the duty of the lower castes to absorb pollution by handling things defiled by birth or death pollution, and perform other duties, such as gathering up banquet dishes after feasts and administering various bodily attentions to a new mother, bride, or groom. It is normally assumed in anthropological literature that Jajmani system is defined by relationships between land owing Patron and Client households (Fuller, 1989). Beidelman correctly noted that caste duties and land holding are the

bases of these relationships. The essence of Jajmani system lies in the exchange of grain and other materials benefits for economic and ritual services (Beidelman, 1959). Jajmani is conceived as a "system of distribution in Indian villages where by high caste land owning families called Jajmans are provided services and products by various lower castes such as Carpenters, Potters, Blacksmiths, Water carriers, Sweepers and Laundrymen. Purely ritual service may be provided by Brahman priests and various sectarian castes and almost all servicing castes have ceremonial and ritual duties at their Jajman's birth, marriage, funerals and at some of the religious festivals" (Kolenda, 1963:11). The above views given by different authors indicate that Jajmani relation is primarily based upon the land without land it is very difficult to think about the Jajmani system.

During the field visit it was found that Jajmani system in the village includes three distinct types of relations: (i) Landlord and the priests, (ii) Landlord and service providing castes (iii) Landlord and agricultural labourers. Villagers exclaimed that earlier the Purohit used to visit the house of the landlord and performed certain rituals for which he received prestations such as Dana, Dakshina and Barshika. If the landlords didn't give the Dakshina it was believed that the rituals performed would not produce any fruits. In the second type of jajmani relationship there was a service jati. On the basis of the relationship of landlords, the servicing jati of the village can be divided into two groups. The first group consists of such jati with whom the landlords had permanent Bartan relation (Barika, Dhoba, Kamar, Badhei). The second group consists of all other service jati such as potter and goldsmith, whose services were not in regular demand and had no hereditary relationship with the landlords. The latter were not rewarded annually, but rather on the occasions, when their services were required. Similar observation was made by Pocock (1963), in his study on Jajmani relation, where he had divided the service Jati into two groups. The group 1 covers those who provide service (Barber and Washer man) and the group covers those who provide commodity (Potter and Goldsmith). The third type of relationship was between landlords of the village and the agricultural labourer. The agricultural labourer was basically from the scheduled caste and the relation was based on non-ritual services. The labourers were known as Halia. They used to stay in the landlords house and performed various kind of agricultural works and in turn received clothes, food to eat, a patch of land etc.

After the intervention of mining operations in the area agriculture is not practiced as an occupation and the large patches of land have been taken by the MCL which has altered the concept of Jajmani relation in the affected villages. The old age concept of Jajmani system is an agro-based rural social institution. So, any change in agricultural practice will undoubtedly bring alteration in this relation and the same has occurred in the affected villages.

Table No. 3.3: Impact on Jajmani System

Type of village	Not Prevailing	Prevailing	Total
Affected village	435(96.6%)	15(3.33%)	450
Control village	52(34.66)	98(65.33%)	150

Source: Field Survey

The above Table no 3.3 shows that around 96.6% of the villagers in the affected village claim that Jajmani system has recorded a deviation and there is alteration in the traditional system of Jajmani where as mere 3.3% reported otherwise. On the other hand in the control village around 34.66% of the villagers claimed that there has emerged a change in the traditional Jajmani system but 65.33 % of the villagers claimed otherwise. In the affected village around 65.8% of the villagers exclaimed it is the mining activities that have led to the expansion of market economy resulting in the change in the traditional Jajmani relation. While in the control villages, villagers reported of some other factors such as mechanization of agriculture, modernization which is altering the Jajmani relation.

The advent of mining has a tremendous impact on traditional landlord-Purohit, landlord-service jati and landlord-agricultural labour relations. In the affected villages the purohits are not getting *barsika* i.e the annual prestation from their Jajman's house. Still, they are visiting the landlords at the time of life cycle rituals, for which, they are receiving payments in terms of both cash and kind. The cash demanded by the purohits is very high due to the change in the market economy and the changing economic status of the people working in the MCL mine. As all the villagers are more or less buying race from the market for their day to day consumption they are not showing interest to give the payment in terms of paddy or rice. The service jati people such as *Barika* (Barber) are still continuing to serve the villagers in the affected village. The *Barika* also

visits the house of the people at the time of rituals but the money demanded by the *Barika* has also increased. Earlier Jajmans also used to give grains to the service jati people but the concept of giving food grains in the affected village has become extinct. Owing to the advent of mining in the affected villages, drastic changes have taken place in the relation between landlord and agricultural labourers. The labourers do not work in the agricultural fields as there is no agricultural land but work as a wage labour in the coal mines. Earlier, these local labourers were working in the field of landlords with a spirit of Jajman*i* relation. The farmers often provided them food and payment in kind. But due to break up of the traditional relationships the labourers work in the house of the people only during the time of construction and renovation of the house for which they get cash in return. Thus it can be argued that the Jajmani system still exists in its core; however the content of it has changed.

4. COAL MINING AND RURAL LIVELIHOOD

Mining is regarded as one of the vital economic activity in almost all the developing countries including India. Activities, that can either be small or large scale, are ultimately harmful both for the society and environment (MMSD, 2002). Though there are positive impacts of mining, but with we are bound to embrace the negative deteriorations like displacement, improper rehabilitation measures, inadequate and extravagant occupational practices, breakdown of social ties and recurrent features of contaminated atmosphere. Besides these, mining also has some direct impacts on the local communities and their livelihoods. Though the operation necessitates infinite extent of dynamic domains, at first it displaces the local communities from their own land which eventually grounds a sheer modification on their usual pattern of life and livelihoods. The emission of coal dusts and waste particles, wagons of waste waters, noise of blasting and improper conveyance are intrinsically offensive for the deterioration of their natural environment. On the other hand, the benefit goes directly to the bourgeois class and others remain as the victims of these so called development process.

The philosophies of development turn out to be a challenge, unless and until it secures the livelihood of project affected peoples. Although transformation is necessary to fortify the country, still it should not harm the livelihood of uncountable mass in its fold of movement. The first and foremost duty of the development authorities is to safeguard the livelihood in a sustainable way. Livelihood encompasses the capitals which necessitate the capabilities, assets and activities for the proliferation of a means of living. It can be sustainable when it deals with the stress and shocks as well as delivers the livelihood prospects for the imminent cohorts (Chambers and Conway, 1992).

Livelihood itself is a broader characteristic. So a framework is necessary to confine it into a definite element. In the present study the livelihood framework developed by United Kingdom's Department for International Development (DFID) is being analysed. This framework was developed to assess the different factors affecting livelihoods. Generally this scheme ensures its significance in the agriculture and rural livelihood projects (Mishra, 2009). Though the present

study was undertaken in a rural setup, it laid the importance on analysing the changing livelihood pattern by employing the approaches developed by DFID.

The impact of coal mining in the Talcher region is manifold. Though it is trying to be society friendly by generating employment opportunities, developed new and well-connected roads, urbanizing the community by establishing community centres and school building, provided electricity, still the negative impacts in form of degradation of environment and biodiversity, air, water and noise pollution, deterioration of health etc. cannot be unnoticed. The infrastructural development is of no use while the environment and biodiversity is degrading. So as the material happiness is valueless without good health. So a detailed analysis was made by borrowing the livelihood approach of DFID.

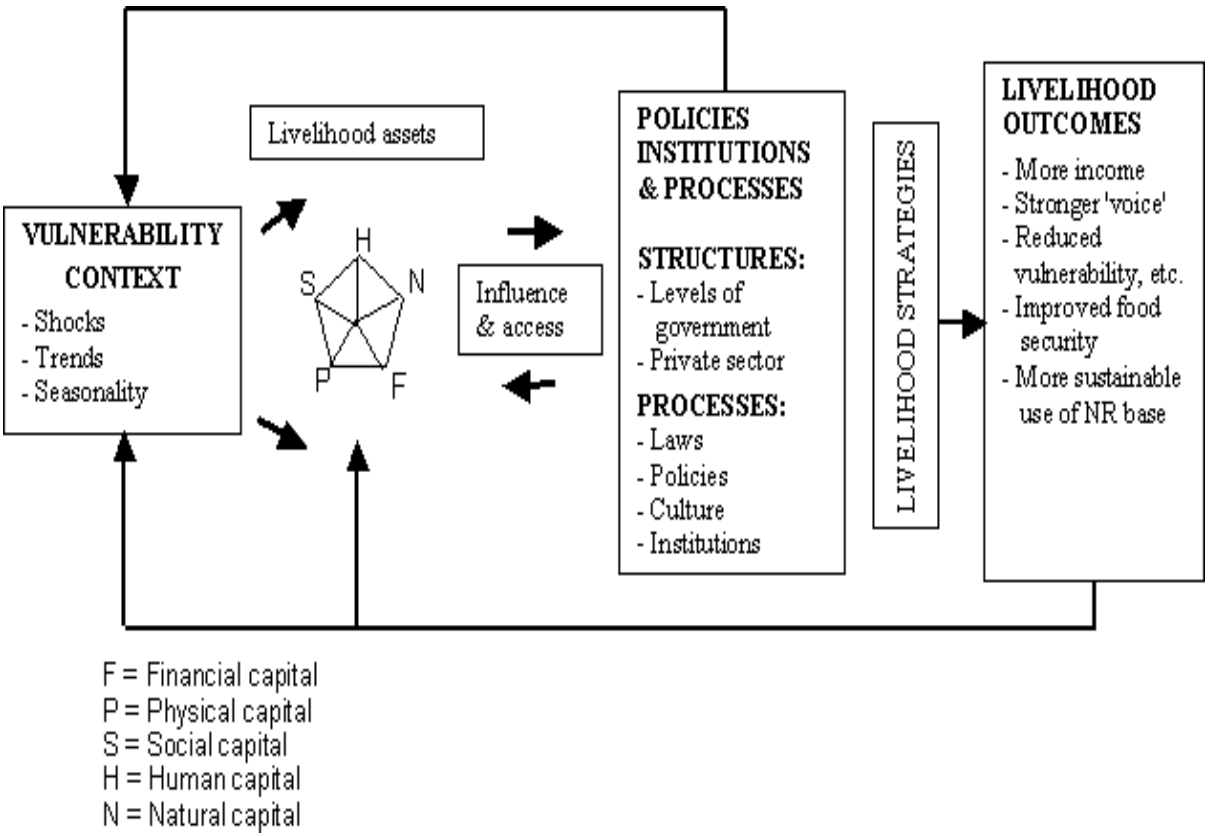
SUSTAINABLE LIVELIHOOD FRAMEWORK BY DFID

The model of 'Sustainable Livelihoods' was developed by diversified development agencies. But the approach developed by DFID is extensively popular in the preparation of development agendas. The DFID has accustomed the definition of 'Sustainable Livelihood Framework' (SLF) which was developed by Chambers and Conway. According to this "A livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base"(DFID, 2000). The SL approach justified that, under this framework the people should follow a series of livelihood merchandises which in turn help them to preserve resources and condense their liability.

Though the approach was developed to abbreviate poverty, henceforth it signifies its base with the vulnerability context, which structures the outward atmosphere of the populace. In the vulnerability context there are three components i.e. shock, trend and seasonality which has a direct impact (positive/negative) on livelihood assets. In the present study the major focus was on the mining affected villages, so the varieties of commercial deeds were analysed instead of vulnerability. In the experimental villages mining has a direct impact on the usual economy of the residents and this in turn is influencing their livelihood assets. So the impact on livelihood

assets were analysed on five phases by employing five core capitals of the SL framework. While these assets influence the policies, institutions and processes, on the other hand it helps to embrace diverse livelihood strategies which aids in building varied livelihood outcomes.

Figure 4.1: Sustainable Livelihood Framework by DFID



Source: DFID's Sustainable Livelihoods Guidance Sheets

This SL approach encompasses five types of core capitals which are needed for a sustainable livelihood i.e. human, social, natural, physical and financial capital. ***Human Capital*** embodies the skills, knowledge, ability and good health that enable people to pursue different livelihood strategies and achieve their livelihood objectives. ***Natural Capital*** is the term used for the natural resource stocks from which resource flows and services useful for livelihoods are derived (e.g. land, forest, water, air quality, wild resources etc.). ***Physical Capital*** comprises the basic infrastructure and producer goods needed to support livelihoods. ***Financial Capital*** indicates the financial resources that people use to achieve their livelihood objectives. The concept of ***Social Capital*** is still debatable. However in the context of the sustainable livelihoods framework it has

been regarded as the social resources upon which people draw in pursuit of their livelihood objectives (DFID 1999).

MINING AND RURAL LIVELIHOODS

Until the introduction of mining projects the entire occupational scenario of the mining affected villages was agro-based. All most all the villages both directly and indirectly were depending on agriculture for their survival. The forest resources were also another major source of income for them. It has been reported that the households in both the experimental and control regions were used to collect forest based products for their day to day consumption. With the introduction of mining projects, the pattern of livelihoods has changed. Agriculture which was a major source of livelihood is being replaced by non-farm activities. Prior to mining the non-farm activities were not abundantly available but mining has introduced diversified source of livelihoods. In this context a detailed analysis on the impact of mining on rural livelihoods was made by employing following five types of capital.

Impact on Human Capital

As discussed earlier in the SL framework human capital refers to the skills, knowledge, ability to labour and good health which jointly empowers the people to develop dissimilar livelihood policies and for the attainment of livelihood objectives (ibid, 2000).

Mining has broadened the path for employment and so also raised the standard of living. But it is not instrumental to look into the health aspects of the mining affected communities. No doubt it has built hospital to check the health condition of the mass but this facility is only limited to the working communities of MCL and no such provision was made for the non-employees. The major health problems encountered by the residents over there are varieties of skin diseases, fever including malaria, gastritis, asthma, gynaecological problems and TB. Eye allergy and eye irritation are also the frequently occurring diseases over there.

Table No. 4.1: Major Health Problems in Talcher Coalfield

Villages	No of HHs Affected	Major Problems
Mining villages	422 (93.78)	Skin disease, TB, Fever, arthritis, asthma, gastritis, eye-allergy
Control Villages	115 (76.67)	Normal fever

Source: Field Study

All the mining affected villages were reported to be passing through various health problems and when contacted with the doctors they replied that mining has some impact. The emission of coal dust as well as the radiation of heat is causing incurable skin diseases all over the body. It is clear from the above table (no. 4.1) that residents of all mining affected villages are frequently encountering several health problems and the non-employees are facing problems as they were not entitled to avail the free medical facility. They are paying money for medical check-ups and also are purchasing the medicines. But having lower income are still striving to come across the medical cost and sometimes dying as they cannot meet the expense of the medicinal expenditures. The table number 5.8 reveals that around 81% households in mining affected villages are spending more than 5000 rupees per annum for their medical expenses. The interaction with elder people reveals that mining pollution has reduced their capacity and capability to work. Work after the age of post fifty has become a real challenge for them. Even some of the MCL employees said that they were forced to hand over their job to their wives because of health problems due to inhalation of polluted air continuously. However, things are quite different. As per the MCL authorities as they cannot recruit those women in mining, their husbands are leaving the job giving it to their respective wives. It is becoming a burden for MCL as they are recruited in office only. On the other hand, the control villages were reported very less health issues. In the Deraguda village, only 33 percent, and in the Saradhapur village, only 43 percent of the households have encountered some sort of health complications during the last two year. In the control villages most of the households reported that sometimes they are suffering only from normal fever and cold.

Besides good health education is an important factor for any individual as it decreases ignorance and improves the morality towards unscrupulous circumstances. But aspect has been largely neglected in the mining affected villages. MCL acts as passive factor in the context of education. Even it has not given any attention towards the attainment of primary education which is a common allowance for all.

It is clear from the table no. 2.13 that in the mining affected villages 29.3 percent populace are literate and 18.6 percent populace are illiterate. While the illiteracy rate is same in case of control villages, but the literacy rate is somewhat less i.e. 26 percent in compare to mining affected villages. Similarly in case of control villages, the household heads are more prone towards primary and middle level of education. Whereas, 15.1 percent household heads of mining affected villages were reportedly attended matriculation 5.1 percent were having intermediate degree, followed by 2.8 percent were having the qualification of graduation or above. Then again the representation of control villages in intermediate and graduation level is 2.7 percent and .7 percent respectively. However the economically well-off mass of mining villages is at some point availing some professional qualifications and this factor is absolutely inattentive in case of control villages. Though we had an assumption that the rise of income in mining affected villages may encourage people to go for higher education but things are quite different. From the very beginning villagers became money minded and they start searching easy way for earning money rather than to became well established educationally. Some feels having some professional education like ITI can meet their requirement of getting a job in MCL. And that is ultimatum and great achievement for them.

With the intervention of mining activities local people have lost their traditional occupation with which they were acquainted since ages. Though promises were made by the MCL officials for the arrangement of alternative sources of livelihood, till yet that remain in the pen and paper only. No such type of intervention was introduced in any of the mining affected villages. Henceforth, it is clear from the field study that mining has a sheer negative impact on human capital.

Impact on Financial Capital

Financial capital is considered as the most important of capitals, which reflects the economic status of a person in the society. Improvements in financial capital are a reflection of improvements in the employment pattern and income due to changes in source of income. Increased income from these activities or sources creates the potential for more savings and, consequently, an increase in financial capital. While during pre-mining period the major source of income was agriculture and forest resources, the source of incomes became only mining centric after the post mining period. The diversified source of income has lost its importance in post mining period. There are different means adopted for the improvement of financial capital by the respondents. The means adopted by the respondents in study areas are discussed below:

Table No.4.2: Occupational distribution of the Respondents in the sample villages

Main occupation of Household Head	Mining affected villages	Control villages
Cultivation	10 (2.2)	71(47.3)
Diary	5 (1.1)	2 (1.3)
Agricultural Labour	.....	39 (26)
Skilled wage labour	12 (2.67)	2 (1.3)
unskilled non-farm wage Labour	156 (34.67)	28 (18.67)
Service- Private Sector	22 (4.89)	5 (3.3)
Service-Government Sector	227 (50.4)	3 (2)
Trade/Business from fixed Premises	18 (4)	--------
Total	450(100)	150 (100)

Source: Field Study

Note: Figures in the parenthesis are percentage.

The table drawn above (Table no. 4.2) shows that in the mining affected villages, majority of the respondents (50.4%) were expressed their liability to have their earning from the government sectors. And in the mining set-up it refers to have employment in MCL. They are being provided job against their homestead and cultivated land. But the scenario in control villages is totally different. Here only 2 percent respondents are working in Government sectors. Agriculture which was the main source of income during pre-mining period has lost its importance after mining. Data collected from field shows that while 47.3 percent respondents in control villages are depending on cultivation as a primary source of their livelihoods, it is only 2.2 percent in case of mining affected villages. Agricultural labour is another occupational activity in control

villages. While around 26 percent respondents are engaged as agricultural labourers in control villages, it is totally absent in case mining affected villages. The introduction of mining both directly and indirectly has discouraged agricultural activities. There are various reasons for this reduction in agricultural activities in the mining villages.

First of all, most of the households in mining affected villages lost their agricultural land due to mining, so the dependency on agriculture has drastically changed. Secondly, since employment in the mines make available a safe source of monthly income, so the villagers are not putting any interest to engage themselves in any type of agricultural activities. Thirdly, agriculture is very uncertain in this area. There are no irrigation facilities in the villages, so agriculture is seasonal and the production entirely depends on rainfall. According to the villagers, with the starting of mines, scarcity of agricultural labour is widely experienced. Since the wage rate for day labour in mines is higher than that of agricultural labour, people prefer to work as daily labourers in mines even during the agricultural seasons. Few villagers claimed that the mining induced pollution has reduced the productive capacity of the land. In case of control villages a sheer contradictory scene was observed. Here, all most all the households were depended on agriculture. In other words agriculture is their primary source of occupation and once the agricultural season is over they used to engage themselves in forest based activities.

A shift in source of livelihood is observed in case of mining affected villages. Around 34.67 percent respondents who are working as unskilled non-farm wage labourers claimed that they used to work as agricultural labourer in pre mining period. As agriculture is uncertain and also does not provide sufficient income, the villagers have to find out other sources of livelihoods and the next option is to work in non-farm sector as daily wage labour. Though respondents in control villages are ready to work as casual labour, the lack of job opportunities in their locality has confined themselves in farm sectors.

Though, trade and commerce is not an important source of income in any of the sample villages, the percentage of households depending on this sector is more in the mining affected villages (4 percent) than the control villages. It is all most nil in control villages. This is because the introduction of mining has created opportunity for lots of outsiders to come to this locality which developed a market opportunity. The assured source of income from mining sector has increased the purchasing and investing capacity of the villagers. There are different types of business in the

mining villages. While some rent out their tractors and vans, some run hotels, *pan* shops, grocery shops and cycle repair shops, and some are engaged in the vegetable business. Some households in the mining villages indulge in income-generating activities such as drivers, helpers in tractors, tailors, blacksmiths, barbers, contractors, etc. During field work in mining affected villages it was observed that the respondents have developed a tendency to go for professional education as it will give them some opportunities in non-farm sectors.

Livestock which was another source of income for villagers has lost its relevance in the mining affected villages. The loss of grazing lands due to mining operation has discouraged most of the households to keep livestock. Even the environmental pollution which has become a major threat to the life of livestock has discouraged the villagers to keep livestock with them. The detail is discussed in chapter 5. However, in control villages good number of households is keeping livestock with them as they are still depending on agriculture as major source of income.

Though the diversified sources of occupation have lost its importance in the mining affected villages, still up to some point the financial condition is quiet better than the residents of control villagers. It directly signifies that mining has a positive impact on financial capital. Table 3.4 displays the percentage of households below poverty line (BPL) and above poverty line (APL) in both the mining and control villages.

Table No. 4.3: Households below Poverty Line

Types of HH	Mining village	Control village
BPL HHs	82 (18.22)	37 (24.67)
APL HHs	368 (81.78)	113 (75.33)
Total HHs	450 (100)	150 (100)

Source: Field Study
Note: Figures in parenthesis are percentage.

It is clear from the above table (no.4.3) that the percentage of BPL households is comparatively higher in the control villages. In the mining villages most of the household have job and also they are staying in the MCL quarters.

Displacement from the agro-based livelihoods cliques the pillar of impoverishment. It intensely put down the foundation of hardship for the project affected people. Traditionally the rural mass is entirely dependent upon the agro and forest based livelihoods. These sources were their prime means of income till the intervention of mining activities. As it is acceptable that the loss of physical assets can be recovered but the loss of traditional income sources is difficult to improve. According to the provision of MCL, one member of each entitled family is getting a specified a job in the mines under compensation process. Other members of family are not getting any occupational opportunity by MCL. So there occurs discontentment among the family members. According to Resettlement and Rehabilitation Policy of 1989, MCL has provided employment under the following categories:

- One member from the family sustaining loss of dwelling houses, homestead land and agricultural lands not less than 1/3rd of the total holding shall be provided with employment on a priority basis.
- One member of each family having sustained loss of 3 acre of non-irrigated land or 2 acres of irrigated land shall be provided with employment on second priority.
- In case of families having lost only homestead land or the total agricultural holding, one member from each family shall be provided with employment according to availability.
- In case of families who have lost 1/3rd of the total agricultural holding, one member from each shall be provided with employment accordingly to availability.

Though the R & R Policy is undergoing many changes to be people friendly, still the basic idea is more or less same.

Table No.4.4: Employment to land oustees provided in MCL since inception

Name of Area	Job offered before 1992 (before imple-mentation of 1989 policy)	Job offered from 1992 to Feb. 2014				Sub total	March 2014				Sub total	Job offered from 1992 to March 2014				Sub total	Grand Total (including job offered before 1992)
		A/(i)	B/(ii)	C	D		A/(i)	B/(ii)	C	D		A/(i)	B/(ii)	C	D		
Jagannath	540	1090	33	51	116	1290	1	0	3	0	4	1091	33	54	116	1294	1834

Kalinga	823	550	121	196	305	1172	0	0	0	0	0	550	121	196	305	1172	1995
Bharatpur	0	358	6	2	0	366	0	0	0	0	0	358	6	2	0	366	366
Lingaraj	90	1460	143	128	0	1731	0	0	5	0	5	1460	143	133	0	1736	1826
Hingula	0	1836	86	197	27	2146	68	62	0	0	130	1904	148	197	27	2276	2276
Talcher	7	36	5	8	1	50	0	0	0	0	0	36	5	8	1	50	57
Talcher Coalfield	1460	5330	394	582	449	6755	69	62	8	0	139	5399	456	590	449	6894	8354

Source: MCL Office

The above table 4.4 represents the total number of employment has provided to the land oustees since initiation. According to the official records before the implementation of 1989 policy of MCL, the total number of employment in Talcher coalfield is 1460. Again the data shows that between 1992 to Feb.2014 the total number of employment in MCL is 6755. The last column reflects that till March, 2014, MCL under all the resettlement and rehabilitation policies (1889, 1998 and 2006) has employed 8354 people in the Talcher Coalfield. However, MCL has designed some categories for employment from time to time. As per R & R Policy, 2006:

Displaced and other affected families shall be eligible for employment by the project causing displacement. For the purpose of employment, each family will nominate one member of the family. The project proponent will give preference to the nominated members of the displaced and other affected families in the matter of employment. The order of preference will be as follows.

- Displaced families losing all lands including homestead land.
- Displaced families losing more than 2/3rd of agricultural land and homestead land.
- Displaced families losing all agricultural land but not homestead land.
- Displaced families losing more than 1/3rd of land and homestead land.
- Displaced families losing only homestead land but not agricultural land.
- Families loosing agricultural land in part but not homestead land.

While execution MCL has given more priority on the first five categories and less significance to the last categories. In the context of providing employment opportunities MCL has done excellent job in providing employment to as much as affected people.

Though mining occurred with mass scale displacement, still it credited some major financial changes in the mining affected villages. It was found out that that the income level of the mining

affected villages is pretty good as maximum numbers of the individuals are working in the mining related activities and are earning good revenues. The comparison made about the income level of the households in pre mining and post mining phase, shows that before mining most of the households (46.4%) were involved in the agricultural activities so that the income level was below Rupees 30,000. Another group of people whose occupation was business, their annual earning was in the middle of Rs.30, 000-50,000 and they hold second rank in the hierarchy of annual family income. And there were only 10.9 percent whose annual income was above fifty thousand. But the annual income of the family showed a drastic change in the post mining phase. During post mining phase a vast majority of the households (47.8 %) are earning an income ranging between 1 lakh to 1.5 lakh. The second majority of the households (33.3 %) are able to make an annual income of 50,000-1 lakh rupees. Then 10.2 percent of the households are earning more than two lakh rupees in a year followed by 8.7 percent of the households whose earning is below 50,000 rupees. A detailed caste wise annual family income is being arranged in the table no. 4.5 and 4.6.

Table No.4.5: Annual Income of the Family in Pre-mining Period

Caste of the Households	Total Annual Income in pre-mining period				Total
	Below 20000	20000-30000	30000-50000	Above 50000	
General	21 (4.66)	13 (2.9)	64 (14.22)	17 (3.8)	115 (25.6)
OBC	70 (15.55)	30 (6..66)	116 (25.77)	22 (4.9)	238 (52.9)
SC	50 (11.1)	27 (6)	10 (2.2)	9 (2)	96 (21.3)
ST	0	0	0	1 (.2)	1 (.2)
Total	141 (31.31)	70 (15.56)	190 (42.19)	49 (10.9)	450 (100)

Source: Field Study

Note: Figures in parenthesis are percentage.

Table No.4.6: Annual Income of the Family in Post-mining Period

Caste of the Households	Total annual income in post-mining period				Total
	Below 50000	50000- 1 Lakh	1 Lakh- 1.5 Lakh	Above 2 Lakh	
General	7 (1.6)	23 (5.1)	68 (15.1)	17 (3.8)	115 (25.6)
OBC	24 (5.3)	85 (18.9)	106 (23.6)	23 (5.1)	238 (52.9)
SC	8 (1.8)	41 (9.1)	41 (9.1)	6 (1.3)	96 (21.3)
ST	0	1 (.2)	0	0	1 (.2)
Total	39 (8.7)	150 (33.3)	215 (47.8)	46 (10.2)	450 (100)

Source: Field Study

Note: Figures in parenthesis are percentage.

It is clear from the above tables that mining has brought a positive impact on annual family income of the mining affected households. Prior to mining the major chunk of the households were reportedly had lower income status. But after mining the vast majority of the households (47.8%) are earning an annual income between 1 lakh to 1.5 lakh. Similarly it is also evident that in the mining affected villages the General and OBC households are the dominant castes and they are earning more than the SCs and STs. More specifically the OBCs are the dominant castes in the mining affected villages and they are earning more than the others. During pre-mining phase they also dominated the scenario. However, the overall situation shows that irrespective of caste and communities all are financially benefited after the introduction of coal mining in this region. The scenario from mining affected villages shows that while around 89% households were having income less than rupees fifty thousand per annum during pre-mining period, it is only 8.7% now.

The control villages also has a resemblance with the mining affected villages i.e. the representation of OBCs are high. A detailed data on annual family income of the households of control villages are given below:

Table No.4.7: Annual Income of the Family in the Control Villages

Caste of the Households	Total Annual Family Income in the Control Villages				Total
	Below 25000	25000-50000	50000- 1 Lakh	Above 1 Lakh	
General	6 (4)	21 (14)	12 (8)	5 (3.3)	44 (29.3)
OBC	2 (1.3)	33 (22)	28 (18.7)	7 (4.7)	70 (46.7)
SC	1 (.7)	19 (12.7)	9 (6)	2 (1.3)	31 (20.7)
ST	0	5 (3.3)	0	0	5 (3.3)
Total	9 (6)	78 (52)	49 (32.7)	14 (9.3)	150 (100)

Source: Field Study

Note: Figures in parenthesis are percentage.

It is clear from the table no. 4.7 that only 6 percent of the households are earning less than 25,000 rupees in a year. While 78 percent of the households are earning between 25,000-50,000 rupees, 32.7 percent of the households are generating 50,000-1 lakh rupees followed by 9.3

percent of the households who are engendering more than one lakh rupees in a year. So a great deal of variation was perceived in the context of annual family income. And it is clearly distinguishable that mining has vertical positive waves in raising the financial capital of the mining affected communities.

Annual Expenditure

Impact on financial capital cannot be measured without expenditure. So the average annual expenditure of households was calculated. It was witnessed that, in the pre mining phase, the average annual household expenditure was relatively low than the post mining phase. Even it has some similarity with the control villages. However, in the post mining phase, from food to health, at each segment the expenditure is more (Table No. 4.8).

Table No.4.8: Annual Expenditure

Average Household Expenditure (Pre Mining)					
Items	N	Minimum	Maximum	Mean	Std. Deviation
Food	450	10000	20000	13506.67	3508.970
Education	127	500	1800	743.31	234.436
Clothing	263	500	1580	921.37	332.886
Entertainment	148	80	700	241.69	183.691
Fuel	119	200	3600	757.23	657.661
Health	450	500	2200	1190.54	382.576
Total Household Expenditure	450	22000	52000	38617.78	7504.454
Average Household Expenditure (Post Mining)					
Items	N	Minimum	Maximum	Mean	Std. Deviation
Food	450	12000	36000	29925.56	7292.513
Education	228	1200	100000	25122.46	30600.545
Clothing	450	850	19000	3588.62	3713.417
Entertainment	253	750	6000	2347.04	1408.999
Fuel	450	700	5400	1896.44	1775.520
Health	450	3500	8000	4569.49	754.908
Total Household Expenditure	450	30000	120000	69088.89	28436.482
Average Household Expenditure (Control Villages)					
Items	N	Minimum	Maximum	Mean	Std. Deviation
Food	150	5000	32000	15146.67	6308.231
Education	62	500	25000	1791.94	4420.678
Clothing	49	700	20000	1548.98	3110.391
Entertainment	41	200	1000	383.41	211.833
Fuel	25	400	4800	1004.80	1003.690
Health	150	150	12500	1134.00	2301.111
Total Household Expenditure	150	9000	63520	28444.13	9773.129

Source: Field Study

Impact on Social Capital

Social Capital has a distinct identity as it designates "networks together with shared norms, values and understandings that facilitate co-operation within or among groups" (OECD, 2001). It deals primarily with the linkages of communal assistance between clusters of people who are breathing in a collective way since long. But in the present research displacement either voluntary or involuntary interrupted the social networks of the mining affected communities. It fragments the prevailing social relation between the family members, modifies the social institution and association, transforms the rural social organisation and also disassembles the network ties of the affected communities. Here, MCL is not only displacing the mass from their own traditional lands but also forcing them to relocate in separate environments. In the process the project affected mass renovates their social networks in a whole new different set-up with which they were not acquainted with. Sometimes, after being displaced to other places they feel very insecure but they are bound to live.

At times the landowners are getting compensation package and are in a condition to build their houses either in a government specified place or at a place according to their own choice. In this situation they only contemplate about their individual identity and well-being rather than the communal feeling. So the individualistic attitude brings with it the issues like non-cooperation while staging for any kind of strikes against the injustice by MCL, absence of unity while celebrating rites and festivals, development of formal network ties, inter and intra-generational conflicts etc.

Though mining is capable of providing ample of employment opportunities, so an infinite quantity of both educated and uneducated masses from various states are migrating to this region to avail the opportunity. With this route of in-migration, the process of cultural amalgamation happens which ultimately ruins the ethnic identity of this belt. Many a time the local people happened to have mere puppets on the hands of bourgeois class only. Despite this, some social evils like alcoholism, child labour, corruption, criminality etc. have been emerged.

A CASE STUDY OF HENSMUL VILLAGE

Hensmul village is 10 kilometres away from Talcher town. This is also a panchyat which comes under Talcher block. The present population of this village will be around 200. Anybody will be shocked to witness broken houses which signify the amount of loss that the villagers have encountered. The actual reason behind the scenario of this village is, it comes under coal reserve area of Talcher Coalfield. MCL, a subsidiary of Coal India is mining coal in several regions of Talcher Coalfield. Bhubaneswari open cast mine is very close to Hensmul village. Because of the mining activity villagers of Hensmul lose all their cultivable land and livelihood options with which they were acquainted since beginning. Coal mining did not come alone rather it bring several direct and indirect impacts. Especially the villages close to mine face its consequences like acute water shortage. The village faces water shortage during summer the tube wells and dug wells dried off. Families have to depend on tanker water provided by MCL which isn't regular. For bathing purpose the villagers depend upon pond but presently the ponds are not in usable condition as coal dusts have grasped the water quality.

Picture 4.1: Polluted village tank, Hensmul

Likely, agricultural production was also affected as cultivable lands turned into mining yards. So the production unit turned into consumers and they purely depend on market. Instead of such sufferings the relief is that families who have lost their lands got job in mines. But the land less families become worst affected vulnerable than before. The village didn't have any access to

common property resources. Each family was compensated by job in the nearby mines which again ignites social conflict within the family. Prior to mining the primary occupation of the village was agriculture and after the initiation of mining, the villagers became mine workers. Subsequently the mining activity is spreading towards the village and owing to this reason they require to vacate the village. As they have witness how *Gilinda* a neighbouring village has witnessed fragmentation after displacement. Therefore, the Village Committee decided that they will ask for a patch of land where the rest of the families of their village can live together like before. But MCL authorities are trying to take hold of this place as quick as possible by providing cash in lieu of land. Again the land offered by MCL is 25 kilometers away from the locality near Angul which will be a difficult task for them to come every day from 25 kms as most of them are working in the mines. So the villagers of Hensmul are demanding a place close to the village but MCL officials are annoying the people by saying that it is the state govt. who allots the land to us and after that we built resettled colonies so we can't provide a land.

Generally the situation takes a lot many stages for its execution; so the MCL authorities are very desperate to vacate the place by taking the help of local administration. People of this village were strongly opposing it and few young fellows were leading the protest. Consequently MCL lodged different cases on the young fellow in order to slow down the protest, they started threatening the villagers by saying that if they would not stop this process they will be suspended from their job and some of them will be transferred to the other coalfield of MCL which is situated at Jharsuguda district. Instead of slowing down people became furious and started hunger strike. Immediately the local administration swung into action and MCL also withdraw the suspension notice including the cases registered against villagers in the police station. The above case study clarifies that, though mining has sheer negative impact on social capital, still a small bunch of affected communities are trying hard to preserve their ruined social articulations and identities.

Impact on Physical Capital

Physical capital denotes the basic physical amenities and some production entity which fabricates to sustain a livelihood. According to DFID the major physical components to sustain a livelihood includes affordable transport, secure shelter and buildings, adequate water supply and sanitation, clean affordable energy and access to information. Mining has a mixed impact on

physical capital. In the present study, at first, displacement by mining inclined the issue of shelter. Most of the displaced communities are finding it difficult to procure an appropriate land and build a house by investing the monetary compensation. As the market price is very high and the compensation provided to them is not at all sufficient to afford a roof over their head. While this is the situation of landholders we can clearly imagine the condition of landless communities. In spite of this issue, the employed bunch of MCL are earning good revenues and are also capable of nurturing some household level physical goods. The following table depicts a detailed picture about the possession of physical assets.

Table No.4.9: Possession of Physical Assets

Assets owned	Pre-mining		Post-mining		Control Villages	
	Yes	No	Yes	No	Yes	No
Cycle	355 (78.9)	95 (21.1)	409 (90.9)	41 (9.1)	117 (78)	33 (22)
Motorcycle	62 (13.8)	388 (86.2)	294 (65.3)	156 (34.7)	9 (6)	141 (94)
Tractor	22 (4.9)	428 (95.1)	25 (5.6)	425 (94.4)	1 (.7)	149 (99.3)
Pump set	36 (8)	414 (92)	5 (1.1)	445 (98.9)	4 (2.7)	146 (97.3)
Plough	257 (57.1)	193 (42.9)	41 (9.1)	409 (90.9)	83 (55.3)	67;8 (44.7)
Bullock cart	299 (66.4)	151 (33.6)	10 (2.2)	440 (97.8)	107 (71.3)	43 (28.7)
TV	66 (14.7)	384 (85.3)	343 (76.2)	107 (23.8)	24 (16)	126 (84)

Source: Field Study
Note: Figures in parenthesis are percentage.

It is clearly evident from table no. 4.9 that the physical assets like cycle, motorcycle, tractor and TV are highly possessed by the mining affected villages. Though agriculture is not in practice, still 5.6 percent households possessed tractor as they are earning noble currency while engaging this in mining related activities. But the possession of assets like pump set, plough and bullock cart are very less. These assets are used mostly in the agricultural activities and agriculture is all most a dream in this belt. But during pre-mining phase people were possessed these assets more in number. As agriculture was there primary source of occupation they used to preserve these

traditional means of occupational belongings. Even in the control villages though the village economy is agro-based, so the villagers are habituated with plough, bullock cart and pump set rather than TV, cycle, motorcycle and tractor. In the post mining phase the majority of the households i.e. 76.2 percent are having their own television sets which are comparatively very less i.e. 16 percent in the control villages. The reason behind this is very simple and clear and that is because of better financial condition.

Another major aspect of physical capital is housing pattern. In the process of land acquisition Talcher Coalfield has displaced 8294 Project Affected Families (PAFs). Of them, 4226 families have resettled. The MCL has provided resettlement site to the project affected families. But 1342 families are resettled at resettlement site and 2928 families are resettled according to their own choice (Table No. 4.10). Those people are resettled according to their own choice because the resettlement site is far away and there is a sheer absence of livelihood opportunities. In most of the cases villagers demanded a particular site where all villagers can be resettled. However, due to lack of alternative land MCL authorities were not able to fulfil the demands of affected villagers. Those who opted a site on their own were paid rupees three lakh as compensation in lieu of plot and rupees two lakh seventy eight thousands as building assistance. Even some of them are having employment in the mines. So they preferred to stay in the nearby region of mining. A detailed resettlement status of Talcher Coalfield is given below.

Table No. 4.10: Resettlement Status of Talcher Coalfield (As on 31.03.2014)

Sl. No	Name of the Project	No. of PAFs required to be resettled	Total No. of PAFs resettled	No. of PAFs resettled		Balance	Existing resettlement
				Resettlement Site	Site of their own choice		
1	Jagannath OCP	562	562	321	241	0	Handidhua & Ghantapada
2	Ananta OCP	565	485	340	146	79	-------
3	Bharatpur OCP	749	591	352	239	158	Kuio Jungle
4	Hingula OCP	3051	536	72	507	2472	-------
5	Lingaraj OCP	1133	961	0	961	172	Gurujang & Baghamara
6	Bhubaneswari OCP	1075	994	225	769	81	
7	Kaniha OCP	1159	97	32	65	1062	Takua
Total	NA	8294	4226	1342	2928	4024	NA

Source: MCL Office

The above table describes that in Jagannath OCP, 321 families are resettled at the resettlement site and 241 project affected families are resettled in the place of their own choice. In Bharatpur OCP, 352 PAFs are resettled in the resettlement site of Kuio Jungle and 239 families are staying at their own choice site. In the same way the PAFs of Lingaraj OCP and Bhubaneswar OCP are resettled in the Gurujang and Baghamara areas of Talcher. In addition to this 961 PAFs of Lingaraj OCP and 994 PAFs of Bhubaneswai OCP are resettled successfully. Similarly in Kaniha OCP out of 1159 PAFs only 97 PAFs were resettled. Of them 32 families were resettled in the resettlement sites and 65 families were resettled according to their own choice. In total 2928 PAFs were resettled according to their own choice and 1342 PAFs were resettled in the MCL specified resettlement sites.

The post mining scenario has brought lots of change in housing pattern of the affected villagers. The communities having better financial condition are staying in the *pucca* houses and the poor illiterate masses are continuing their stay in the *kutcha* houses. Even some of them are staying in the huts and temporary houses. A detailed assessment is given in the table no 4.11.

Table No.: 4.11: Type of House

House Type	Mining Villages		Control Villages
	Pre-mining	Post-mining	
Kutcha	146 (32.4)	60 (13.3)	50 (33.3)
Pucca	97 (21.6)	201 (44.7)	19 (12.7)
Semi-pucca	117 (26)	130 (28.9)	28 (18.7)
Hut	88 (19.6)	38 (8.4)	44 (29.3)
Temporary	2 (.4)	21 (4.7)	9 (6)
Total	450	450	150

Source: Field Study
Note: Figures in parenthesis are percentage.

The above table (4.11) shows that during pre-mining period majority of people i.e. 32.4% were staying in the *kutcha* houses. While during pre-mining period only 21.6% households were having *pucca,* during post-mining period majority of households (44.7%) are having *pucca* houses. Similarly the percentage of huts was more in the pre-mining phase. Though displacement is still continuing 4.7% households are staying in the temporary houses and are waiting to build their houses after receiving the compensatory money. But in the control villages a bulk amount of houses (33.3%) are *kutcha* and second major group of people (29.3%) are having huts only. 18.7% houses were found to be semi-*pucca* houses followed by 6% temporary houses.

The impact of mining activities should be taken into consideration as is the absolute source of reason behind non-practice of agriculture. There is a huge difference between mining and control villages in the practice of agriculture. Agriculture is not an important activity in the mining villages and the reason behind it is that, they do not have agricultural land to cultivate. Their farmlands had been taken away by MCL years ago. And this land acquisition process is growing with the enlargement of coal extraction.

In the mining area, due to displacement majority of the households were losing their occupation as they were entirely dependent on cultivation. In the context of agriculture, the pre and post mining situation is absolutely different as MCL has occupied extensive agricultural lands. The other reason behind the non-practice of agriculture is the amplification of coal dusts which has occupied the entire cultivated land. It is observable from the table no 4.12 and 4.13.

Table No 4.12: Number of Family members engaged in Agriculture (During pre-mining Phase)

Name of the village	Family members engaged in Agricultural Activity			Total
	Entire Family	All Adult Male	Nobody	
Balanga Khamar	10 (2.2)	24 (5.3)	41 (9.1)	75 (16.6)
Langijoda	30 (6.7)	25 (5.6)	20 (4.4)	75 (16.7)
Hensmul	23 (5.1)	30 (6.7)	22 (4.9)	75 (16.7)
Naraharipur	27 (6)	15 (3.3)	33 (7.3)	75 (16.6)
Danara	29 (6.4)	29 (6.4)	17 (3.8)	75 (16.6)
Jambu Bahali	22 (4.9)	43 (9.6)	10 (2.2)	75 (16.7)
Total	141 (31.3)	166 (36.9)	143 (31.8)	450 (100)

Source: Field Study

Note: Figures in the parenthesis are percentage

Table No 4.13: Number of Family members engaged in Agriculture (During Post-mining Phase)

Name of the village	Family Member engaged in Agriculture in Post-mining Phase			Total
	Entire Family	All Adult male	Nobody	
Balanga khamar	4 (.9)	0	71 (15.8)	75 (16.6)
Langijoda	5 (1.1)	0	70 (15.6)	75 (16.7)
Hensmul	4 (.9)	1 (.2)	70 (15.6)	75 (16.7)
Naraharipur	0	0	75 (16.7)	75 (16.7)
Danara	0	0	75 (16.7)	75 (16.7)
Jambu Bahali	0	0	75 (16.7)	75 (16.7)
Total	13 (2.9)	1 (.2)	436 (96.9)	450 (100)

Source: Field Study, *Note: Figures in the parenthesis are percentage*

It is distinguishable from the table no. 4.12 that, in 31.3 % households the entire family members were engaged in agriculture in pre mining phase. Similarly, 36% households were reported that only all adult male members were engaged in agriculture in pre mining and 33% households were engaged as wage labourers in construction sector or agriculture. But as compared to pre mining, post mining phase is totally different in the context of agricultural activities. In post mining period, most of the people are getting job in the mines and loss of agricultural land is ultimately deteriorating the agricultural activities. According to primary data in the post mining phase, only 3.1% of the household are cultivating their lands and 96.9% of the households were reportedly involved in diverse activities instead of agriculture. According to the elder members of Naraharipur and Danara before mining there were a lot of employment opportunities in the village but the wage rate was very low. So pre mining period was self-sufficient in compare to the post mining era.

While doing a comparison with the control village, about 40.7% households reported that they are undertaking agriculture and their entire family members were found to be engaged in this activity. Likewise 33.3% households reported that only adult members are engaged in the agricultural activities. It reflects that in control village still around 74% households are engaged in agricultural activities. Only 26% households are relying o0n other sectors.. This has been clearly understood in the following table (4.14).

Table No 4.14: Number of Family members engaged in Agriculture (Control Villages)

Name of the village	Number of family member engaged in agriculture			Total
	Entire Family	All Adult Male	Nobody	
Deraguda	40 (26.7)	19 (12.7)	16 (10.7)	75 (50)
Sardhapur	21 (14)	31 (20.7)	23 (15.3)	75 (50)
Total	61 (40.7)	50 (33.3)	39 (26)	150 (100)

Source: Field Study

Note: Figures in the parenthesis are percentage

The above discussions clearly indicate that mining villages are absolutely hooked on market for their livelihood. But in control villages, agriculture is the primary occupation and most of the households are involved in the agricultural activities. Due to the growing demand for coal and the availability of coal resources are pampering for the expansion of mining projects. Since

inception MCL is continuously acquiring lands through Land Acquisition Act and Coal Bearing Areas Act. A detailed description about the acquired lands is given below.

Table No 4.15: Area wise land Acquisition, Possession & Balance (As on 31/03/2014)

Sl. No.	Name of the Area	LAND ACQUISITION (IN HA.)				LAND IN POSSESSION (IN HA.)				BALANCE (IN HA.)			
		TENANCY	GOVT	FOREST	TOTAL	TENANCY	GOVT	FOREST	TOTAL	TENANC	GOVT	FOREST	TOTAL
1	Jagannath	1550.991	595.616	1334.486	3481.01	1310.696	566.683	999.417	2876.796	240.215	28.933	335.069	604.217
2	Hingula	2486.717	1774.20	128.295	4389.21	1601.328	738.071	90.380	2429.779	835.385	1038.13	37.915	1959.43
3	Lingaraj	652.546	165.748	285.183	1103.47	652.548	165.748	285.183	1103.477	0.000	0.000	0.000	0.000
4	Kaniha	778.679	296.677	301.524	1376.88	367.117	68.439	2.307	437.863	411.562	228.238	299.217	939.017
5	Bharatpur	1283.153	479.103	98.380	1860.63	701.013	266.992	98.380	1066.385	582.140	212.111	0.000	794.251
6	Talcher	113.855	325.560	68.498	507.913	109.759	325.560	0.000	425.319	4.096	0.000	68.498	72.594
Total		6865	3636	2216	12719	4742	2131	1475	8349	2073	1507	740	4321

Source: MCL Office

Due to the growing demand for coal and the availability of coal resources are pampering for the expansion of mining projects. Since inception MCL is continuously acquiring lands through Land Acquisition Act and Coal Bearing Areas Act. A detailed description about the acquired lands is given below.

The above table (Table: 4.15) shows that till March 2014, MCL has acquired 12719.21 hectares of land. Of them, 6865.94 hectares are tenancy land, 3636.90 hectares are government land and 2216 hectares are forest land. Again it possessed 8349.62 hectares of land. Out of them 4742.46 hectares are cultivated land, 2131 hectares are government land and 1475 hectares are forest land. Total balance land of Talcher coalfield is 4321.51 hectares. From them 2073.39 hectares are cultivated land, 1507.41 hectares are government land and 740.69 hectares are forest land.

Impact on Natural Capital

In the sustainable livelihood framework natural capital implies the access of natural assets like land, forest, wild resources, water, air quality, minerals and so on. Natural capital is the vital source of livelihood for the rural mass. Customarily they are so used to with the nature and

natural products that life is unthinkable without these regular assets. But the intrusion of mining activities is continuously harming the natural wealth.

The first major impact of mining on natural environment is pollution. Clean air in this belt is a dream now. Because the emission of coal wastes and the radiation coming out at the time of operation are the primary causes of air pollution in this belt. Though under CSR activity it has been clearly mentioned that at the time of transportation the coal loaded trucks must be covered through tarpaulins, but authorities are not paying serious attention towards this issue. So every day an uncountable limit of coal dusts are getting circulated in the air which ultimately causes air pollution.

The next important natural asset is water. Because of the radiation of extreme heat the water level in this region goes down. The ponds and other water bodies like streams and rivers which are already filled with coal dusts and ashes dries especially in summer seasons. For bathing and household purposes people need to go distant places. MCL's drinking water supply is also not regular. So people used to buy water from the nearby markets and sometimes they used to steal water from other's houses who owned their own bore well. The economically well-off communities have made their personal bore wells but the general mass is facing such type problems. In most of the times, the PAFs reported that the water provided by MCL is also not clean. They complained that a layer of greasy ingredient always drifts on water. Even the colour of water is entirely different than the normal water.

Generally, rural households are agro and forest based. Though agriculture serves as the prime source of livelihood generation, still forest based products are also called as the most important assets for the rural mass. The forest products such as bamboo, *tendu l*eaves, fire-woods etc. are the minor forest products which help them earn some money by selling them in the local markets. Even they have their hand in the common property resources from where they used to generate some bucks. For example, in the rural villages, the fishing community used to do fishing in the common ponds and rivers and it is also a source of livelihood for them. But these practises have totally been diminished from the society after the explosion of mining. The concept of herbal medicines has totally been changed. Now the rural mass is also absolutely

dependent on doctors for any kind of small diseases also. Another major impact is noise. The sound of blasting and movement of heavy loaded vehicles are causing varieties of problems. Though blasting leaves cracks on walls, it also needs maintenance. Sometimes it leads hearing problems among the local people. In the mining affected villages people are not willing to keep livestock. Because the livestock's are encountering various diseases through grazing contaminated grass and by drinking polluted water. Even the grazing lands of livestock's have been turned into barren lands because of pollution only. At present seasonal flowers and vegetables have become fantasies only.

But the situation is quite different in the control villages. They are living under the pollution free natural environment. The concept of pollution is almost unknown for them. They are surrounded by natural greeneries and the natural water bodies are also serving them efficiently. Under block development programme, the gram panchayat has provided them both tube wells and pipe water system. Here, almost all the households were found to be keeping some sort of livestock. Above all the natural capital of control villages is very strong in compare to the mining affected villages. So mining has a severe negative impact on the natural capital of project affected communities.

Impact of mining on livelihoods of women communities

The rural women do not enjoy superior status in comparision to their male counterparts. Though the male members are considered as main bread earners and the women communities used to manage the household income and/or expenditure strategy. Prior to mining the women folk used to collect minor forest products such as firewood, cereals, animal products, fibres, edible products and *kendu* leaves. But this scenario has changed with the establishment of mining industry. Subsequently, a sudden shift was perceived in the context of livelihood diversification of women communities. The communities who were once restricted only to the household works, are now contributing towards family income. At present women populations are actively participating in the mining related activities. It has been observed that in the mining affected villages only the scheduled caste and scheduled tribe women communities are taking active participation in the workforce. While working 7-8 hours a day they are earning 120 rupees per day. But the participation of upper caste women in these activities is almost absent. In this

context it was observed that the taboos like women should concentrate in the household work and working in the mines is not all prestigious, are preventing upper caste women to participate in the mining related activities.

Though rural economy is agro-based, it needs both men and women to generate their income from agriculture. Subsequently, women communities actively participated in the agro-based livelihood strategies. Specifically the SC and ST women communities of mining affected villages described that prior to mining they used to make bamboo baskets and leaf plates. At that period forest resources were available in abundant and by collecting bamboo and *sal* leaves they were in a habit of preparing and selling these products. But mining has diminished this occupational opportunity. However the growing market price is instrumental to promote women's participation in the non-farm sectors. But all are not fortunate to avail occupational opportunities in the mining sector, so a group of women were found to steal coal from the nearby mines and sell them secretly. The unavailability of forest products and the decrease of livestock are reason which pulls the households to buy coal for cooking purpose. Except some economically well-off households all most all the households are completely reliant on coal to preparation of foods. So for a group of women communities it paved the way to sell coal on regular basis. It has been observed that every household used to purchase 2 packets of coal in a week which costs 50 rupees.

Picture 4.2: Researcher interacting with villagers

On the other hand, the livelihood of the women communities of control villages is still protected. They used to participate in the agricultural activities of their village and are generating some income from forest products. In the mining affected villages women have no role in any of the self-governing commercial activities. But the women communities of control villages occupy themselves in preparing leaf plates, bamboo baskets, flower plants and garlands etc. Though forest is available in abundant the control group women members are continuously collecting the firewood, fruits, medicinal plants, mushrooms, cereals and *chara*. The availability and collection of these products definitely helps them to confine their expenditure on medicine, cooking fuel and up to some extent their food habits. Even they are planting some seasonal flower plants and vegetables and after serving their family's consumption level they are vending the products in the nearby markets. While observing the whole scenario it was clear that though some women communities are participating in the workforce, they are not getting the same wage with compare to their male counterparts. In the mining affected villages while male wage labourers are getting 150 rupees per day, women workers are getting 120 rupees. This situation is almost same in case of control villages also. Here, while male agricultural labourers are getting 100 rupees per day, women workforce is getting 70 rupees. . Although women groups are employing same amount of time and energy they are still deprived by the societal taboos.

5. COAL MINING AND ITS IMPACT ON ENVIRONMENT & HEALTH

Since independence, improvement in the health status of the population by raising the access to and utilisation of health, family welfare and nutrition services, has remained one of the major thrust for social development in India. In spite of the growth in the field of medical science and the consequent improvement in health globally over the past several decades; environmental factors remain a major cause of disease and death in many regions of the world. But the development projects which have been initiated to reckon the country in the threshold of economic development have always proven to be injurious. Through the large scale projects like mining, countries are earning good revenues but it has also brought with it serious health and environmental issues within its gamut. In receipt of the above mentioned consequences of mining, the present chapter is being devoted to observe the major health and environmental problems encountered by the project affected people of Talcher coal field and to assess the cost of these impacts.

Environmental pollution by mining has harmful impact on health. The major sources of pollution in the coal mining areas generally include drilling, blasting, over burden loading and unloading, coal loading and unloading, coal transport and losses from exposed overburden dumps, coal handling plants, etc. These air pollutants reduce air quality and this ultimately affects people in and around mining areas (Chaulya, 2004). Similarly, coal dust or wastes from mines spread to the nearby ponds and river resulting in water pollution.

With the above background the present chapter has tried to explore the impact of coal mining on local environment and rural health from a sociological perspective.

COAL MINING AND ITS IMPACT ON ENVIRONMENT

Coal mining and air pollution:

In the era of 21st century this belt has become an industrial hub. Along with MCL, a good number of coal based Thermal Power Plants (Talcher Super Thermal Power Project , Kaniha, Talcher Thermal Power Station, Talcher, Captive Power Plant, Nalco, Angul), several heavy industries (National Aluminimum Company, Angul, Heavy Water Project, Vikrampur, Bhushan

Steel and Strips Ltd, Jindal Power and Steel Ltd, Silicon steel, Nava Bharat Ferroalloys, Monet Ispat Ltd, Rungta Ltd etc), Coal washeries and a large number of ancillary medium and small scale industrial units have come up in the area. All these mining and industrial activities have caused momentous degradation of environmental quality and now this area is considered as one among 24 most polluted areas of India. While in one hand the natural resources available are degrading very first, the demand for resources have risen in this locality because of rise of industries and inflow of outsiders.

All most all the mining activities across the world are involved directly or indirectly with air pollution (Singh, Pal & Tiwari, 2007). Coal mining has a direct negative impact on air. However, the major cause of air pollution in opencast coal mines is the release of total suspended particulate (TSP) matter and respirable particulate (PM_{10}) matter (Sinha and Banerjee, 1997). During mining operation the activities such as drilling, blasting, movement of vehicles, transportation etc. usually emits particulate matter and smokes which is responsible for ecological imbalance and affects the health of living beings (TERI, 2013a). Study done by Katoria, Sehgal and Kumar (2013) expounded that majority of the opencast mines are responsible for the emission of fugitive dust to the air. According to them a coal stack of 50,000 tonnes is responsible for the emission of 250 tons of fugitive dust. The central source of fugitive dust is the vehicular traffic of the haul roads all through the process of transportation (Cowherd, 1979). The combustion of coal which produces carbon dioxide (CO_2), sulphur dioxide (SO_2) and oxides of nitrogen (NO_x) to the environment of the adjacent mining activity is also the second major source of air pollution (Zhengfu et al, 2010). As per a study conducted by Goswami, (Goswami, 2010), SPM had reached an alarming level of 1848 kg per square km in Talcher region in Odisha.

The primary sources of air pollution in the coal mining regions embrace the loading and unloading of overburden and coal, size reduction, blasting, drilling and transportation (Higginbotham et al., 2010a).

Picture No: 5.1 Picture of Bhubaneswari open cast mines

Source: Field Study

In this present study it was seen that the mining affected villages in this region are not totally free from the air pollution. The open cast mining activities has brought a new environment for the local communities. The different activities relating to mining have directly or indirectly contributed to air pollution. The associated activities with the open cast mines such unloading and loading of coal, transportation of coal, poor condition of roads and huge quantities of open air coal burning by the villagers are the causes responsible for air pollution. Mining operations share a number of common stages or activities, each of which may have adverse impacts on the natural environment.

Picture 5.2: Destruction of road and air pollution due to open coal transportation

Source: Field Study

In all the affected villages and the nearby areas it was observed that airborne emissions occurs during each stage of the mine cycle, but especially during exploration, development, construction, and operational activities. Mining operations generally mobilize large amounts of material, and waste piles containing small size particles are easily dispersed by the wind. The largest sources of air pollution in mining operations are: Particulate matter transported by the wind as a result of excavations, blasting, and transportation of materials, wind erosion fugitive dust from tailings facilities, stockpiles, waste dumps, and haul roads. Exhaust emissions from mobile sources (cars, trucks, heavy equipment) also raise these particulate levels. In the roads it was observed that during the movement of heavy vehicles which had tons of coal meant for transportation to other places was seen creating air pollution.

Tippers are normally best only for short hauls of coal but the major adverse environmental impacts resulting from tipper coal hauling which includes coal dust particle releases during coal loading or unloading, and coal dust entrainment during transport cannot be ignored. It was also realized that during transportation the loads were normally uncovered.

Picture 5.3: Air pollution due to open coal loaded heavy vehicle transportation

Even the trains which transports coal from the source point to the designated place poses serious threats as the loads are literally uncovered and after the passage of the train the fallen coal were collected by the villagers who uses the coal as a fuel for cooking which when burns produces

smoke full of carbon that pollutes and deteriorates the environment. As there is no control over coal theft all most all the villagers and local shopkeepers and eateries are burning coal for cooking purpose which contributes to air pollution. During winter season it used to create a pathetic condition as the entire area became smoke.

The policy guidelines of MCL highly discourage the movement of uncovered coal loaded vehicles but it was observed that most of the coal loaded tippers were moving without proper cover. Lack of proper monitoring mechanisms might be the reason for the above said cases. In this connection rather a blame game is being developed among all stakeholders. In a discussion MCL officials blamed the State authorities for not monitoring these issues. They claimed that around 85 percentage coal is being transport through train and only 15 percent coal is transport by tipper to local industries because of an MOU with State Government. They also claimed that till the MCL gate they monitor and give a clearance certificate, but the tipper drivers used to remove the cover once they cross the MCL gate. However, during our fieldwork such scenario was not observed. All most all tippers coming directly from mining areas are found uncovered. During the field study when the drivers were asked whether they were directed to cover the coal loads at the time of transportation to which they replied as no such directions were given at the time of loading neither they have paid any penalty for the same. Not only large amount of coals are destroyed as a result of uncovering of the loads but also the fallen coal acts as a pollutant which degrades the roads and mixes with the air particles.

Picture 5.4: Trucks carrying coal without cover

Though there was an agreement that a separate coal corridor road will be built, it is not yet ready due to lack of administrative support. Spillage from the tippers due to overloading and poor body condition of coal transport vehicles generates large amount of dust particles. The authorities have not taken sufficient measures for the collection of spilled over coal materials which has become a source of pollution. Dust generated is directly proportionated to the length of the coal transportation road and its condition. Coal transportation roads in this region are found black topped and is poorly designed and executed piece of work. They were constructed quite earlier when the coal production and transportation volume was 1/2 of the present level. Thereafter no regular repairing work is being done.

During summer the temperature in Talcher remains between 42 and 48 degree Celsius which is unbearable and what adds to the extreme summer condition is the mine fire. There are several mines of the MCL in the area. Of these, the huge stocks of coals in, Lingaraj, Bharatpur and Ananta mining areas regularly catch fires. A few stockyards of coal remain in continuous state of fire. The constant fire has soared up the atmospheric heat and polluted. As coal dispatch facilities are not properly developed the stocked coal lead to combo stone, fire and smoke. Whatever coal produced it should be disbursed. It should not be stored. The coal should not take to stocks, which lead to combo stone, fire and smoke. Coal dispatch facilities to be developed to avoid a chance of fire. However, the recent rise of demand for MCL coal has almost solve this problem. As around 85 % coals now produced are immediately dispatched.

Picture 5.5: Air and Dust pollution due to Fire in Mine

Source: Field Study

Though MCL has adopted some measures like using blast-less mining technology which eliminates the dust generating operations like drilling, blasting and crushing and mist type water spraying system along the conveyor belts/bunkers in the major coal handling plants but the blast less technology is not used in all the places. However, the officials assured that the conventional technology will be stopped everywhere within a very short period. Another mitigation measure as claimed by the MCL includes mist type water spraying system along the conveyor belts/bunkers in the major coal handling plants but the sufficient number of mist type water system was not found during the field study. . However, to deal with this problem MCL has taken an initiation to purchase 10 number of Mist blower cum road fogger machines to control dust.

In order to reduce the fugitive dust emission the MCL has started using Surface Miner Machine. Earlier it used to completely depend on the method of normal mining. Normal method of mining of coal or conventional method of coal mining involves Drilling of 160 mm to 250 mm diameter hole for a depth of normally 7 to 8 m through crawler mounted giant drills, charging of these drill holes with explosive and finally blasting the charged holes. The size of blasted coal or normally called Run of Mines (ROM) coal varies between 200 mm to 500 mm which is transported to the Coal Handling Plant (CHP) where it is crushed to a size of -100 mm and after that it is ready for dispatch to the power plants. Thus conventional mining requires basically three unit operations namely Drilling, Blasting and Crushing at CHP to make the coal dispatch able. Surface Miner is a machine, first time introduced in India at MCL for cutting of coal directly and the size of cuttings is less than 100 mm, thus all the basic unit operations involved in conventional mining i.e. drilling, blasting and crushing are altogether eliminated due to use of Surface Miner. No doubt the use of surface minor has reduced the production of fugitive dust, but still it produce some dust which add to the pollution. However, MCL Talcher is not totally depending on surface minor. Most of its mining activities are still depending on conventional method.

The picture below shows the scenario before and after starting of highly mechanized machinery called surface minor. Though officials claim that it does not create much pollution, but picture shows how it is adding to the pollution.

Picture 5.6: The scenario of air pollution before and after the use of Surface minor

Coal transport road is not much equipped with water spray system. Maintenance of fixed and mobile water sprinklers on roads, railway sidings, stock yards etc. are also not done by the MCL in a regular fashion. It should be a compulsion that both the road sides should have sufficient number of water sprinklers which is not seen in Talcher coal field. Occasionally some tanks were moving on road to sprinkle water.

Though MCL has taken serious step in installing and strengthening of existing dust collectors (using mechanical road sweeper), it is not successes in introducing this in all the cases. Still in most of the cases manual sweeping are carried out after the coal transportation. This practice is not scientific as the dust accumulated on the road sides again become air borne and settle on the road, subject to mechanical force of tyres, crushed further and become finer. In the presence of water on the road, this forms a paste like constitution on the road which is subject to tyre movement and the crushing is more efficient, when the water evaporated they become airborne.

The villagers depending on this road informed that the mitigation measures by the MCL are not carried out in a regular method which has become a serious issue. Even the villagers who are displaced and living at a range of 5 to 9 kilometers from the mine vicinity reported that they are not safe from these dust particles.

Picture 5.7: A manual sprinkling machine sprinkling water on road

Crushed Coal from CHP or directly from surface miner face is transported through tippers which unload the coal on the platform. Then pay loaders load the coal in the wagon. Due to the unloading, loading and movement of number of tippers Railway Sidings becomes a major source of fugitive dust emission. Though water sprinkling through mobile and fixed sprinklers and good house keeping through plying of wheel dozers are used to control the dust at railway sidings, still pollution is a major challenge here. So, new technology should be used to control the dust here.

Table No. 5.1: **Respondents Response on Pollution**

Name of the village	Mining has polluted the local environment?		Total
	Yes	No	
Balanga khamar	73 (97.33)	2(2.67)	75
Langijoda	59(78.67)	16(21.33)	75
Hensmul	75(100.0)	0	75
Naraharipur	75(100.0)	0	75
Danara	72(96)	3(4)	75
Jambu bahali	75(100)	0	75
Total	429(95.33)	21(4.67)	450 (100)

Source: Field Study

Table no (5.1) reveals that mining has indeed polluted the local environment (95.33% response in favour of the statement that mining as polluted the local environment). Villagers claim that the

dust particles when mixes with the air degrades the environment and as a result they are not happy with their working environment. A mere 4.67% of the sampled households said that there is no disturbance in the environment after the interception of mining. Most of all villagers said that before mining there was no such environment degradation in the atmosphere. They happily used to do their work with greater efficiency neither there were any movement of heavy vehicles or loading or unloading work but after the inception of mining there has been a dramatic shift in the condition of the air quality. Villagers feel like suffocation when they come out from their house. On the other hand in the control villages more than 90% of the sampled households reported of having good and congenial atmosphere. Villagers have access to the scenic beauty and fresh air and there is no alteration in it. Majority of the villagers in the control villages also feel comfortable in their working environment and give their maximum effort as there is no environment degradation. There have been much uproar among the public and concerned citizens against the lapses, but they seem to go in one ear and out the other of the MCL authorities. After taking views from the all the stakeholders, it is believed that MCL has taken measures for the abatement of pollution but lack of coordination, dialogues between the villagers and MCL might be the reason for increase in animosity of the villagers towards MCL which has resulted in such a negative response. This can be neutralized if a proper co-ordination will be developed among MCL officials and villagers and their grievances addressed in a proper way.

Table No. 5.2: Respondents response towards the MCL's initiation to mitigate the pollution caused by mining

Name of the village	Is MCL taking any initiatives to mitigate pollution		Total
	Yes	No	
Balanga khamar	6(8)	69 (92)	75(100)
Langijoda	5(6.67)	70(93.33)	75(100)
Hensmul	5(6.67)	70(93.33)	75(100)
Naraharipur	0	75(100)	75(100)
Danara	0	75(100)	75(100)
Jambu bahali	0	75(100)	75(100)
Total	16(3.56)	434(96.44)	450(100)

Source: Field Study

The above table no (5.2) reveals that around 96.44% of the sampled households responded by saying that MCL is not taking any mitigation measures in order to apprehend the pollution caused by mining operations. Villagers were also added that the mitigation measured which MCL claims that it is implementing in the affected villages such as use of blast less technology, use of water sprayer is highly insufficient. However, during fieldwork it was observed that though MCL has taken lots of initiation to control pollution, it has failed in reaching at complete solution. To examine the existing air pollution scenario the present study has taken the 10 years air ambient quality data measured by State Pollution Control Board, Odisha (SPCB). As per a study conducted by Goswami, (Goswami, 2010), SPM had reached an alarming level of 1848 kg per square km in Talcher region in Odisha.

Table No. 5.3: RSPM (PM_{10}) concentration in µg/m^3 (Jagannath Open Cast Project)

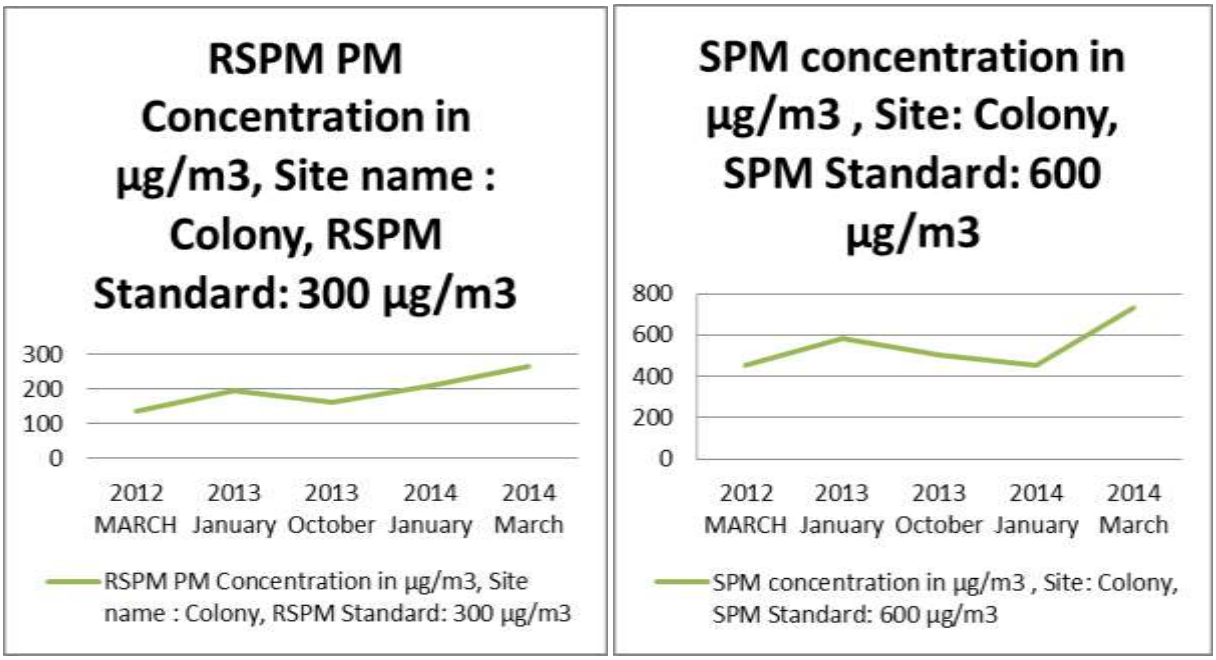
Site Name	03/ 2004	04/ 2005	02/ 2006	04/ 2006	03/ 2007	03/ 2012	02/ 2013	10/ 2013	01/ 2014	03/ 2014
Time Office	ND	ND	ND	ND	ND	225	210	215	340	229
Project Office	ND	180	295	275	171	ND	ND	ND	ND	ND
Colony	ND	ND	ND	ND	ND	135	195	163	209	266
Central Nursery	144	83	ND	140	ND	ND	ND	ND	ND	ND
Field Canteen	ND	ND	ND	ND	ND	ND	215	220	369	243
RSPM Standard: 300 µg/m^3										

Table No. 5.4: SPM concentration in µg/m^3 (Jagannath Open Cast Project)

Site Name	03/ 2004	04/ 2005	02/ 2006	04/ 2006	03/ 2007	03/ 2012	02/ 2013	10/ 2013	01/ 2014	03/ 2014
Time Office	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Project Office	ND	307	991	699	616	ND	ND	ND	ND	ND
Colony	ND	ND	ND	ND	ND	455	583	505	455	734
Central Nursery	352	162	ND	398	ND	ND	ND	ND	ND	ND
Field Canteen	ND	ND	ND	ND	ND	ND	594	551	766	458
SPM Standard: 600 µg/m^3										

ND = No Data

Figure No: 5.1 Trend in the RSPM and SPM Concentration in the Jagannath Open Cast Mining

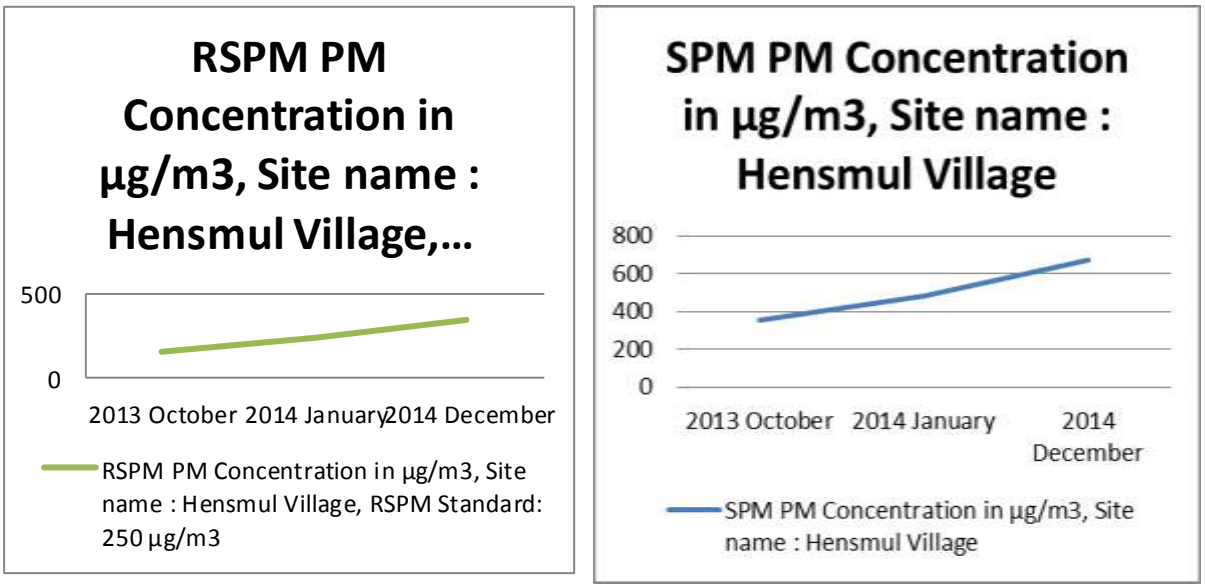


Source: Authors calculation

The above figure 5.1 shows the trend of RSPM and SPM concentration in the Jagannath Open Cast Mining. The values of RSPM and SPM recorded shows a fluctuating trend from 2012-2014 and then with a steep rise in the values of RSPM and SPM respectively in March 2014.

Figure no 5.2 given below shows similar scenario of RSPM and SPM concentration in the Hensmul village of Bhubaneswari mines. From the graph, it is ascertained that in the last few years, the values of RSPM and SPM have shown a steep rise.

Figure No 5.2: Trend in RSPM and SPM concentration in the Bhubaneswari Mines



Source: Authors calculation

The data collected from Odisha Pollution Control Board shows that nitrogen dioxide (NO2) and sulphur dioxide (SO2) levels for most of the coal mining areas are within the prescribed limits, however, high concentration of suspended particulate matter (SPM) and dust levels is a major problem in and around the mining areas of Talcher. Fugitive dust emissions, in particular, have been a major cause of concern. Presence of layers of dust on agricultural fields has adversely affected the production in and around the mining regions.

Periodic sampling of air quality is being done by the State Pollution Control Board under the sub section (2) of section 29 of the Air (Prevention And Control Of Pollution Act, 1981). A brief comparison is made using their sampling results for Jagannath Open Cast Project which is presented in Table 5.3 and 5.4, and can be considered as a representation for the other opencast mining working in the surrounding region of Talcher Coalfield. The highest concentrations of particulate matter are found within the mine with concentrations gradually diminishing with increasing distance from the mine (Trivedi et al., 2009), hence the expected concentration within the Jagannath Open Cast Project is much higher than the values reported in the above tables.

From Table 5.3 and 5.4, it is also observed that the concentration of these particulate pollutants is consistently increasing throughout the last decade. The SPM concentration is alarmingly high at all the sampling locations, whereas RSPM concentration which once used to be within

acceptable limits is now gradually approaching its standard acceptable value of 300 μg/m^3. In some cases it was observed to have crossed the standard limits. The rise of SPM in Jaganath colony that is residential area is really a major concern. The SPCB data of other mining areas shows that both the SPM and RPM has crossed the minimum level even in most of the residential areas. The 2014 data collected from Hensmul village and coal transport of city road of Bhubaneswari mine and Kumuda village of Lingaraj mine shows that both the SPM and RPM level has crossed the minimum level in all the villages. Yearlong exposure to high mean concentration of SPM and RSPM has been linked to various respiratory diseases and a decrease in the average life span.

It was also observed that the State Pollution Control Board is not concerned about the fine particulate (PM 2.5) fraction of the suspended particulates. Periodic monitoring of fine particulate matter by a pollution controlling regulatory is highly needed.

From personal observation, existing air quality data, personal interaction and photographic collection from the study area, it can be concluded that a major initiation is required to control the air pollution.

WATER POLLUTION

Another form of rampant ill effect of coal mining which the villagers claimed to be affected their normal lifestyle is the impact of coal mining on their water resources which perhaps is the most important aspect as far as the existence of the villagers are concerned. Villagers in the affected villages claimed that coal related waste and coal sludge are often injected in the nearby water bodies which makes the water unfit for domestic use. The ponds which the villagers earlier used as a bathing *ghat* exists no more as water has either dried up or the water bodies have been clearly dominated by the coal associated waste materials. During the field study it was found that as mining operations have exploited large areas of lands the problem of erosion is a major concern in the villages. Few learned villagers also exclaimed that erosion normally causes loading of sediments which has chemical pollutants in it that causes problems for them as during high wind it enters the water bodies which is a big concern. The impacts of heaps of waste materials, waste rock can be severe in the mining areas. In each and every affected villages it was witnessed that waste heap which consists of waste rocks may have coal associated waste which can enter the ground water through leaching and may cause contamination of ground

water. Villagers also expressed that they experience a change in the taste of the water that they now drink.

A recent study conducted by Nanda et.al (Table No.5.5) on water quality index in Talcher and Angul industrial belt measuring the physico-chemical data shows that as water value in most of the places crossed more than 100 so it is unsuitable for drinking. The MCL mining areas which includes Jagannath and Kalinga OCP also has crossed the desired value resulting polluted ground water, which is not suitable for drinking.

Table No.5.5: Water quality index of ground water of various study areas of Talcher-Angul industrial complex

Si. No.	Location	WQI of the year 2012-13		
		Winter	Summer	Rainy
1	Nuasahi, Well water	423	259	452
2	Giranga, wall water	379	244	360
3	Kulad, Bore well	496	296	399
4	Dasanala village, Dug well	339	369	371
5	Tulsipal, Bore well	272	182	258
6	Tamrit Colony, Bore well	395	241	364
7	Gotamara, Bore Well	418	238	386
8	Bonda, Borewell	173	151	160
9	Gadarkhai, Bore well	507	372	455
10	**Talcher Township, Borewell**	373	272	383
11	ITI Chhak, Dug well	413	254	386
12	**Jagannth OCP, Bore well**	371	248	381
13	**Kalinga OCP, Bore well**	381	231	375

(**Source:** Nanda, P.M, etal, 2015, Study of water quality index of ground water in Talcher-Angul Industrial complex, odisha, International Journal of Science, Engineering and Technology, Vol.3(1))

Coal mining not only has disturbed the water quality in the villages but has also resulted in water scarcity. As mining activities require large quantities of water, the availability of water put a big question mark. According to (Reza, 2010), an average of 86.26 million cubic meters of water is drawn per annum from the river for industry/mining activity in Angul-Talcher region of Odisha. Many coal mining regions are reported to confront the problem of over exploitation of ground water resources resulting in alarming lowering of water table (TERI,2013). Villagers are very much skeptical of the MCL's role for the preservation of water resources in their area. Few

villagers have also reported that MCL is continuously exploiting the ground water resources in a continuous manner which has affected the water table in their area. They cited the example of their existing tube well which they claimed that the tube wells now gives out water after 15 minutes of pumping which has a big variation from earlier. The villagers claimed that the wells, tube wells, ponds and streams in the affected villages are at first getting dried up due to the intense exploitation of water for mining operations. They claimed that before mining activities started in this area they used to get the water ¾ meters below the ground. Even all most all the bore wells remain functional during summer. The extraction of mining has reduced the water table. Especially in summer season they are facing lots of problem in getting safe drinking water. All most all the tube wells are becoming dysfunctional during summer. A severe water crisis has overtaken the area with the human beings, domestic animals and even wild animals and birds not availing adequate water. While natural vegetation is cleared up for new mines, the artificial plantations and compensatory afforestation developed by the MCL and State forest department are of little help. The interaction with MCL officials reveals that the consumption of ground water by MCL is quite low as compared to other industrial activities. Here it is mostly depending on surface water. Though we did not get pre mining water table data but the present data reveals that water table has gone down in comparison to the people's claim. Today during pre-monsoon period the water table is falling down around 7/9 meters (Table No 5.6).

Table No. 5. 6: Water Table data for the year 2014 (Angul-Talcher belt)

Si No.	Location	Longitude	Latitude	Pre-monsoon	Post-monsoon	Fluctuation
1	Ghantapada	85.1690	20.9293	7.95	3.15	4.80
2	Balanda	85.1555	20.9230	7.75	3.28	4.47
3	Santhaparha	85.2222	20.9036	8.45	5.15	3.30
4	Talcher	85.2305	20.9472	9.65	4.45	5.20
5	Gourmara	85.2130	20.8548	8.85	3.85	5.00
6	Kularha	85.1671	20.8399	6.35	2.35	4.00
7	Turanga	85.1241	20.8483	6.45	2.75	3.70
8	Barha Singarha	85.1347	20.9198	7.80	2.65	5.15

9	Donara	85.0961	20.9439	6.35	2.77	3.58
10	Raghunathpur	85.1537	20.9899	4.75	2.65	2.10
11	Sendhogram	85.2331	20.9259	7.45	5.25	2.20
12	Bhogaberni	85.2139	20.8917	8.65	5.15	3.50
13	Kukurhanga	85.1485	20.8948	7.75	2.45	5.30
14	Tentulia	85.1728	20.9191	7.85	3.46	4.39

Note: 'm bgl' = meters below ground level

The following table (5.7) has drawn below represents the sources of water pollution in the mining affected villages which has given by the household.

Table No. 5.7: Sources of water pollution

Sources of water pollution	Frequency	Percent
Mining water going to existing water sources	101	22.4
No recycling	60	13.33
Dumping ash	186	41.3
All	103	22.9
Total	450	100.0

Source: Field Study

The investigator has taken 450 household opinions about the sources of water pollution in the mining affected villages. Around 41.34% of the households stated that dumping ash is the major source of water pollution in the area and 22% of the household had given that the mining water going to existing water sources which cause water pollution in the area but it was not found in the control villages because the control villages are far from the mining. However, the recent initiative called 'Zero Discharge' undertaken by MCL is a major step towards combating the water pollution.

When asked about any mitigation measures such as putting bleaching powder in the water sources by the MCL to purify water, more than 50% of the villagers explained that MCL is not regular in taking up activities related to addition of bleaching powder to the water resources. However, our observation reveals that mine drainage water pumped out of the mine as well as

the water flowing out from OB dumps is put into settling ponds before being discharged in order to settle the sediments and prevent silting of rivers and other water bodies. The villagers further added that often the oily sludge which comes out during mining operations mixes with the water resources. This claim is also substantiated by the data provided by SPCB, Odisha given in table no.5.9.

On the contrary, the control villages viz. Sradhapur and Deraguda represent a different picture from that of the affected villages. During the field investigation in the control villages, 96 % of the villagers responded that there is no water pollution in their locality and they have still got access to clean and pure water. The ponds in their area have good amount of water which is fit for bathing. Water for domestic purpose is in abundance as there are number of tube wells which gives out good amount of water even during extreme summers the villagers exclaimed. Also activities such as the cleaning of the ponds are done in a regular fashion and the villagers are very happy about the fact that their water sources for bathing, washing and other domestic purpose are not polluted and are in the position of status quo since time immemorial.

To check the situation of water pollution some sample water was collected in the month of May, 2015 from mining discharge water of Bharatpur open cast mining, pond water from Jambubahali village in Bharatpur mining area and Deraguda (control) village.

Table No: 5.8: Water data of both Mining affected and non-affected village (all the value shown in mg/liter)

Content	Mining discharge water	Village pond	Control village
pH	6.4	7.2	7.4
TDS	170	148	110
TSS	45	15	10
BOD	2.8	1.9	1.5
Oil &Gas	3.4	1.9	0.5
Sodium	22.5	15.7	12
Nickel	**0.71**	**0.15**	0.05

Cyanide	BDL	BDL	BDL
Mercury	0.008	0.003	0.001
Manganese	**0.07**	**0.05**	0.03
Chromium	BDL	BDL	BDL
Iron	**0.45**	**0.31**	0.29
Arsenic	0.042	0.032	0.027
Lead	BDL	BDL	BDL
Cadmium	BDL	BDL	BDL
Cupper	0.005	0.002	0.001
Zinc	0.32	0.21	0.11
Sulphate	**275**	190	170
fluoride	0.5	0.3	0.3

BDL = below detectable limit

The data depicted in above table shows that except nickel, manganese, iron, and sulphate all other contents are bellow deviation level and under control in both the mining discharged water and pond water collected from mining affected village. However, in the case of control village the water data found normal in all content. While nickel supposed to be below 0.1mg/litter, it has reached at 0.71mg/litter at mining discharge water and 0.15 at pond water. The case is same in case of manganese, iron and sulphate whose standard value supposed to be 0.05, 0.3 and 250 mg/litter respectively.

For further strengthening our argument and finding out the impact of mining on local environment the existing water tested data on Talcher coalfield was collected from SPCB, Bhubaneswar, Odisha (table no. 5.9).

Table No: 5.9: Water Effluent Quality Data in MCL region of Talcher

Name of mining	Sampling Date	Sampling Point	Parameters (mg/l)				
			PH	SS	BOD	COD	O&G
Bhubaneswari OCP	30/10/2013	a)outlet of sedimentation tank discharged to banguru nallaha	7.3	28	4	27	----
		b) Outlet of ETP discharged to UG tank	7.4	**1266**	8	32	---
		c) Out let of O&G trap	7.0	44	4	11	5
		d) bangaru setu near BCML workshop	8.1	28	4	11	--
	22/07/2014	outlet of sedimentation tank discharged to banguru nallaha	6.8	**155**	4	24	----
Lingaraj OCP	30/12/2014	a) treated workshop effluent discharged to outside nallah	6.4	**136**	27	---	**12.8**
		b)final effluent discharged to outside nallah	6.6	**122**	22	--	**10.4**
Bharatpur OCP	01/02/2013	a)Outlet of workshop ETP	7.6	26	8	64	---
		b)outlet of ETP,village nallaha and Balram pipe leakage to banguru nallaha	7.8	28	16	224	--
		c) Outlet of STP	6.8	24	24	160	--
		d) Outlet of railway siding runoff discharge to banguru nallaha	6.8	**1826**	12	**288**	--
	14/03/12	a)Treated workshop effluent discharged on outside land	6.6	**146**	82	22	**14.2**
		b) Outlet effluent of STP discharged on outside land	7.2	43	**163.8**	32.4	---
Jagannath colliery Balanda	01/02/2013	a)Workshop ETP outlet	6.1	76	20	**288**	----
		b)Outlet of mine drainage treatment plant	7.3	24	8	128	----
Standard			6.5-9.0	100	30	250	10

Source: State pollution Control Board, Odisha

Both the BOD and COD tests are a measure of the relative oxygen-depletion effect of a waste contaminant. Both have been widely adopted as a measure of pollution effect. The BOD test measures the oxygen demand of biodegradable pollutants whereas the COD test measures the oxygen demand of biogradable pollutants plus the oxygen demand of non-biodegradable oxidizable pollutants. The data presented above shows that suspended sediments and COD in most of the mining areas and BOD in few cases have crossed the specified standard. Aquatic life will be disturbed due to reduction in photosynthesis, high suspended sediments, COD and BOD.

Drainage of mine water to various stream and rivers have affected the aquatic life. Many wildlife species are highly dependent on vegetation growing in natural drainages. This vegetation provides essential food, nesting sites, and cover for escape from predators. The development of mining projects that destroys vegetation near ponds, reservoirs, reduces the quality and quantity of habitat essential for waterfowl, shore birds, and many terrestrial species. The loss of habitat requirements for many animals did not permit them to adjust to changes created by land disturbance. These changes reduce wildlife.

Picture 5.8: Drainage in the village devoid of aquatic life

Source: Field Study

In India, 61.5% of the country's annual electrical power demand is generated from coal-fired thermal power plants. As Talcher Coalfield has large reserve of non-coking bituminous coal, a major share of from this region is consumed by the six neighboring thermal power plants which has a combined generation capacity of 6186 MW. These power plants were established around the Talcher Coalfields to save the cost involved in transporting the coal from the mines to the power houses. These power plants are major contributor towards the environmental pollution through fly ash in this region, whereas the generated electricity is supplied thorough the nation.

The solid combustion residue i.e. coal fly ash is a major environmental hazard and accounts to approximately 70% of the coal used in the power plant (by weight). The list of the power-plants

present along with their rated power generation capacities and amount of ash generated in 2014-15 are mentioned in Table no. 5.10.

Table No.5.10: List of power-plants around Talcher Coalfield along with their rated power generation capacities and amount of ash generated in 2014-15

Name of Unit	Capacity (MW)	Annual Ash Generated (in Tonne)
Captive Power Plant, NALCO	1200	1921804
Talcher Thermal Power Station, NTPC	460	1217254
Talcher Super Thermal Power Station, NTPC	3000	6313000
Nava Bharat Ventures (NBV)	158	200870
GMR Kamalanga Energy	1050	318145
Bhushan Energy	300	586784

From the above table, it is quite evident that the quantity of ash produced per annum is very high, it is categorised as major solid waste whose disposal is a global challenge. Due to the lack of viable technology for gainful utilization of these ashes, a major quantity is being disposed as land-fills in artificially created ash ponds thereby decreasing the already scarce agricultural land resource. Recently, MoEF has allowed the use of ashes for backfilling the abandoned mining quarry.

Some scholars working on water pollution further indicated that fly ashes are having high leaching potential of few heavy elements under favourable conditions. These elements/toxic heavy metals when released from the ash matrix will travel with the flow of water and is bound to degrade the quality of downstream/sub-surface water bodies. Praharaj et al (2002) worked on ground water contamination around an ash pond in Angul, which is near Talcher Coalfield and found Fe, Ba, Cu, Mn, S, Pb, V and Zn to be the major contaminants present in the area. The work also showed that the major metal contamination, apart from Pb attenuates at a distance of 900m.

The Committee Constituted by Hon'ble National Green Tribunal (2015) have analysed the ground water samples and ash samples collected near the ash disposal sites. However, the

committee reported that the water quality was within the BIS standards apart from the concentration of iron at 15 sampling locations.

The ash which is currently being disposed in the abandoned quarries of South Balanda and Jagarnnath OCP has just started; an extensive study of its leeching behaviour is required, which is beyond the scope of this work. Over time the quality of water is most likely to degrade because of the fly ash backfilling. The study of leeching potential will help in early prediction of surface and ground water contamination as a result of the ash filling in these abandoned quarries.

Abandoned Mine:

During field study it was observed that abandoned mines which are present near Anantapur Mines and near Jambubahali village has become a challenge for the environment and also a menace for the villagers. Much before the intrusion of mining activity the area was consisted of lush green vegetation but now the same land has become a source of environment concern. As per the guide lines issued by the Ministry of coal, Government of India, after the exhaustion of coal, the mines should be properly closed as per the Mining Closure Plan. Final Mine Closure activities should start towards the end of mine life so that the mining area is restored to an acceptable level in order to create a self-sustained ecosystem. The over burden dumps (internal) are first technically reclaimed and brought to the level of original ground. Then it is physically reclaimed by putting soil over it and leveling. Finally plantation is done which is biological reclamation. Though MCL has taken lots of initiation to biologically reclaim the mined areas, but it is not reached with a proper solution due to certain technical problems. Firstly while extracting coal there is certain short fall of soil quantity and proper reclamation of dump area not being practiced. In the abandoned mines the top soil is not being whether progressively or concurrently utilised for its reclamation which is making the environment degradable as it has become a dumping ground. As per the rules of mining closure act for successful biological reclamation of the abandoned mines the area should be planted with nitrogen fixing tree species or fruit bearing tree species and endemic and mixed culture. No doubt MCL has planted many plants as per the mining closer policies, but due to lack of monitoring mechanisms most of the plants are dead and also the villagers are not much aware about it.

Picture 5.9: Abandoned Mining Scenario in MCL Talcher.

Picture 5.10: Abandoned Mine (Bharatpur South quarry)

Source: Field Study

It is mentioned in mining closer policy that unless and until a mining company has ecologically reclaimed the abandoned mining, no further extraction will be allowed. Even it is mentioned that both the extraction and back filling of extracted areas will move simultaneously. However, till

now any back filling activities are not done for Bharatpur South Quarry abandon mining areas. During our interaction with officials it was observed that an agreement is held between MCL and NALCO to fill this quarry with fly ash of NALCO. As an initiation from NALCO the lean slurry transportation system (pipeline) for mine void filling at Bharatpur South Quarry is in advanced stage of construction. Pipeline of 15 km has already been laid down.

During the Field study it was also perceived that the excavated soil which should be used for backfilling in the abandoned mines were falling into the ground and the ponds located beneath it posing threat for the villagers. It is entirely the responsibility of the mine owner to ensure that the measures contained in the mine closure plan which includes reclamation of the abandoned mines should be carried out as per the rules but is not being done with true spirit. More than 60 % of the villagers claimed that MCL is not at all serious about the reclamation of abandoned mines nor it has conducted any ecological survey in the abandoned mine area in order to at least have the idea of the associated repercussions of the abandoned mining.

The data collected from MCL reflect that MCL has taken some serious steps in reclaiming the de-coaled lands. While the major portion of the lands (64.36%) are technically reclaimed, only 37% of area to be backfilled is technically and biologically reclaimed. Lack of sufficient land has created a problem for MCL to store the OB Dump and top soil. The practical problem faced by the MCL is that while excavating the coal there is certain shortfall of soil quantity held, which make it difficult to arrange soil for backfilling. Though MCL has shown its seriousness in planting trees in OB dump areas, the density of plantation is less and the quantity of fruit bearing plants are also less in number.

The development of coal mines has led to the loss of forest cover and simultaneously affected biodiversity and wildlife corridors in these forest areas. According to the Ministry of Coal (MoC), about 60% of coal resources are located in the forest areas (MoC, 2005). Most coal blocks allocated in the last few years have been in or adjoining forest areas. Of all the coal leases acquired by Coal India Limited (CIL), 28% lay under forest region i.e. out of about 2,00,000 ha of coal leases 55,000 ha lies under forest cover (Greenpeace Report, 2012).

The MoC estimated that given the rising demand the need for forest land for mining will increase from the about 22,000 ha in 2005 to about 75,000 ha by 2025. In Angul-Talcher region in

Odisha, for instance, forest cover has reduced by 11% between 1973 and 2007 due to coal mining (Singh P., 2010). Coal mining, especially open cast mining and the evacuation of coal requires large tracts of land for extraction processes, industrial purposes like thermal power plants and captive plants; as well as ancillary processes such as overburden dumps, pipelines, railway lines and public works. It destroys not only the standing forests but also animal corridors, diverted the streams.

Mining has affected the local environment and associated biota through the removal of vegetation and topsoil, the displacement of fauna, the release of pollutants, and the generation of noise. Mining of coal both surface and subsurface causes enormous damage to the flora, fauna, hydrological relations and soil biological properties of the systems. Destruction of forests during mining operation is invariably accompanied by an extensive damage and loss to the system. The overburden of coal mines when dumped in unmined areas creates mine spoils which ultimately affects the surrounding vegetation.

The destruction of ecosystem in post mining period has brought a great loss to the wildlife and their habitat. Both directly and indirectly it has damaged the wildlife. These animals live in communities that depend on each other. Survival of these species can depend on local ecosystem, soil conditions, local climate, altitude, and other features of the local habitat. The impacts stem primarily from disturbing, removing, and redistributing the land surface. Some impacts are short-term and confined to the mine site; others may have far-reaching, long-term effects. The most direct effect on wildlife is destruction or displacement of species in areas of excavation and heaping of mine wastes. As per villagers view most of the wildlife species are extinct. Mobile wildlife species, like game animals, birds, and predators have left these areas. More sedentary animals, like invertebrates, many reptiles, burrowing rodents, and small mammals are severely affected. The fragmentation of habitats due to mining activities has made difficult for some animals for their ecological move. In some cases the isolation has led to local decline of species, or genetic effects such as inbreeding. Species that require large patches of forest simply disappeared.

NOISE POLLUTION

Coal mining is a loud, day- and night-long process that includes, blasting, drilling, and constant moving of heavy vehicles. These mining related activities have resulted in the emission of loud noise which has disrupted the lives of those in the surrounding, communities and has reduced the quality of life. During the field investigation there were clear evidences that the ill effects of mining not only affected the environment but human habitats as well. Blasting which is done for the coal extraction shakes the ground for some distance around the blast site. Residential properties around the quarry have experienced significant increases in the effects of blasts. Villagers were very sad about the fact that they had invested astronomical amount of money for their houses but the vibrations which emerges out due to mining has given the villagers a big jolt. More than 60% of the villagers expressed that blasting related operations has brought disturbance in their studies. According to some of the residents, they could not sleep at night because of the blasting and the fact that heavy-duty trucks operates virtually all night to cart coal to the company's plant. Truck traffic makes varying noise levels. Haul trucks and loaders within the quarry are on the move continually during day and night times. Transport trucks arrive empty and are filled. Filling often results in loud crashes and thumps as empty metal bins are loaded. All trucks and mobile plants have loud and penetrating reversing beepers that are a constant nuisance to local residents

Table No. 5.11: Villagers response towards noise pollution in the study area

Name of the village	Have mining increased noise pollution in your area		Total
	Yes	No	
Balanga khamar	75(100)	0	75(100)
Langijoda	56(74.67)	19 (25.33)	75(100)
Hensmul	75(100)	0	75(100)
Naraharipur	73(97.33)	2	75(100)
Danara	73(97.33)	2	75(100)
Jambu bahali	75(100)	0	75(100)
Total	427(94.89)	23(5.11)	450(100)

Source: Field Study

Note: Figures in the parenthesis represent percentage

The above table elucidates the responses that were collected in the mining affected villages. It demonstrates that more than 94% of the sampled households responded by saying that yes there indeed has been noise pollution in their villages which earlier was not there. Noise pollution has dismantled their normal life. Regular blasting, movement of heavy vehicles in their area, loaders movement is a regular phenomenon which is the primary source of noise pollution. This has been shown in the following table

Table No. 5.12: Causes of Noise Pollution

Cause of noise pollution	Frequency	Percent
Moving of heavy vehicle	42	9.3
Blasting	408	90.7
Total	450	100.0

Source: Field Study

The above table represents that around 91% of the household report that the blasting is the major cause of the noise pollution and 9% of the household said that the moving of heavy vehicles in the mining area creates a noise pollution which was not found in the control villages. Due to noise pollution, the households faced a lot of problems i.e., hearing, mental disturbance, students study disturb and house cracking which has been clearly shown in the following table.

Table No. 5.13: Different types of problems faced by household due to noise pollution

Problem faced due to noise pollution	Frequency	Percent
Hearing	23	5.1
Mental disturbance	58	12.89
Student study disturb	3	.7
House cracking	366	81.3
Total	450	100.0

Source: Field Study

The above table represents the data about problems faced by the households near the mining area. Noise pollution is one of the leading nuisances generated by the mining activities. Around 81.3% of the households described that due to blasting in the mining sites their houses are being cracked and 13% households specified that they are suffering from mental disturbances. The noise pollution occurs due to the noise by the vehicles, bulldozers and excavators. But the central

cause of noise pollution is the forms of blasting using explosive material to get the rocks from the mines.

Our Personal observation during fieldwork reflects that the sound pollution is mostly due to transportation of heavy vehicles. Though 81% households claim that some crack has appeared in their houses, but not all the cracks are the recent one. MCL has taken lots of step to control sound pollution by using blast less technology, fixing of time of blasting, giving prior information of blasting to villagers, blasting time is very much limited and its effect is minimised by use of electronic delay detonators. It was noticed that the company is providing sufficient hearing protection materials (ear plugs and ear muffs) to operators and workers to reduce health hazards from noise. However, the impact of blasting on house cracking cannot be completely ignored. The following picture clearly has shown the consequences of blasting.

Picture 5.11: Blasting Effect on Housing Pattern at Langijoda village near lingaraj open mines

Source: Field Study

HEALTH PROBLEMS IN THE TALCHER COALFIELD

The number of coal associated activities such as coal-processing chemicals, equipment powered by diesel engines, explosives, dust from uncovered coal trucks have caused a huge set back in the environmental conditions that has deteriorated the quality of air in the village. However the air pollution in the post mining period has not only degraded the environment but has also created panic and has given a big jolt to the health status of the villagers in the form of increasing level

of illness, infections, diseases etc. As per the information garnered in the affected villages and numbers of evidences suggests that due to the impact of coal mining, there have been adverse health effect on villager's skin, eyes and occurrence of harmful diseases. Villagers are constantly being exposed to increasing levels of harmful air pollution, causing significant illnesses and leading to thousands of hospitalizations. An important study in the American Heart Association Journal Circulation in 2010 found that even short exposures to PM 2.5 μm in diameter (PM2.5) (a few hours to weeks) can trigger cardiovascular deaths and illness, while longer-term exposure (i.e. over a few years) greatly increases the risk for cardiovascular mortality than shorter exposures reduces life expectancy among highly exposed groups by several months to a few years. In the study villages it was found that dust particles borne through transportation, blasting has caused wide spread eye irritation and infections.

As the villagers are residing very close to the coal mines which exposed them to the various components of air pollution via breathing that poses threat. Inhaling of air pollutants are triggering asthma attacks, respiratory infections, or changes in lung function. The cases of suffering from asthma and respiratory toxicities are increasing due to lack of awareness and ignorance by people. Though MCL has organized lots of events to create awareness among villagers, but it has not succeeded in educating the mass regarding the harsh impacts of air borne diseases. When Sulphur dioxide is inhaled it irritates the lungs, triggering bronchial reactions and reducing lung function. The most measurable effects occur in children and in people with an already-compromised lung function. Other pollutants are absorbed and distributed in the body and may produce systemic effects or effects distant from the entry point of the lungs.

As a result, organs other than the lungs (e.g. the central nervous system, brain, heart, blood, liver and kidneys) are affected by air pollutants. Air pollution associated with the extraction, transportation and combustion of coal has caused ill health and deaths by contributing to the development of eye infections and several other diseases. The mining and transportation of coal has exposed the workers and local communities to dangerous coal dust, and diesel emissions from coal transport which has ill effects on the health condition of the villagers. Table 5.14 gives a clear picture of the health impact of coal mining in Talcher coalfield.

Table No. 5.14: Major Health Problems faced by Households in Talcher Coalfield

Diseases	Households affected in Mining Villages	Households affected in Control Villages
Fever	63(14.93)	15 (45.45)
Gastric Disorders	180(42.65)	10(30.30)
Skin Diseases	73(17.29)	Nil
TB	9(2.13)	Nil
Eye allergy	34(8.05)	Nil
Asthma	22(5.21)	3 (9.09)
Arthritis	41(9.72)	5 (15.15)
Total Households suffer	422(100)	33(100)

Source: Field Study
Note: Figures in parentheses show the percentage of the respective health problems to total health problems in the mining and control villages

The above table specifies that, introduction of mining has brought a serious threat to the health of local communities. A total of 450 households were surveyed in the mining villages. Out of these households 93.77% households reveals that they have suffered from some serious diseases in last 3 years. Among the diverse health problems Gastric Disorder is the most prevalent one which accounts 42.65% of the total health problems and this is because of the coal surrounding. The second major complaint is skin diseases which accounts nearly 17.29% of the sample households. The major alarming situation is that around 2.13% households are suffering from TB. Though, the cases are more in number it was not revealed by the concerned households. The adjacent coal belt was recorded as the region of highest temperature of Angul district. And this problem becomes very severe in summer. The district is considered as the hot spot of Odisha as it touches nearly 50^0C temperature during summer.

There are also other health problems like dehydration, cough and cold, asthma, etc. Though MCL is providing free medical facilities, these are restricted to employees and their family members. In this situation poor households are the worst sufferers. They have neither a job nor do they have free medical facilities.

This depressing picture of health status in the mining villages is very much in contrast to that of control village. In the total 150 households surveyed in 2 control villages only 22% of the households complained that they have some health problems during last three years. There is not even a single case of TB, skin disease and eye allergy found in this area. So it is abundantly clear that the incidence of TB and skin diseases in the mining areas and its neighborhoods is solely due to the mines and its pollutants, mainly coal dust. There are only few cases of fever, gastric disorders, arthritis etc. was found in this area, which is general in any village.

Cost of Ill Health

The cost of ill health includes direct and indirect medical costs which a household bears on behalf of health. While direct medical costs take account of the medical expenditure of a household such as doctor's fee, medicines and laboratory tests, on the other hand indirect medical cost refers to loss of work days due to ill health and income loss due to this (Bahl et al, 2004). In the present study, in order to calculate the total cost of illness, both direct and indirect costs were calculated.

Table No. 5.15: Direct Medical expenditure (Monthly)

Variables	Values (in days/rupees)
Pre Mining Scenario	
$A_{1:}$ Average doctor visit in a month	1.05
$A_{2:}$ Average cost of doctor's fee	Rs 32.77
Cost for sample household = C_1: $A_1 \times A_2$	34.40
B_1: Possible Case of taking Medicine	1.10
B_2: Average expenditure on Medicine	Rs. 37.27
Cost for sample household = C_2: $B_1 \times B_2$	Rs. 40.99
L_1: Probable Laboratory Test	1.10
L_2 : Average Expenditure on Laboratory Test	Rs. 24.97
Cost for sample household = C_3: $L_1 \times L_2$	Rs. 27.46
Post Mining Scenario	
$P_{1:}$ Average doctor visit in a month	2.81
$P_{2:}$ Average cost of doctor's fee	Rs. 131.58
Cost for sample household = T_1: $P_1 \times P_2$	369.73
S_1: Possible Case of taking Medicine	3.00
S_2: Average expenditure on Medicine	Rs. 477.33
Cost for sample household = T_2: $S_1 \times S_2$	Rs. 1431.99
M_1: Probable Laboratory Test	1.46

M_2 : Average Expenditure on Laboratory Test	Rs. 97.56
Cost for sample household = T_3: $M_1 \times M_2$	Rs. 142.43
Control Village Scenario	
M_1: Probable doctor visit in a month	1.00
M_2: Average cost of doctor's fee	Rs. 52.27
Cost for sample household = G_1: $M_1 \times M_2$	52.27
D_1: Possible Case of taking Medicine	1.00
D_2: Average expenditure on Medicine	Rs. 44.11
Cost for sample household = G_2: $D_1 \times D_2$	Rs. 44.11
N_1: Probable Laboratory Test	1.00
N_2 : Average Expenditure on Laboratory Test	Rs. 20.52
Cost for sample household = G_3: $N_1 \times N_2$	Rs. 20.52

Source: Field Study

The data collected from the field reveals that the introduction of the mining has not only created lots of diseases in mining affected villages but has also increased health expenditure. The table (5.15) displays the direct medical expenditure of mining village (before and after mining) and control village. This table clearly visualizes that due to mining the direct cost of medical expenditure has increased as compared to pre mining and control villages. After mining, most of the villagers' reported that they are getting affected by a lot of diseases which was not there prior to mining. In the context of control villages, their medical expenditure is as usual normal but slightly rises as compared to the mining villages. It was discovered that average doctor visit, cost of doctor's fee, average cost of medicine and average cost of laboratory test are much more in the mining affected villages than the pre-mining and control villages. The residents of mining affected villages revealed that they used to spend less much before the intrusion of mining activities. So here arises the question that why the medical expenditure is more in mining affected villages rather than the control villages. The only reason beneath the question is that mining has procured tremendous changes in the local area which in turn produced major grounds for air, water and noise pollution. But it was not found in the control villages. During field visit to the control villages, 75% households reported that they are spending less rupees on medical overheads in a year (Table No. 5.15).

Women and children do not constitute the major work force in the mining affected villages but they are the most vulnerable section of this region. More than 51% of the villagers claimed that frequency of women and children getting stuck with various diseases have increased enormously than the pre-mining phase. Due to constant exposure of dust particles they are more prone to the

diseases like skin infections and also experiencing malfunctioning of various sensory organs, which has a long-term impact on their reproductive health. Dust pollution and blasting have tremendous effect on pregnant women. But the condition is worst for a non-employee of MCL. Because of the economic reasons, women of this category of family have no choice but to expose themselves and their children to severe health risks, which not only threatens their lives, but also that of the foetus. According to the villagers the frequency of diseases also increased in manifold periods i.e. tuberculosis, cough and cold, malaria, skin diseases, diarrhoea, staining of teeth, joints pain, arthritis, lethargy are now the frequently occurring diseases in the mining affected villages.

Indirect Cost of Ill-Health

As it was discussed before, indirect medical cost comprises the loss of work days and income loss due to this. During field study, the households were reported that due to ill health they are losing their work days and income tremendously. The following table will describe the indirect cost of ill-health.

Table No. 5.16: Indirect Medical Cost (Monthly)

Variables	Values (in days/rupees)
Pre Mining Scenario	
D: Total Number of work days lost in a month	377
W: Average daily wage rate	Rs 103.42
W_1: Wage loss per household = W × D /(Total Sample)	Rs 86.64
Post Mining Scenario	
D_2: Total Number of work days lost in a month	2008
F: Average daily wage rate	Rs 240.29
W_2: Wage loss per household = F × $D_{2/(Total Sample)}$	Rs 1072.22
Control Village Scenario	
D_3: Total Number of work days lost in a month	148
J: Average daily wage rate	Rs 188.21
W_3: Wage loss per household = J × $D_{4/(Total Sample)}$	Rs 185.70

Source: Field Study

The above table (No. 5.16) is providing an entire gamut of indirect medical costs which the residents of Anugul-Talcher belt are encompassing regularly. During pre-mining period, all the 450 households lost 377 work days in a month. But in the post mining phase the same number households lost 2008 days in a month which indicates that mining has sheer negative impact on the health condition of respondents. At the same time, the indirect cost of control villages is comparatively low. Though the respondents of control villages are not affected by industrial activity, their indirect medical cost is only 185.70 rupees.

Total Cost of Ill-Health

The total cost of ill health is the addition of all the aspects i.e. direct and indirect medical costs. So the total cost of health hazards per household is as follows:

1. **Total Cost per Household (Pre Mining):**
   $TC_1 = C_1+C_2+C_3+W_1$
   $TC_1 = 34.40+40.99+27.46+86.64$
   TC_1 = Rs 189.49

2. **Total Cost per Household (Post Mining):**
   $TC_2 = T_1+T_2+T_3+W_2$
   $TC_2 = 369.73+1431.99+142.43+1072.22$
   TC_2 = Rs 3016.37

3. **Total Cost per Household (Control Village):**
   $TC_3 = G_1+G_2+G_3+W_3$
   $TC_3 = 52.27+44.11+20.52+185.70$
   TC_3 = Rs 302.6

From the above contentions, it is clear that the total cost of illness is high among the respondents of mining affected villages. However, the average direct medical cost of pre mining villages is reasonably less in contrast to the post mining villages. Henceforth, the average total medical cost of illness is high (Rs. 3016.37) among the respondents of mining affected villages in comparison to the pre mining (Rs 189.49) and control villages (Rs. 302.6). Henceforth, it can be concluded that the total cost of illness is severely high among the residents of mining affected villages.

It is not that MCL authorities are not aware about this and they are not taking any action to save these people from health risk, but the proper implementation of health related policies of MCL can solve major problems. The worst sufferers are the women in the mining regions, whose health issues in general, are marginally addressed in the country. India's development policies,

especially in the context of economic activities like mining do not take into account women's and children's health as important indices for human growth and development who cannot articulate the victimization of their bodies for the extraction of minerals. At present the occupation of the villagers are primarily non agriculture based which has alienated the women from their traditional way of food security, rights over natural resources and of course steered impediment to their health status. In this situation how do the government agencies, policy makers and civil society groups define and implement development as well as human growth vis-à-vis economic programmes from a gender perspective, especially in the health sector are a matter of concern both for the MCL and the statutory government.

Villagers who are inclined to consume locally grown products and locally caught fish may also receive higher than average exposure to deposited pollutants if they live close to a facility. In addition, some pollutants are transported in the atmosphere and deposited far away from the source. For instance, sulphur dioxide is transformed in the atmosphere tosulfuric acid and sulphates, which deposit up to 1000 miles from the source. Mercury can travel even further. Children and women living in the vicinity of open cast mines have the highest health risks. Adults are also experiencing some discrepancies by inhaling dust from the nearby mining regions. Furthermore, these people are exposed to numerous other air pollutants emitted from the mines associated with smokestacks and air pollution from other sources such as combustion of coal. Mineworkers and their families also often reside in the communities where the coal is being mined. Some of the additional health risks and dangers to residents of coal mining communities also include injuries and fatalities related to the collapse of high walls, roads and homes adjacent to or above coal seams being mined; the blasting of fly rock offsite onto a homeowner's land or public roadway; injury and or suffocation at abandoned mine sites; and the inhalation of airborne fine dust particles off-site.

There are serious health risks from exposure to air pollution in the affected villages as the villagers are continuously being exposed to pollutants for a long duration which may lead to serious casualties in the coming days. The Talcher-Angul coal belt was reportedly considered as the highest temperature zone mostly during summer. This belt of Odisha is considered as one of the hottest places in the state during summer the temperature climbs near 47-48 degree

centigrade. Not only the employees are travailing of several health issues but also several non-employees of MCL reported that they too are suffering from diseases like skin infections, respiratory diseases, asthma, TB etc. As they are nonemployee of MCL they are not provided with adequate treatment facility in the MCL hospitals. Therefore a huge part of their income goes in vain due to the coal mining associated health problems. Some villagers are demanding that MCL should have a policy that could provide at least 70 % of the medical expenses for a nonemployee.

COAL MINING AND ITS IMPACT ON LIVESTOCK

Livestock are considered as omnipresent economic resource for the poor communities across the developing countries. Two-third of resource-poor rural households estimated to keep several types of livestock in the world (Livestock in Development, 1999). Livestock husbandry practice is having varied reasons like producing food to produce a regular supply of nutrient-rich animal source food that provide a critical supplement and diversity to staple plant-based diets, generate income to meet an urgent need of cash, to provide manure so as to contribute a greater crop production for food and income , to provide traction power for transportation and crop production, to serve as financial instruments and enhance social status as an indicator of social importance within the community, (either based on the size of a family's livestock holdings or in their sharing of livestock with others) to strengthen social bonds (including the use of livestock as dowry or bride price) etc. Livestock related activities generates employment of a good percentage of agricultural work forces and promotes gender equity. More than three-fourth of the labour demand in livestock production is met by women. A number of states in India like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan show less stress of rural poverty where livestock accounts for a sizeable share of agricultural income as well as employment (12th five year plan, 2012-17).

Livestock husbandry is one of the significant agricultural sub-sector as it contributes 1.5 percent to GDP globally. About 29 percent of the world's land surface is used for livestock production, either by permanent pasture for grazing or croplands for animal fodder and feed. In a world where a growing number of consumers and producers have instant

access of livestock products, we should have a moral mandate to guide the expanding and rapidly changing global livestock sector so as to minimize its negative environmental impacts and maximize the potential benefits both economically and environmentally.

Before mining most of the villagers were reportedly keeping livestock to meet their daily expenses but with the initiation of mining activities it showed a sharp decline as the grazing lands were converted into mining lands and the agricultural production is at a standstill situation. Thus, the villagers are totally washed up to generate their routine food products. The most significant reason behind the loss of livestock is that, the mining operation conveyed countless changes as well as severe environmental impacts on the rearing and nurturing of livestock. In the pre mining era, there were number of income sources for the villagers but after the commencement of mining there is only one source of income i.e. business or job. The diversified source of occupation has minimized to only one. During pre-mining period, livestock was also a source of occupation of the rural poor but it has wiped out its significance due to mining. At the time of discussion regarding livestock, some households reported that they used to keep livestock such as cow, buffalo, goat, sheep and poultry birds but due to mining most of the livestock died and many of them became affected by diverse forms of diseases. Above with loss of agricultural land in post mining era & rise of cost of health care expenditure for livestock have discouraged the villagers to keep livestock with them.

Table No. 5.17: Medical expenditure on the Livestock (Mining and Control villages)

Cost of expenditure	**Mining villages**		**Control villages**	
	Frequency	Percent	Frequency	percent
Below 500	24	16.10	25	33.79
500-1000	23	15.43	35	47.29
1000-2500	70	46.98	13	17.56
2500-5000	24	16.10	1	1.35
Above 5000	5	3.36	Nil	Nil
NA	301	-------	76	Nil
Total	149	100.0	74	100

Source: Field Study

The data collected from field reveals that while 33.11% households in mining affected villages are having livestock, it is 50% in case of control village. While around 68.50% households in mining affected village spend more than 1000 rupees for annum, it is only 19% in case of control village (Table No 5.17).

ABANDONED MINING AND ASSOCIATED HEALTH PROBLEMS

The continuous coal mining exploration near Jambu bahali village and near Anantpur mines has not only given rise to the environmental issues but also developed various unhealthy challenges. During field investigation it was found out that rubbish depositories have been accumulated with no treatment and maintenance which has become a menace in the villages. Abandoned mines have become dumping yards and have resulted in the safe breeding grounds of mosquitoes in the study areas.

The residents of mining affected villages also reported that abandoned mines have disbursed numeral lives of their livestock and the numbers is still increasing. Even the villagers are not aware of the dangers associated with abandoned mining and while they are going for coal collection or taking bath in the nearby quarries, unknowingly they are becoming the victims of abandoned mines. Numbers of cow, goats have already fallen in the abandoned mines and have died. Deaths related to abandoned mining could have been prevented by creating awareness, sign boards near those mines but the inappropriate policies of the government and gross negligence of MCL has created havoc for the villagers. Villagers claimed that abandoned mines are full of hazards everything from snakes to explosives, with rotten timbers and crumbling shafts that living beings can fall into. The mines are so dark that if anything falls in it nothing can be seen. There were many incidences when few people, animals were trapped in the mines and got fatal injuries. Therefore it is obvious that that there are numbers of health related issues which have emerged due to the abandoned mining but the lack of seriousness of the MCL authorities and the state administration has resulted in a gross annoyance among the villagers.

OTHER HEALTH ISSUES

As we all are aware that mining operations require large amount of water, still the repercussions associated with it cannot be ignored. The condition of water in the mining areas of Talchar has worsened because of the large amount of coal wastes have contaminated the water resources in and around the villages. Villagers reported that it has been years that the surface and ground

water bodies have been polluted which has not only made the water unfit for cultivation but has also resulted in number of health problems among the villagers. Water contamination due to the mining activities has a long term effect and lasts longer than the short term economic gain from the mining. The villagers who are living in the mining areas have no choice and are forcibly using the contaminated water both for domestic and bathing/washing purposes. More than 75% of the villagers claimed that incidence of diarrhoea, dysentery have become common among the villagers. The most affected section of the people is the women class. Women in particular are the one who goes to collect water and have direct contact with water sources for performing household's activities such as washing clothes, bathing children and collecting water. Few learned villagers complained that certain harmful metals have polluted the water which the villagers are unaware of and which has resulted in marked irritation in the skin, respiratory tract, nasal ulcers, pneumonia etc. Few children in the villages were also seen having white sores and white marks all over the body. The local people were complained having frequent incidences of vomiting, eosinophil and diarrhoea. MCL boasts of treatment plant for water but the situation in the villages are otherwise. The taste of the water totally changed as it was earlier. Villagers have no other alternative but to drink the water which is available to them and they complain of foulness in taste and colour. During the field studies, it was also observed that waste from the top of the coal heap were seen falling in the pond which was located beneath and cows, dogs, were seen drinking the same water from the pond and the pond was the only source of bathing and washing utensils in the village Balunga Khamar.

Most of the women in the mining villages complained that they are not getting adequate water to drink and some of them also stated that they have to remain for four to five days without taking bath as the pond which were earlier used for bathing purpose are either covered with dust or have become dried up. The number of sources of water has also decreased due to the ill effect of mining. This is the common situation in all the mining affected villages especially in summer. No doubt MCL is providing water, but that is not adequate to meet all the water needs. Clothes of the children as well as elders were seen unclean and filthy. Children have the highest probability of getting affected in coming days if appropriate policy is not formulated for their betterment. Water pollution and shortage which has led to ill health has also resulted in mental illness as women have to wait for the tankers to provide them water whose frequency and timing

is absolutely unpredictable. Therefore it is directly linked with the mental tension of the women folk more particularly as they have to look after the household affairs including children.

When a comparative analysis is done between pre mining and post mining period it is clearly visible that displacement of the villagers has brought a big transition in the quality of life of the villagers especially from the point of view of health. In the pre mining period when the villagers had full access to forest, agriculture, CPR etc. their health and nutrition status was better as compared to the present scenario. The diversity of crops which were grown by the villagers earlier as well as the forest products such as roots, fruits, traditional herbs provided balanced nutrition to the villagers.

At present when all the forest land is being used in the public interest but there has been deterioration in the health status of men, women and children. Prior to mining the only source of medicine for the villagers was the forest herbs and obsolete aromatic plants but after the inception of mining they have no access to the traditional medicine and depending purely on the prescribed medicines of the doctors. Even now they are suffering from various diseases which they had never heard about. Medical services and medicine now are available in the medical stores which cost very high and the plight of a non-employee of MCL in this regard is very disgusting. Several Non-employee class revealed that they have to neglect their illness as they do not have the right to access MCL sponsored medical services nor have the requisite money to go for primary treatment. The worst sufferers are the women and children. When contacted with some of the doctors of hospitals they openly expressed that they are into this profession since many years and they claimed that the primary reason responsible for the poor health status and diseases for the villagers is mining. The frequency of the diseases occurring in both the experimental and control villages are described in the following table.

Table No. 5.18: Frequency of occurrence of diseases in study areas

Frequency / Diseases	Mining villages										Control villages				
	Daily		Weekly		Monthly		Yearly		Total		Daily	Weekly	Monthly	Yearly	Total
	B	A	B	A	B	A	B	A	B	A					
Arthritis	4	29	1	38	10	71	5	10			……	……	1	…..	1
Asthma	15	40	5	27	7	55	40	50					10	2	12
Gastro intestinal disease	5	137	15	61	7	36	5	10			5	1	11		17
Skin disease	5	48	7	22	10	60	30	72			…..	……	……	3	3
TB		7		2	2	3	2	6			…..	….	…..	1	1
Fever		2		1	3	98	130	237			…..	…..	22	81	103

Source: Field Work

The table (5.18) reveals that some of the diseases which were confined to very limited populations & almost occurrence in a year or month in pre-mining periods but it have spread to majority of population in post mining period. The frequencies of occurrence of diseases have increased. Gastro intestinal disease became a very prominent disease in mining affected villages. Unlike only 1% households reveals that they were suffered from gastro on a daily basis before mining activities. Even in case of controlled village the situation is more or less similar to the pre-mining period (3.33%). Fever, asthma became very common diseases in post mining periods. On the other hand, in the control villages more than 95% of the households expressed that neither there is noise pollution in their area nor there is any house which has undergone any sort of cracking. There is no movement of heavy vehicles in their villages. They are happy with the environment in which they are living. The situation in the control villages reflects completely the reversal of that in the affected villages.

On the other hand the two control villages exhibited different result. Villagers were seen happy with the condition of water they were getting and almost all the household reported that the taste

of water has not changed nor they are experiencing any water borne diseases. Women and children were seen in the control villages having pink of health and there were no patches or mark found in the body of children which was rampant in the mining areas. Water bodies were observed to be in good condition and absolutely free from impurities such as dust or any kind of lethal waste which was found in the mining affected villages.

6. CORPORATE SOCIAL RESPONSIBILITY (CSR)

The incorporation of Corporate Social Responsibility (CSR) has evolved in the business world as a result of the new era of global governance and politics. CSR is a company's demonstrable commitment to operate in an economically, socially and environmentally sustainable manner which should be transparent and increasingly satisfactory to its stakeholders. The CSR includes stakeholders, such as investors, customers, employees, business partners, local communities, the environment and society. The notion of social responsibility in the corporations and firms for its stakeholders is not a mundane phenomenon. The concept of CSR first created its space in 1953 as an academic discourse in HR Bowen's "Social Responsibilities of the Business". Most of the Public Sector Enterprises (PSE's) in India are implementing the CSR approach in their business arena after the Government of India (GOI) made strenuous laws for inclusive growth. Asper the GOI mandate on inclusive growth and challenges for corporate entity in a modern democratic society, business must release its wider social responsibility. In pursuant to this the Coal India Limited (CIL) has framed a policy for CSR applicable to CIL and its subsidiaries. On implementation of CSR policy by CIL RS 5/- tonne or 5% of retained earnings whichever is higher is being allocated for CSR activities to be carried out in the following year.

In Odisha, coal mining has profound impact on the people's livelihood and environment. The mining projects has displaced many indigenous populations by fading away their traditional livelihood. The Mahanadi Coal Field Limited (MCL) which is a branch of CIL is working in the four districts of Odisha and has implemented the CSR in its business operation. As per the mission of MCL which states "To produce and market the planned quantity of coal and coal products efficiently and economically in an eco-friendly manner with due regard to safety, conservation and quality", the idea of social responsibility is lucidly engraved.

THEORETICAL APPROACHES TO CSR

Although the idea of CSR has been in existence for more than half a century, there is still no clear consensus over its definition. One of the most contemporary definitions is from the World

Bank Group, stating, "CSR is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large, to improve their lives in ways that are good for business and for development. CSR as a concept or theme has been researched since 1950, notwithstanding to the fact that economy produce goods and service that society needs. After 1970 there was a primary shift to focus on social responsiveness to test the capacity of an organisation to meet social pressure. And after liberalisation and globalisation CSR become a powerful strategy of making a sustainable profit for the stakeholder as well as for the other actors. CSR Europe 2003 report argues that it is a win - win situation for the both the parties financial investor and the society at large.

Over the past decades, the concept of CSR has become an important subject to be researched. It is therefore viable to review some existing literatures on CSR in order to identify the research gap. Windsor (2001) in his article tried to delve into the past trend of CSR, Caroll‟s model analysis and found out the alternatives of CSR such as conception of responsibility, global corporate citizenship, and stakeholder management practices. These alternatives would bring the society and organization closer to each other. Sarbutts (2003) in his paper explored the ways of implementing CSR by small and medium sized companies. The research depicted a structured approach to manage corporate reputation and profit maximization of SME's through CSR. Small Corporation struggle to achieve more reputation with minimization of risk. In such a situation, CSR comes as hope for these companies. The lack of resources in the SME's can be a barrier for them to stay in the market. So, in that situation by imparting much information, proper utilization of resources, doing well for businesses, SME‟s can minimize their risk and manage CSR. Vaaland et.al (2008) study posed that CSR should be managed by handling unexpected incidents, long term reduction of gap between stakeholders and their expectations and company performance and finally maintaining relationship with society through interplay between actor, resources and activities. Truscott et al. (2009) in their article entitled as "The Reputation of Corporate Social Responsibility Industry in Australia" focused on economic, legal and ethical roles of CSR in the business. They affirmed CSR as a model of corporate reputation. In a study on the Bharat Petroleum Corporation Ltd. (BPCL) the author discussed that there is a broad relationship between the organization and society.

Organization used the resources of the society like material and human etc. And in reverse, the organization provides services to the society (Shah, 2010).

Brammer et.al (2012) depicted that CSR is not only a voluntary action but it is much more than that. In their study, CSR was defined under institutional theory. The institutional theory stated that corporate social activities are not only voluntary activities but it is a part of interface between business and society. Regulation and governance are necessary for enhancing the corporate performance of businesses through CSR. Bansal et.al (2012) in their paper entitled "Emerging trends of Corporate Social Responsibility in India" analyzed 30 companies of 11 sectors listed in the Bombay Stock Exchange with the help of their annual reports. Some of these sectors were Transport Equipment sector, Finance and Metal Mining sector, IT& Power, Capital goods, Telecom, Housing, FMCG, Oil & Gas and Cipla. The paper considered the nature and areas of society in which the companies are investing. By considering all those areas it was concluded that recently companies are not working only to earn profit but they have realized the importance of being social friendly.

From the above reviewed literature, it was found that CSR is gaining significance in the business organization and the spending on CSR needs to be increased. In the globalized era, there are ample of cases in which economic power is exercised at the expense of human ecology by the Multinational Corporation and Transnational companies. Therefore, there is an urgent requirement for adopting economic, social and environmental accountability and transparency in the business corporations. It is through CSR that the business organizations fulfil the above said functions. The success of CSR in addressing various environmental issues can be explained by the convergence of environmental and business interests. Within the branch of management and organisation studies, a company's response to the social and environmental issues has been variedly explained. Their explanations are mainly based on agency theory, stakeholder theory, stewardship theory, institutional theory, game theory, theory of the firm and the resource-based view in strategic management. However, there are two dominant perspectives on CSR, they are: the stakeholder theory and the institutional theory. The stakeholder perspective emphasizes on the reactions and responses of the individual firms in the context of external stakeholder relationships. The institutional theory mainly focuses on the adaptation of particular firms to the institution in a given case. These perspectives help us to apprehend why different firms and

industries respond to environment and society differently. It helps to know why different strategy is used by same MNCs or companies in different places.

The present study is adopting both the perspectives to understand the CSR in context of MCL. The stakeholder and institutional approach can help to explain company responses to external social and environmental pressures. In connection to social and economic pressure CSR mainly refers to voluntary actions undertaken by mining companies to either improve the living conditions (economic, social, and environmental) of local communities or to reduce the negative impacts of mining projects. By definition, voluntary actions are those that goes beyond legal obligations, contracts, and license agreements. In CSR programs, investment is usually made in infrastructure (potable water, electricity, schools, roads, hospitals, hospital equipment, drainage repairs, etc.), building social capital (providing high-school and university education, providing information on HIV prevention, workshops on gender issues, information on family planning, improving hygiene, etc.), and building human capital (training local people to be employed by the mining enterprise or to provide outsourced services, promote and provide skills on micro business, aquaculture, crop cultivation, animal rearing, textile production, etc.).

CSR IN INDIA

CSR has been playing a very significant role in the Indian economy since time immemorial. It was clearly evident that much of these corporate philanthropic activities had a national character encapsulated within it, whether it was an endowing institution to actively participate in India's freedom movement, or was embedded in the idea of trusteeship. Some observers have pointed out that the practice of CSR in India still remains within the philanthropic space, but it has shifted from institutional building (educational, research and cultural) to community development through various projects.

The provisions in Companies Act, 2013, have brought CSR to the forefront and through its disclose-or-explain mandate, are promoting greater transparency and disclosure. Schedule VII of the Act lists out the CSR activities and suggests communities to be the focal point. On contrary, by discussing a company's relationship to its stakeholders and integrating CSR into its core operations, the draft rules suggest that CSR needs to go beyond communities and beyond the concept of philanthropy. It will be interesting to observe the ways in which this will translate into

action at the ground level, and how the understanding of CSR is set to undergo a change. The CSR provisions within the Act is applicable to companies with an annual turnover of 1,000 crore INR and more, or a net worth of 500 crore INR and more, or a net profit of 5 crore INR and more. The new rules, which is applicable from the fiscal year 2014-15 onwards, requires companies to set-up a CSR committee consisting of their board members, including at least one independent director. The Act encourages companies to spend at least 2% of their average net profit in the previous three years on CSR activities. The Act lists out a set of activities eligible under CSR. Companies may implement these activities taking into account the local conditions after seeking board approval. The indicative activities which can be undertaken by a company under CSR have been specified under Schedule VII of the Act.

As per the above guidelines on CSR issued by the Department of Public Enterprises (DPE) in April, 2010, all profit making Central Public Sector Enterprises (CPSEs) are required to select CSR activities which are aligned with their business strategy and to undertake them in a project mode. CPSEs are mandated to spend their funds on CSR projects selected by them with the approval of their respective Boards. In the following table no. 6.1, the spending of top CPSE's on CSR is illustrated from 2010 to 2012.

Table No. 6.1: Accounts of CPSE's on CSR for two Fiscal Years

Sl No.	Name of the CPSE	Year	Total funds allocated for CSR (Rs. Crore)	Funds utilized for CSR (Rs. Crore)
1	Coal India Limited	2010-11 2011-12	262.28 553.33	152.33 77.33
2	Indian Oil Corporation Limited	2010-11 2011-12	131.11 95360	128.41 82.73
3	National Thermal Power Corporation Limited	2010-11 2011-12	72.37 45.52	72.21 49.43
4	Oil and Natural Gas Corporation Limited	2010-11 2011-12	335.352 378.48	219.03 121.08
5	Steel Authority of India Limited	2010-11 2011-12	94.00 64.00	68.95 61.25

*Source: LokSabha Unstarred Question No. 2881 dated 14.3.2013

MCL'S POLICY FOR CORPORATE SOCIAL RESPONSIBILITY (CSR)

The mines of MCL are located in different parts of the Odisha and extended to 4 districts. These mines are relatively located in isolated areas with little contact to the outside society. Mining of coal has a philosophical impact on the people living in and around the areas where the mines are situated. The understandable impact of the introduction of any production activity in such areas changes the traditional lifestyle of the original inhabitants and native communities and also changes the socio- economic profile of the area. Hence, the primary beneficiaries of CSR should be land oustees, project affected persons (PAP) and those staying within the radius of 15 kms of the project. Poor and deprived section of the society living in different parts of Odisha should be second beneficiaries. Moreover, MCL's CSR policy should be integrated with the business plan so that environment and social concerned are well addressed along with growth in business.

In the above mentioned backdrop, policy on CSR of MCL is broadly framed taking into account the following measures:

- Welfare measures for the community at large so as to ensure the poorer section of the society deprived the maximum benefits.
- It will take care of landless and project affected persons. Proper rehabilitation of the land ousters/displaced persons based on R&R policy separately formulated and the expenditure on R &R issues would be included in the project Cost.
- Contribution to the society at large by way of social and cultural development , imparting education, training and social awareness especially with regard to the economically backward class for their development and generation of income to avoid any liability of employment.
- Protection and safeguard of environment and maintaining ecological balance.

The other social responsibilities which MCL performs are mentioned in the table no. 6.2 below.

Table No.6.2: Scope and Description of CSR of MCL

Scope of Work	Description of the work
1. Education	□Support to Technical or Vocational Institutions for their self-development. □Academic education by way of financial assistance to primary, middle and higher secondary Schools. □Awareness programmes on girl education. □Counseling of parents. □Special attention on education, training and rehabilitation of mentally and physically challenged children/ persons. □Promotion of professional Education by setting up educational institutions offering courses in Engineering, Nursing, Management, Medicine and in Technical subjects etc. □Provide fees for a period of one year or more to the poor and meritorious, preferably girl students of the school in the operational area of the company to enable them to get uninterrupted education. □Provide cycle to needy girl students who are attending school in remote and distant areas. □Payment of MCL Scholarship to the students belonging to SC and ST respectively in the 4 districts i.eAngul, Sambalpur, Jharsuguda and sundargarh every year who are pursing Engineering Degree Course in IITs, NITs and other Government colleges and Diploma Engineering Course in Government Engineering college and (MBBS Course) Government medical colleges for meeting the reimbursement of tuition fees, Hostels fees and Incidental fee of Rs. 10000/- only per academic session from the academic session 2010-2011 and onward.
2.Water supply including Drinking water	□Water supply to village through mobile tanker in summer till permanent Arrangement □Installation/Repair of hand pumps/ tube wells. □Digging/ Renovation of Wells. □Gainful utilization of waste water from Underground Mines for cultivation or any other purpose. □Development/ construction of water tank/ponds.

	□Rain water harvesting scheme □Formation of task force of volunteers to educate people regarding proper use of drinking water. □Empowerment to the villagers for maintenance of the above facilities for availability of water.
3.Health care Organizing health awareness Camps	□Health care by organizing camps and providing health checkup and medicine. □Child and mother care □Operation Jyoti- Vision 2020 to help the people of the peripheral area for necessary assistance. □Fully equipped Mobile Medical Vans. □To supplement the different programmesof Local/State Authorities. □Senior Citizen Health Care
4.Environment	□Organizing sensitizing programmes on Environment Management and Pollution Control. □Green belt development □Afforestation, Social Forestry, Check Dams, park. □Restoration of mined out lands. □Development of jobs related to agro product Dairy/ Poultry/ farming and others. □Plantation ofsaplings producing fruit. □Animal care
5.Social Empowerment	□Self/ Gainful Employment Opportunities- Training of Rural Youth for Self-Employment (TRYSEM) on welding, Fabrication, and other Electronic appliances. □To provide assistance to villagers having small patch of land to develop mushroom farming, medicinal plants, farming and other cash crops to make them economically dependent on their available and resources, Training may be provided by agricultural experts for above farming. □Organizing training programmes for women on tailoring Embroidery designs, Home Foods /Fast Foods, Pickles, Painting and Interior Decoration and other Vocational Courses.

6. Electricity	To develop infrastructural facilities for providing electricity through Solar Lights or alternative renewal energy to the nearby villages. PawanChakki as alternative for providing electricity in villages.
7.Generation of employment and setting up Co- operative Society.	Employment facilities should be provided to the community people especially to the backward section by providing education and training thereby developing their skill for suitable employment. Further opportunities for self-employment should be provided by constructing shopping Complex in and around the projects. Besides, Co-operative Societies should be formed by active participation of local people for setting up Dairies, Poultries and Piggery etc., which will also help to generate self-employment
8. Infrastructure Support-construction, repair, extension etc.	Auditorium, educational institutions, rural dispensaries initiated by reputed NGOs, mobile Crèche, bridges, culverts & roads, check dam shopping complex to facilitate business/self-employment for local people, Community Centre, SulabhSouchalaya, Yatri Shed in Bus Stand,BurningGhat/Crematorium, Development of Park ,Playground/Sports complex/Good Coaches and Old Age Home.

Source: MCL, CSR Dept.

DETAILS OF CSR ACTIVITIES OF MCL IN TALCHER

The accounts of CSR activities of MCL have been recorded in table no. 6.3. The CSR activities of MCL included water supply, education, infrastructure, electricity, health, environment, sports and culture, social empowerment and other miscellaneous. In the year 2008-09, most of the expenditure was incurred for water supply, infrastructure and other miscellaneous activities. For the year 2009-10, the expenditure was more on water supply, followed by infrastructure and miscellaneous, other areas remained untouched and neglected. The CSR policy was implemented from 2010-11 by the CIL, hence from then, the spending on CSR activities has been increasing. In the year 2010-11 infrastructure development was more focused, most funds were released for construction of class rooms and boundary walls in schools and colleges. There was also spending on water supply, health, education and other miscellaneous. In the year 2011-2012, the expenditure on CSR became more inclusive and included almost every area, but the environment and social empowerment still remained ignored. For the year 2012-2013, the spending on health, environment and social development has increased. Expenditure on environment was held for the first time that to only confined to the plantation activities in Gurujang Village of Jaganath mining area.

Table No.6.3: Head wise detail expenditure of CSR activities of MCL (in lakhs)

Year	Area	Water supply	Edu.	Infra.	Health	Electricity	Envir.	Sports & Culture	Social Dev.	Mis	Total
CWS Talcher		0	0	0	0	0	0	0	0	0	0
2008-09	Talcher	0	0	0	0	0	0	0	0	0	0
	Bharatpur	0	0	0	0	0	0	0	0	0	0
	Hingula	0	0	0	0	0	0	0	0	0	0
	Lingaraj	15.88	0	12.99	0	0	0	0	0	25.73	54.6
	Kaniha	0	0	0	0	0	0	0	0	0	0
Jagannath		23.34	0	23.57	0	0	0	0	0	38.51	85.42
Subtotal		39.22	0	36.56	0	0	0	0	0	64.24	140.02
CWS Talcher		0	0	0	0	0	0	0	0	0	0
2009-10	Talcher	0	0	0	0	0	0	0	0	0	0
	Bharatpur	0	0	0	0	0	0	0	0	0	0
	Hingula	280.94	0	0	0	0	0	0	0	0	280.94
	Lingaraj	41.12	0	44.5	0	0	0	0	0	68.57	154.19
	Kaniha	0	0	0	0	0	0	0	0	0	0
Jagannath		47.84	0	9.74	0	0	0	0	0	9.29	66.87
Subtotal		369.9	0	54.24	0	0	0	0	0	77.86	502
CWS Talcher		0	22.4	0	0	0	0	0	0	0	22.4
2010-11	Talcher	27.4	0	1.49	0	0	0	0	0	0	28.89
	Bharatpur	22.54	7	0.28	0.1	0	0	0	0	0	29.92
	Hingula	114.68	0	10.05	0	0	0	0	0	4.05	128.78
	Lingaraj	43.89	3	182.98	0	0	0	0	0	7.06	236.93
	Kaniha	0	0	0	0	0	0	0	0	0	0
Jagannath		47.42	8.78	32.96	1.59	0	0	0	0	1.24	91.99
Subtotal		255.93	41.18	227.76	1.69	0	0	0	0	12.35	538.91
CWS Talcher		0	16	0	0	0	0	0	0	0	16
2011-12	Talcher	36.54	7.25	1.44	0	0	0	0.1	0	4	49.33
	Bharatpur	51.68	8.68	93.61	0.59	0	0	0	0	0	154.56
	Hingula	155.17	0	11.39	0	0	0	0	0	0	166.56
	Lingaraj	78.6	0	41.17	0	0	0	0	0	0	119.77
	Kaniha	0	0	0	0	0	0	0	0	0	0
Jagannath		77.38	0	31.28	3.68	0	0	0	0	7.14	119.48
Subtotal		399.37	31.93	178.89	4.27	0	0	0.1	0	11.14	625.7
CWS Talcher		0	0	0	0	0	0	0	0	16	16
2012-13	Talcher	34	7.25	2.78	0.37	0	0	0.05	1.4	0	45.85
	Bharatpur	42.02	6.27	68	0	0	0	3.47	13.39	0	133.15
	Hingula	133.42	12.62	37.12	0	1.99	0	12.78	0.45	0	198.38
	Lingaraj	67.54	4.92	129.01	0	9.51	10.06	1.1	0.8	0.71	223.65
	Kaniha	0	0.3	0	0.1	0	0	0	1.55	0.05	2
Jagannath		47.57	12.06	170.47	15.56	0	1.91	0.1	10.59	0.56	258.82
Subtotal		324.55	43.42	407.38	16.03	11.5	11.97	17.5	28.18	17.32	877.85

Source: MCL, CSR department

The spending on the environment in the present times reflects that the MCL authority is slowly adopting the sustainability principle and people are also becoming aware of the ecological devastation. However, the overall CSR expenditure in last four years shows that environment sector which is highly affected due to mining activities is highly ignored. Even during interaction with MCL officials the researcher found that officials feels that as it submits fund under CAMPA to Government of India, it is the duty of forest department to take care environmental aspects. The detail CSR activities carried out by MCL in Talcher coal field area is explained in Annexure-1I.

Provision of Safety and Security of Livestock

During the field investigation the researcher found a lot of variation in what the officials of MCL said and the real situation of the villagers. When we interacted with some of the villagers they replied that those CSR programmes only became practical when some ruling party members put political pressures on the MCL. On the other hand more than 90% of villagers have reported that there are no CSR programmes being carried out by the MCL. For the welfare of animals MCL authorities are aware that the livestock in their mining operation area are on the verge of extinction but still they do not have some robust CSR policies and planning under their sleeves for the betterment of their livestock.

Source: Field Survey

From the above figure, it is evident that most of the families in the villages didn't get any support for safety and security of livestock. Out of 450 families, only 13 families said that they are getting support for safety and security of livestock and 437 families report that they are not getting any support from MCL for the livestock.

Health Care Services, Awareness of Hygiene and Mitigation of Pollution in the Villages

The health care services in the peripheral villages were not much developed. The empirical study conducted within the mining areas of MCL got some insights on the availability of health care services and awareness for hygiene. In general, majority of the people claimed that MCL is not taking any initiative to address the health needs of the community. The villagers who are not employees of MCL do not enjoy free medicine or any other facilities. The villagers who are not employees of MCL deposit Rs.2 and get their health checkup, but for medicines they have to spend out of their pocket. Most of the people are still living in unhygienic conditions and are not aware of health care programmes those are very rarely implemented in the villages.

As observed during field visit, there is widespread pollution in the Talcher area which has made the living conditions miserable. However, for this MCL cannot be blamed alone. Along with MCL the rise of other industries like NALCO, Bhusan, etc have contributed to this pollution. The coal dusts are falling on surface water. The ponds in the villages are getting converted into stinking drains.

During our interaction with MCL authorities they claimed that different feasible measures wherever applicable is taken to mitigate pollution such as-

- Adoption of blast less mining technology which eliminates the dust generating operations like drilling, blasting, crushing, while sprinkling at the same time.
- Mist type water spraying system installed along the bunkers.
- Trucks carrying coal are covered to prevent coal particles getting mixed.
- Through the use of fixed sprinklers large capacity water tankers at the dust generating resources.

From the abatement of noise Pollution MCL lauds that they are the trendsetters in introducing all kinds of blast-free technology to prevent noise pollution. They employ certain measures such as:

- Some safety devices like earmuffs and earplugs are given to the workers.
- Controlled blasting is being practised to reduce noise.

In order to regulate, protect the village from water pollution certain initiatives are taken like

- Oil and Grease Traps (OGT) are used in the workplace to separate oil and grease from the waste water.
- Water Treatment plants are in operation where water is treated with sedimentation and then the water goes to field for paddy cultivation.

Table No. 6.4: Health Care Services, Hygiene and Mitigation of Pollution in the Villages

Name of the Villages	Balagakhamar	Langijoda	Hensmul	Naraharipur	Danara	Jambubahali	Total
	1. Health Care Services For the workers and Villagers						
Available	21	21	9	28	7	2	88
Not Available	54	54	65	47	68	73	362
Total	75	75	75	75	75	75	450
	2. Health Care Programmes in the Villages						
Conducted	6	7	5	0	1	0	19
Not Conducted	69	68	70	75	74	75	431
Total	75	75	75	75	75	75	450
	3. Hygiene and Care						
Available	6	5	4	0	1	0	16
Not Available	69	70	71	75	74	75	434
Total	75	75	75	75	75	75	450
	4.Initiatives to Mitigate Pollution						
Taken	6	5	5	0	0	0	16
Not Taken	69	70	70	75	75	75	434
Total	75	75	75	75	75	75	450

*Source: Field Survey

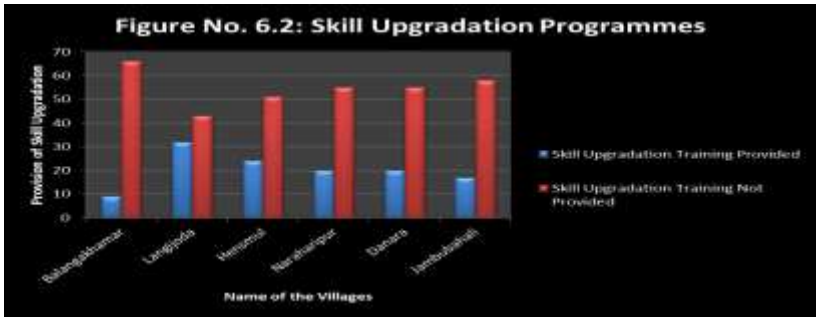
From the above table no. 6.4, it is clear that most of the health care services are not available in the mining areas and villages. The researcher had taken opinion of 450 families out of that 362 families reported that MCL has not built any health care institution for the services of both workers and other people in the community. Mostly health care center is centrally located where all employees get free treatment and other villagers by paying two rupees for health checkup. Nearby villages it is difficult to get any health centers build for public requirement. However, our observation during field work found that MCL has buildup some health care centers attaching to its mining offices which are mostly for their employees. In addition to that the researcher also collected some data on health camp programme. The villagers of the study area claimed said that health camp occurred once or twice in a year. And mostly they organized it in particular villages. However, the villagers feel that it will be better if MCL organized health camps in all villages instead of organizing it in particular villages.

Similarly the hygiene and sanitation in the village is also ignored by the MCL. Almost 95% of the villagers stated that MCL is not taking any kind of mitigation or abatement measures to check the unhygienic condition of the villages. Due to these unhygienic conditions, the villagers are prone to viral and contagious diseases. However, our personal finding reflects that MCL is serious on this matter and it is taking lots of step to mitigate. But due to lake of proper implementation strategy and monitoring mechanism it is not realized in the field and creating an agony in the minds of villagers.

The long list of mitigation and abatement measures as stated by MCL measures are in play but none are practically done or the frequency or feasibility of these measures raises serious questions on the credibility of MCL. The villagers reported otherwise and also what we observed that the almost all the houses had dilapidated walls; ponds had coal effluents, dust particles in all the areas etc. Around 95% of the sample households reported that MCL has not taken any initiative to mitigate pollution.

SKILL UPGRADATION TRAINING PROGRAMMES OF MCL

As per the mandate of MCL, it should undertake Technical Skill Development Training Programmes for a period of two years to the new comers to the company, PAP under the Rehabilitation and Resettlement (R&R) scheme. The programmes are conducted to make them skilled and competent to do more productive work. The new appointees are to be trained for engaging them in different technical and non-technical trades based on their educational status, sex, age, and physical standard. But the situation was completely adversary in the field. It can be noticed in the figure no. 6.2 below.



*Source: Field Survey

From the above figure it is quite evident that most of the skill up gradation training programmes of MCL was only restricted to pen and paper. In the field, it was found that in most of the villages, the new comers were not given any skill up gradation and training programmes. Around 73 % of the household reported that they are not getting any skill up gradation training and only 27% of the household said that they are getting skill up gradation training in the project and are placed in right jobs.

SAFE DRINKING WATER

Providing safety drinking water to its affected villagers is the main priority of all industries. MCL is not away from it. As per the MCL record from 2008 to 2009 it has spent around 2684.48 Lakh rupees under its CSR activities. Out of that 51.74% fund is only used for providing safe drinking water to its affected villages. Under these activities like providing tank water during summer season, constructing water tank, connecting piped water and establishing bore well were done. However, the data collected from sample villages and sample households reveals that only 67.11 households have received safe drinking water provided by MCL. The rest claimed that they are not getting any water provided by MCL (Table No.6.5).

Table No. 6.5: Villagers satisfaction with the amount and frequency of water getting provided by MCL

Villages	**Receiving Safe drinking water**		**Total**
	Yes	**No**	
Balanga khamar	50	25	75
Langijoda	57	18	75
Hensmul	55	20	75
Naraharipur	52	23	75
Danara	48	27	75
Jambu bahali	40	35	75
Total	302	148	450

Though CSR wing of MCL claims that they are providing highly purified water, villagers have given different opinion. During field work it was observed that problem during post mining period villagers are facing water crises. Out of those who claim that are receiving water from MCL only 27.48% households said that they are satisfied with the amount and frequencies of water they are receiving. It shows that majority of the villagers are not satisfied with the frequencies and safeness of water. Most of the villagers claim that the water which MCL is providing cannot be used as drinking water. It is providing water without purification. Villagers from Hensmul and Naraharipur have shown their higher dissatisfaction. They claim that as per their resettlement negotiation MCL supposed to provide 100 liters of water to each households every day. But MCL has breached that negotiation. Even in summer they are not able to get water. Only weekly two/three days they are getting water, which is not purified. They are using this water for bathing and other domestic use but not for drinking.

Table No. 6.6: Villagers satisfaction with the amount and frequency of water getting provided by MCL

Villages	Satisfied with the amount and frequencies of water received		Total
	Yes	No	
Balanga khamar	22	28	50
Langijoda	6	51	57
Hensmul	7	48	55
Naraharipur	1	51	52
Danara	20	28	48
Jambu bahali	27	13	40
Total	83	219	302

Source: Field Study

During field work it was observed that to solve the water crises MCL has set up few piped water system in few villages. Few village tanks are ecologically restored and renovated.

INFRASTRUCTURE AND ALLIED ACTIVITIES

Infrastructure plays a major component in the CSR activities of all the organization. As per the MCL record it has invest around 1021. 36 lakh rupees in last five year towards the development of infrastructures like road, bridge, community centers, boundary, market complex, village temple, seating places etc. If you compare the investment on infrastructure with the overall investment on CSR activities it shows around 38% (Table no. 6.3).

Picture 6.1 Village Community centre created by MCL CSR

Picture 6.2 Village Community Hall made with help of MCL CSR

Picture 6.3 Shopping complex in village created by MCL CSR

Source: Field Study BharatpurArea

Picture 6.4 Village community centre made with help of CSR of MCL Talcher

Though, it has been stated that a lot of infrastructural activities in the last five year, the present study reveals that all most all the villages got some road connection which is not properly maintained. As part of other infrastructural facilities few visible CSR activities like construction

of a community center, a small market complex, boundary of village club was observed in the village Jambubahali.

In the last five years MCL has spent around 11.05 lakhs under electricity development. Under this it spends money in setting up transformer, providing street light etc. however during our study it was observed that except Jambu bahali village nowhere electric transformer is being set up. All most all the studied villages have received one/two street lights with pole. Though education is a major area for CSR activities MCL has spent only 116.53 lakhs in last five years (Table no. 6.3).

The overall experience in the context of infrastructure development shows that there is not so spontaneous effort found in case of MCL in doing CSR activities. The CSR activities carried out in studied areas shows that wherever the local leaders are influential they got benefited and more activities are done. Form the studied villages the study found that as the Sarapancha of Danara Panchayat is more influential, most of the CSR activities were carried out in this panchayat including both the Jambubahali and Danara villages.

7. ROLE OF INSTITUTIONS AND ORGANIZATIONS

India is said to be a land of villages. In order to achieve the development of the people and the community as a whole Government of India has been implementing numerous programmes. Different institutions and organizations are working for the proper implementation and monitoring of these programmes and projects.

Along with different institutions Non- Government Organizations (NGOs) have been instrumental in the development of villages as far as India is concerned. A Non-Governmental Organization (NGOs) is a legally recognised terminology. NGOs are constituted by persons that functions independently. Its functions and controls are not under government's control but they follow Government's guidelines. It operates independently from any form of government. The term came into being from the United Nations (UN), and is normally used to refer to any organizations that does not comes under the purview of the government and are not conventional for-profit business. The number of NGOs operating in the United States is estimated at 40,000.International numbers are even higher: Russia has 277,000 NGOs India is estimated to have around 3.3 million NGOs in year 2009, which is just over one NGO per 400 Indians, and many times the number of primary schools and primary health centres in India. The term is usually applied only to organizations that pursue wider social aims that have political aspects; NGOs have number of advantages at their disposals. Because of location specific, committed nature of service the NGO sector has functioned efficiently for the uplifting of the position of the people in the society with their advantage of non- rigid, locality specific. NGOs through their various activities which are locally driven play a very crucial role in the process of managing number of developmental affairs at various levels. The Government of India has recognised the role of NGOs in the five year plan. Their credibility is reflected because they are closely associated with the masses, their professionalism and their nature of development which is a pattern of community driven development has been cherished.

NGOs have often maintained a field presence in the remote areas where the government officials are unable to reach and cater to the needs of the people however NGOs have developed a sense of concern with the rural poor. The rural poor, marginalised, socially depressed classes are

mainly dependent upon the operations of NGOs. The community development programs like adoption of villages for development, organising different health programs, agricultural programs, giving moral support during any kind of natural calamities training programs for the rural youths, housing projects, repair and renovation of houses etc. NGOs plays an important role in bringing up issues of the poor people in the fore front so that the uneducated, marginalised people are better up. Thus NGOs since time immemorial have been playing a sustainable role. NGOs role in identifying as well as catering the needs of the rural poor in sustainable agricultural development has been significant in the past. They have mastered a wide range of participatory methods which boosts the morale and also the productivity enhances. NGO' rapport with farmers has allowed them to draw on local knowledge systems in the design of technology options and to strengthen such systems by ensuring that the technologies developed are reintegrated into them (Chaguma & Gumbo, 1993). NGOs have also developed innovative dissemination methods, relying on farmer-to-farmer contact, whether on a group or individual basis (e.g., Sollows, Thongpan, & Leelapatra, 1993).

In the context of mining affected areas the functioning of NGOs is far from the satisfactory level. In all of the six mining affected areas that were selected for the field investigation not a single NGO was found working with the people and for the people. They are practically absent in the mining villages. At the time of taking responses from the villagers about the functioning of NGOs in their area it was quite perplexing that the villagers did not knew about the concept of NGOs and their functioning. They had heard it for the first time, it seemed from their responses. During field investigation more than 95% of the villagers claimed that there is not even a single NGO that is working in the villages for the betterment of the people. It was quite shocking to know that even few of the literate villagers who in the least had passed intermediate or matriculation did not know about the NGOs.

There are number of issues related to people in the villages ranging from issues related to health, environment, wages, safety, pure water, electricity and displacement. It would have been better if at least one NGO would have been working for taking up genuine issues of the villagers in the forefront. Villagers after knowing the functioning of NGO regretted the fact that they don’t have one functioning in the villages. NGOs could have worked in strengthening of community-based

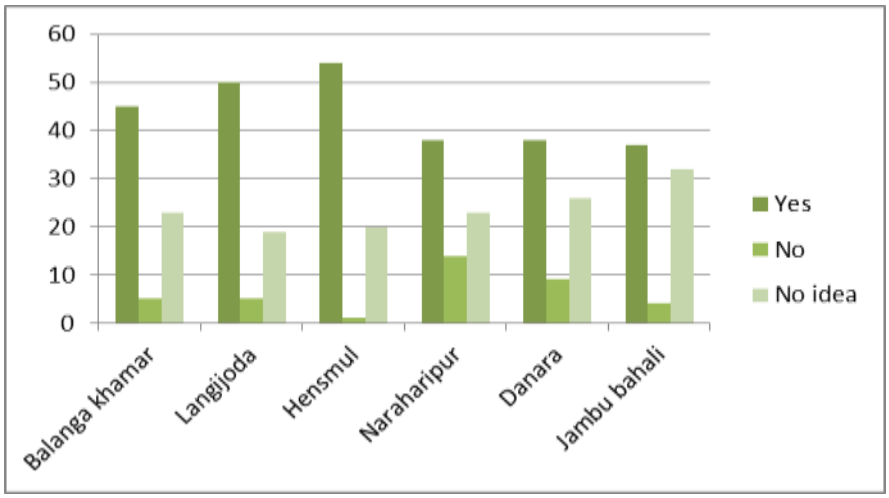
organizations and construct housing, provide infrastructure and operate and maintain infrastructure such as wells or public toilets and solid waste collection services. They could have also developed building material supply centres and other community-based economic enterprises. The number of conflicts among the government villagers and MCL is increasing in frequency day by day. NGOs in some cases, could have become spokespersons for the poor and attempt to influence government policies and programmes on their behalf in order to settle the dispute. Thus NGOs have a huge role to play in the villages ranging from being advocates for the poor to implementers of government related programmes; from agitators and critics to partners and advisors; from sponsors of pilot projects to mediators. The number of government welfare schemes and measures such as BPL card, Indira Awas, Job card are not distributed in the villages in proportion so NGOs would have advocated the need of these measures in a proper channel that would have helped the villagers in gross. Though, few NGO have done some research study in that locality but have not taken any step thereafter. Our interaction with NGO personnel reveals that as MCL is doing its CSR activities in the project affected areas, there presence is not required and they are quite confident that no funding agency will fund them to work in that locality as MCL is taking care of all problems.

As far as the role of Gram Sabha and Gram Panchayat is concerned in the context of India, they were formulated to strengthen the power of the rural people mostly the backward rural people so that they could develop their own area and have a say in the decision making process. The Sarpanch or the elected head of the village is entrusted with number of responsibility such as maintaining street lights, construction and repair work of roads in villages and also the village markets, fairs, collection of tax, festivals and celebrations, keeping a record of births, deaths and marriages in the village, looking after public health and hygiene by providing facilities for sanitation and drinking water, providing free education, to organise the meetings of Gramsabha and Grampanchayat, providing health services and facilities. Implementing development schemes related to agriculture and animal husbandry, planting trees in and around the village and to protect the environment, maintaining public parks and playgrounds, etc, implementing various government schemes. The central role of Gram Sabha and Gram Panchayat has been taking up issues of the village to the apex level where poor people can't reach so that their voices could be hear, their plight could be made known and the same can be pacified. Gram Sabha plays an

important role to protect the wild life, forest, biodiversity, adjoining catchments areas, water sources, and other ecological sensitive areas, preserve the habitat of forest dwelling Scheduled Tribes and other traditional forest dwellers from any form of destructive practices affecting their cultural and natural heritage etc. Therefore the scope of functioning of Gram Panchayat is very big and it encompasses aspects such as individuals, communities, forest, ecology, environment, cleanliness, etc. Numbers of welfare programs are given to the villagers such as Indra Awaas, Below Poverty Line card, National Rural Employment Guarantee Scheme (NREGA). It is the duty of the Gram Sabha/ Panchayat that the poor villagers do get the benefit of the social security measures that are provided by the state and central government. The Gram Panchayat acts as a medium between the government and the people.

The data collected from field shows that around 58.22% villagers admitted that before the intervention of mining company in their locality the Sarapancha called a meeting to discuss the matters with villagers.

Figure 7.1: **Response of the villagers towards holding of Gram Panchayat meeting before the intervention of mining company**



Though 58.22% respondents said that a meeting was called by the Gram Panchayat before the implementation of the mining, only 63% respondents were present in the meeting. Those who were present said that the entire meeting was concentrate on compensation and job allocation. Due to lack of information, poverty, marginality and fear towards the authority rest of the villagers were not present in the meeting. The rest of the villagers who are not aware about the

meeting called by Gram Panchayat said that they were not at all informed about the meeting. They claimed that Sarapancha might have called the meeting to pass the information to their followers.

Table No. 7.1: Presence of the Respondents in meeting called by Gram Panchayat

Village Name	Presence of the Respondent in meeting called by GP		Total
	Yes	No	
Balanga khamar	38	18	56
Langijoda	43	15	58
Hensmul	19	24	43
Naraharipur	12	16	28
Danara	20	9	29
Jambu bahali	33	15	48
Total	165	97	262

The scenario quite changed after the intervention of mining in the study areas. Gram Sabha/Panchayat on the other is losing its relevance in the affected villages. There were number of instances when villagers asserted that the Sarpanch or the elected heads often are lured by the mining companies so that they would not complain against MCL to the government authority and would not pass any resolution in the Gram Sabha that would have adverse impact on the functioning of MCL. Villagers also alleged that the Sarpanch of various villages also made deals with the MCL and the close associates of the Sarpanch who helped him in winning different elections were actually employed by MCL as contractors in the companies, In fact there is a big nexus between the MCL, Sarpanch and people from a particular political party who assist the Sarpanch at the time of elections. Only in some of the cases where the Sarpanch were dynamic different Corporate Social Responsibility works by the MCL were implemented. In most of the villages the Gram Panchayat also failed to take the issues to the upper level. In fact people in the

villages are losing their hopes regarding the credibility of institutions like Gram Sabha which were seen as a tool for the poor people.

The role of government administration is to ensure that different organisations such as the forest department operate with efficiency. The administration has certain set of skills that handles people and situations within the organisation. The roles of institutions are very much instrumental as numbers of plans and programmes that are chalked up by the government are implemented by the administration. For the administrator to succeed in implementing these plans, he must understand how, when and for whom the plan should be implemented. Besides planning, an administrator provides efficiency through organization. The organization allows the administrator to coordinate the efforts of a business to achieve one or a set of goals collectively. It is very much important for the administrator to issue proper guidelines to the individuals of administration so as the goals and objectives are accomplished. There should be proper delegation of authority, responsibility to control the supervisory staffs. The employees should have proper skills set so that there is no disguised employment. Additionally, an effective administrator will use the capabilities of the staff to make the plan succeed. By engaging in dialogues between the people in one hand and various organisation on the other hand different aims and objectives of the government, growing conflicts of the government and people, disruption in the functioning of the government can be easily solved.

The knowledge from the field shows that the role of government administration is literally absent in the mining areas. Except few cases the district administration is quite silent. Only in few cases the collector office recommends some of the rural development activities to the MCL CSR department to carry forward. The administration specially the forest department has a huge role to play in the mining areas for the development of the environment which will lead to balanced development.

ROLE OF FOREST DEPARTMENT REGARDING UTILISING CAMPA FUND

In the mad rush development every country want to develop and compete with each other. Therefore many development and industrial projects such as erection of dams, mining, and construction of industries or roads require diversion of forest land. Any project proponent,

government or private must apply for forest clearance from Ministry of Environment and Forests (MoEF), before the conversion of land take place. This proposal is to be submitted through the concerned forest department of the state government. If clearance is given, then compensation for the lost forest land is also to be decided by the ministry and the regulators. In this process the user agency have to submit the compensation NPV, CAMPA fund and Wild life conservation fund in case of any wild life habitation exists on the proposed area.

OBJECTIVES OF CAMPA

Compensatory Afforestation Fund Management and Planning Authority (CAMPA) are meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.

National CAMPA Advisory Council has been established as per orders of The Hon'ble Supreme Court with the following mandate:

- Lay down broad guidelines for State CAMPA.
- Facilitate scientific, technological and other assistance that may be required by State CAMPA.
- Make recommendations to State CAMPA based on a review of their plans and programmes.
- Provide a mechanism to State CAMPA to resolve issues of an inter-state or Centre-State character.

State CAMPA

The Hon'ble Supreme Court also approved the guidelines prepared by the MoEF for utilizing CAMPA funds by an agency to be constituted in the states and to be known as The State CAMPA.

Some of the important points in the guidelines are highlighted here:

- The State CAMPA would presently receive funds collected from user agencies towards compensatory afforestation, additional compensatory afforestation, penal compensatory afforestation, Net Present Value (NPV) and all other amounts recovered from such agencies under the Forest (Conservation) Act, 1980 and presently lying with the Adhoc CAMPA.

- The State CAMPA would administer the amount received from the Adhoc CAMPA and utilize the funds collected for undertaking compensatory afforestation, assisted natural regeneration, conservation and protection of forests, infrastructure development, wildlife conservation and protection and other related activities and for matters connected therewith or incidental thereto.
- State CAMPA would provide an integrated framework for utilizing multiple sources of funding and activities relating to protection and management of forests and wildlife. Its prime task would be regenerating natural forests and building up the institution engaged in this work in the State Forest Department including training of the forest officials of various levels with an emphasis on training of the staff at cutting edge level (forest range level). In short, the department would be modernized to protect and regenerate the forests and wildlife habitat.

The guidelines also talk about establishment of an independent system for concurrent monitoring and evaluation of the works implemented in the States utilizing the funds available.

In sum, the prime task of State CAMPA would be regenerating natural forests and building up the institution engaged in this task in the State Forest Department.

PROCEDURE FOR RELEASE OF FUNDS

Each state has a Governing body, Executive Committee and Steering Committee for smooth function of and utilisation of CAMPA fund. The Governing body headed by the chief Minister lays down broad policy framework and reviews its work from time to time. The Steering Committee having Chief Secretary as its chairman approves its rules and procedure, monitor the progress of fund utilisation and approves APO's, reports and accounts. The Executive committee as PCCF as its head prepares and submits the APOs to Steering Committee for approval,

supervises the implementation work submits report to Steering Committee & prepares annual report of the state prepares the APO (Annual Plan of Operation) and then it was sent to the Steering Committee for approval. After approval the APO was sent to the Ad-hoc CAMPA. The APO must be approved by the DGF On the basis of the APO submitted by the state the fund was being transferred to the state nodal agency. And the State CAMPA implements various schemes through the field offices of Forest department and provides fund by transfer to bank accounts to the respective field offices as per approved APO for implementation.

As per provision the State Government has deposited around rupees 28,591,478,876/- to ADHOC CAMPA since 2009 till 2013. Year wise detail is given bellow.

Table No: 7. 2: Detailed Deposit of Funds under ADHOC CAMPA from 2009-10 to 2012-2013

In Rupees

Sl. No.	**Year**	**NPV**	**CA**	**Addl. CA**	**PCA**	**SZ**	**1.5 SZ**	**CATP**	**WL Mngt**	**Others**	**Total**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	2009-10	4,126,048,395	133,068,955	0	16,225,800	5,387,100	5,060,030	138,110,200	495,627,295	74,458,484	4,993,986,259
2	2010-11	18,071,382,402	71,040,816	0	36,203,416	15,324,674	9,243,178	0	547,040,730	143,970,463	18,894,205,409
3	Deposited through RTGS during 2010-11	543,657,886	38,651,312	0	0	2,183,500	1,653,000	43,519,644	130,087,659	24,223,664	783,976,665
4	Deposited through RTGS during 2011-12	673,093,759	607,748,785	0	6,856,817	12,645,900	2,241,700	0	383,400,438	52,374,889	1,738,362,288
5	Deposited through RTGS During 2012-13	1,113,288,368	348,553,593	221,626,800	17,376,599	39,838,703	22,967,501	0	354,665,175	62,631,516	2,180,948,255
	Total	**24,527,470,810**	**199,063,461**	**221,626,800**	**76,662,362**	**75,379,877**	**41,165,409**	**181,629,844**	**1,910,821,297**	**357,659,016**	**28,591,478,876**

Source: Department of Environment and Forest, Govt. of Odisha

As per the Act every year after submitting the utilization certificate for last year the State Forest Department used to submit an outlay to Adhoc CAMPA. Accordingly the central Government release the fund to State CAMPA. The status of fund received by the Odisha Government and up-to-date expenditure incurred by various APOs of CAMPA are given below.

Table No: 7.3: Detail financial status of CAMPA fund and its Expenditure (in crore)

APO	Outlay	Date of receipt of funds	Fund received from Adhoc CAMPA	Expenditure incurred
2009-10	238.3975	25.8.09	131.0618	124.1193 (Final)
2010-11	140.1753	18.01.11	140.1753	88.7213 (Final)
2011-12	169.89101	26.08. 11 04.06.12	166.021005 3.87	120.2379 (Final)
Addl. APO 2011-12	6.20	04.06.12	6.20	0
2012-13	265.26933	03.12.12	205.8244	149.82
2013-14	214.0058	01.07.2014	180.00	39.31(Upto 12/2014)
Addl. APO 2013-14	50.674435		0	0
Total			**833.152505**	**522.2095**

Source: Annual Activity Report- 2014-15, Forest and Environment Department, Govt. of Odisha

From the above table, the underutilisation of funds vis-a-vis funds received from Ad-hoc CAMPA can be observed. It clearly speaks out that a significant amount has remained unspent. This indicates poor planning & inefficient execution by State CAMPA and Forest department as well. Underutilisation of funds raises concerns on states absorptive capacity of the State Forest departments. The official's plea that structural and bureaucratic bottlenecks, delay are the reasons need reforms for effective utilisation of the amounts.

A GRASSROOTS REALITY

As per the rule MCL has deposited rupees 702526300/- to central CAMPA fund through the State Government for different project in Angul district. The detail is given bellow.

Table No. 7.4: Receipt of NPV and other deposits from MCL in different projects in Angul Division

Receipt of NPV and other deposits from MCL in different projects in Angul Division												
			Amount Received (In Rs.)									
Sl. No.	Category	Name of the Project	N.P.V.	C.A.	Addl C.A.	P.C.A	S.Z	1.5 times Of S.Z.	CATP	Wildlife Mange-ment	Others	Total
1	Mining	Natraj Under Ground Coal Mines of MCL	0	383299		0	0	0	0	0	0	383299
			133333760	0		0	0	0	0	0	0	133333760
			0	161201		0	0	0	0	0	0	161201
2	Mining	Hingula OCP of MCL	1447500	111920		0	0	0	0	0	0	1559420
3	Mining	Kaniha OCP of MCL	1730250	0		0	0	0	0	0	0	1730250
			5718820	0		0	0	0	0	0	0	5718820
4	Mining	Bhubaneswari OCP by MCL	84390750	0		0	0	0	0	0	0	84390750
			0	0		0	2588100	2240200	0	0	0	2828300
			5664987	0		0	0	0	0	0	0	5664987
5	Mining	Ananta Extention OCP by MCL	47002500									47002500
			985500									985500
6	Mining	Ananta OCP by M/s MCL	70224993	0		0	0	0	0	0	0	70224993
7	Mining	Jagananth Extn. OCP by MCL	53448320	0		0	0	0	0	0	0	53448320
			2503200	0		0	0	0	0	0	0	2503200
			1043	0	0	0	0	0	0	0	0	1043
8	Mining	Nandira U/G Mines by MCL	149674800	0		4261383	0	0	0	0	3836000	157772183
			0	0		1905417	0	0	0	0	2014000	3919417
9	Mining	Bharatpur OCP by M/s MCL	92366900	0		0	0	0	0	0	0	92366900
10	Mining	Chhendipada OCP by M/s MCL	7574600	0		0	0	0	0	0	0	7574600
11	Mining	Handidhua Mining Lease by MCL	22110240	0		0	0	0	0	0	0	22110240
12	Mining	Deulabeda Minning Lease by MCL	144905	0		0	0	0	0	0	0	144905
13	Angul	Rediversion of 0.81 ha. Forest land for construction of alternte coal transport road from Dera Chhak to NH 200 by M/s MCL Ltd.	507010	0	0	0	0	0	0	0	0	507010
14	Road & Bridges	Widening of existing road from Hingula OCP to Railway siding of Kalinga area of MCL	0	0		23600	0	0	0	0	0	23600
15	Railway	Construction of Railway Tract linkage from existing MGR of STPP Kanhia to Kanihia OCP of MCL	6540000	406000		0	0	0	0	0	0	6946000
			0	170500		0	0	0	0	0	0	170500
			931500	0		0	0	0	0	0	0	931500
			0	87100		0	0	0	0	0	0	87100
16	Railway	Construction of Railway Line from Kalinga OCP, Talcher to Angul Railway Station by GM Hingua area MCL									36002	36002
		Grand Total	**686301578**	**1320020**	**0**	**6190400**	**2588100**	**240200**	**0**	**0**	**5886002**	**702526300**

Source: MOEF, Govt. of Odisha

To carry out the afforestation programme in Angul forest division the Divisional Forest office used to submit an outlay to the State department of Environment and Forest. And whatever money they receive they used to carry out different activities with that money within that financial year. The detail activities carried out by utilising CAMPA fund in Angul Forest Division since 2009 is explained in Annexure-III. The financial details and its utilization given in

table no 7.5 shows that in last five years the Angul forest division has received around 167412000 rupees from State CAMPA fund. However, in the case of expenditure it reflects that it has spent only 153910240 rupees till the end of November,2014.

Table No 7.5: Statement of Funds Received and Expenditure incurred under CAMPA APO 2009-1 to 2013-14 in Angul division (up to 11/14)

APO	Pr.C.C.F. Odisha			Pr.C.C.F. (WI)		
	Outlay	Funds receive	Expenditure incurred	Outlay	Funds receive	Expenditure incurred
2009-10	41464686	16106000	15954953	2675000	2675000	1775000
2010-11	30938100	29550000	29550000	155000	1550000	1550000
2011-12	35738111	35560000	34203655	3110000	3110000	3110000
2012-13	51000460	46806000	42679758	9560000	9560000	9447820
2013-14	41512448	14260000	9917194	12970000	8235000	5721860
Total	**200653805**	**142282000**	**132305560**	**28470000**	**25130000**	**21604680**

Source: DFO Office Angul

The Forest dept. has a significant role in terms of utilising CAMPA fund. The allotted CAMPA fund meant for utilisation is done. The official also said that they have undertaken following activities from CAMPA fund in Talcher area like dug 4 water bodies, solar fencing 25kms area, plantation of trees, appointment of field level officials, construction of quarters meant for field officials, training to officers etc. But these activities were undertaken in the forest and it's periphery areas. It reflects that the activities carried out just to utilise the fund not to ecologically restore the mining affected areas. More than 95% of the villagers claimed that forest department did not organize any program related to wild life conservation and afforestation in the area. The Gram Sabha in almost all the villages have not taken any step which would force the forest department to plant trees in the affected areas.

As per overarching objectives and core principles of the State CAMPA guidelines, the State CAMPA was also to promote a voluntary movement of youth and students for supporting on going conservation activities and new activities initiated in the State Forest Department. But the fact remains that no such activities have been undertaken by forest department in the district level. And it reflects the ignorance and creating question on their sincerity. Though field level

staffs have been recruited contractual basis to meet shortage of personnel but they are working in the range office.

It can be said that the absence of NGOs, passive role of Gram Sabha and administration is not at all a good sign for the future generation in the affected villages. Therefore steps should be taken by the concerned people to ensure that Gram Sabha, administration take a proactive role in the development of the people. For balanced development and sustainability it is necessary that the administration and the people work in hand in hand. Government should ensure that not only they earn huge revenue but not at the cost of the poor people in the state of Odisha.

8. SUMMARY AND CONCLUSION

Coal is recognized as the main source for energy for many decades and contributes to nearly 27% of the world commercial energy requirement. It is one of the core industries that contribute to the economic development of India. Literature reviewed reflected that exploitation of coal through opencast and underground mining has caused a wide range of socio-economic and environmental problems such as health, air, water and noise pollution, decline in agricultural productivity, deforestation and displacement. However, over the years, stakeholders involved in the industry have been endeavoring to avoid and mitigate the potential adverse effects of mining on fragile ecosystems and local communities. Both the State and Central Governments are increasingly formulating and adopting policies to ensure the sustainable development of the mining industries and mining companies are striving to be better environmental friendly. Environmental groups have become increasingly involved in mining disputes. However, a lot needs to be done to ensure that mining is carried out in a more sustainable way with minimizing the environmental costs that disturbs the local livelihoods and biodiversity.

The present study concentrates on the socio-economic and environmental effects of coal mining in the Talcher coalfield of MCL, Odisha. While focusing on impact emphasis was given on livelihoods, health and local biodiversity. Role of various institutions and mining companies on ecological restoration and reclamation was also focused.

To attain the objectives of the study six mining affected villages and two control villages were selected. A total of 75 Households based on ethnic composition were selected for enumeration from each of the villages. Thus a total of 600 such households were the sample for the study. Data collected were both qualitative and quantitative based on household surveys and interview and the same was analyzed using SPSS and content analysis. Discussions were organized with public and other stakeholders. Corporate Social Responsibility activities of Mahanadi Coalfields Limited were assessed from the company as well as the villagers. Based on the analysis and observations it can be implicated that mining has a mixed impact on the people's standard of living. Though after displacement economic gain of the villagers have increased exponentially

with diversified employment and business opportunities as compared to the control villages but the challenges outnumbers the economic gains.

Displacement in the mining villages has led to conflicts in the family system. The joint family system in the affected villages is in its skeleton or nominal form. The displaced villagers are having lucrative jobs or have gone out of their villages, ensuing from the availability of better opportunities elsewhere as well as the rising pressure of population on the limited land base. During field investigation in the mining affected areas, it was observed that in most cases, if there are two brothers in a family, they tend to form two independent families even within the same household owing to the rising spirit of individualism, regardless of similarity in occupation, even when the ancestral property is not formally partitioned at their native place. In few cases it was observed that the old parents were neglected by their children who got job on compensatory ground. Though it is clearly mentioned in MCL job offer letter that if a son neglect his parents action will be taken on him but due to lack of voice few old parents failed to draw the attention of MCL authorities. Loss of agriculture and forest based resources has brought a loss to social relation and traditional rituals and customs.

The economic gain of the people in the villages has increased but the economic gains have brought unprecedented loss in the context of social structure, social capital, family, kinship and caste structure. The young age villagers are reluctant to continue their life in the village and therefore do not care for their old age parents and they are left out in their poor condition. The old people's lives are left to the mercy of god and they either sell coal or work as labor to survive. The old aged villagers who were once happy and satisfied with the life they had before the mining intervention are now cursing their own fate.

A new contractor class of people has risen in the affected villages. The contractors are having proximity with MCL authorities and it was observed that a large number of landless villagers as well as few elite groups of villagers are seen running behind the contractors for getting non-agricultural occupation. The contractors are also seen as a vote bank as they are having a large number of people under their control. Villagers report that at the time of different Panchayat and general elections the contractor class people are seen wooed by different political parties as they

have numerical strength in the villages and also having political connections outside of the villages.

Mining has also affected the traditional Jajmani relation as money economy has replaced the concept of grains, land, agriculture etc.

Mining project has created jobs, increased the standard of living and has increased the demands of goods and services in the remote and impoverished villages of Talcher area but there are serious repercussions which the villagers are facing in the form of environment pollution and health. All the open cast mines in the villages have contributed to the air, water and noise pollution. The associated activities with the open cast mines such unloading and loading of coal, transportation of coal, air emissions, poor condition of roads and huge quantities of open air coal burning by the villagers are responsible for air pollution.

The most significant impact of a mining project is its effects on water quality and availability of water resources within the project area. It raises a question on sustainability of water resources and its source. Whether surface and ground water supplies will remain fit for human consumption, and whether the quality of surface waters in the project area will remain adequate to support native aquatic life and terrestrial wildlife. The soil and sediment eroding into and degrading surface water quality is a serious problem.

The extraction of mining has reduced the water table. Especially in summer season the villagers are facing lots of problem in getting safe drinking water. The water supplied by MCL can serve the problems of human but the concern will rise for animals and birds who depend on surface water for their survival. As part of conservation of water resources, MCL officials reveal that the consumption of ground water by MCL is quite low as compared to other industrial activities. It is more depending on surface water. As part of measuring the water table, MCL has installed 23 Piezo meters to monitor the water table.

The data from SPBC, Bhubaneswar shows that suspended sediments and COD in most of the mining areas and BOD in few cases have crossed the specified standard. Aquatic life will be

disturbed due to reduction in photosynthesis, high suspended sediments, COD and BOD. Drainage of mine water to various stream and rivers have affected the aquatic life. However, the recent initiative called 'Zero Discharge' undertaken by MCL is a major step towards combating the water pollution. It will solve all most all the water pollution problems in course of time.

Some scholars working on water pollution show their concern relating to use of fly ashes in filling up abandoned mines and its high leaching potential. However, the Committee constituted by Hon'ble National Green Tribunal (2015) has analyzed the ground water samples and ash samples collected near the ash disposal sites of Angul and Talcher areas reported that the water quality was within the BIS standards apart from the concentration of iron at 15 sampling locations. The ash which is currently being disposed in the abandoned quarries of South Balanda and Jagarnnath OCP has just started; an extensive study of its leeching behaviour is required, which is beyond the scope of this work.

The development of coal mines has led to the loss of forest cover and simultaneously affected biodiversity and wildlife corridors in these forest areas. According to the Ministry of Coal (MoC), about 60% of coal resources are located in the forest areas (MoC, 2005). Most coal blocks allocated in the last few years have been in or adjoining forest areas. In Angul-Talcher region in Odisha, for instance, forest cover has reduced by 11% between 1973 and 2007 due to coal mining (Singh P., 2010). Along with MCL the rise of other industries like Nalco, NTPC, Zindal, Bhusan, etc has brought a loos to the forest land in this region.

Mining has affected the local environment and associated biota through the removal of vegetation and topsoil, the displacement of fauna, the release of pollutants, and the generation of noise. The overburden of coal mines when dumped in un mined areas creates mine spoils which ultimately affects the surrounding vegetation.

The destruction of ecosystem in post mining period has brought a great loss to the wildlife and their habitat. Both directly and indirectly it has damaged the wildlife. Animals live in communities that depend on each other. Survival of these species depends on local ecosystem, soil conditions, local climate, altitude, and other features of the local habitat. The impacts stem primarily from disturbing, removing, and redistributing the land surface. Some impacts are short-

term and confined to the mine site; others may have far-reaching, long-term effects. The most direct effect on wildlife is destruction or displacement of species in areas of excavation and heaping of mine wastes. As per villagers view most of the wildlife species are extinct. Mobile wildlife species, like game animals, birds, and predators have left these areas. More sedentary animals, like invertebrates, many reptiles, burrowing rodents, and small mammals are severely affected.

The development of mining projects that destroys vegetation near ponds, reservoirs, reduces the quality and quantity of habitat essential for waterfowl, shore birds, and many terrestrial species. The loss of habitat requirements for many animals did not permit them to adjust to changes created by land disturbance. These changes reduce wildlife. The fragmentation of habitats due to mining activities has made difficult for some animals for their ecological move. In some cases the isolation has led to local decline of species, or genetic effects such as inbreeding. Species that require large patches of forest simply disappeared. Understanding the problem of ecosystem destruction MCL has set up an eco-restoration site in Balanda covering around 200 hectares of land. It has practiced there tree plantation for ecological restoration of degraded lands.

During field study it was observed that abandoned mines which are present near Anantapur Mines and near Jambubahali village has become a challenge for the environment and also a menace for the villagers. Though MCL has taken lots of initiation to biologically reclaim the mined areas, but it is not reached with a proper solution due to certain technical problems. Firstly while extracting coal there is certain short fall of soil quantity and proper reclamation of dump area not being practiced. In the abandoned mines the top soil is not being whether progressively or concurrently utilised for its reclamation which is making the environment degradable as it has become a dumping ground. As per the rules of mining closure act for successful biological reclamation of the abandoned mines the area should be planted with nitrogen fixing tree species or fruit bearing tree species and endemic and mixed culture. No doubt MCL has planted many plants as per the mining closer policies, but due to lack of monitoring mechanisms most of the plants are dead and also the villagers are not much aware about it.

It is mentioned in mining closer policy that unless and until a mining company has ecologically reclaimed the abandoned mining, no further extraction will be allowed. Even it is mentioned that both the extraction and back filling of extracted areas will move simultaneously. However, till now any back filling activities are not done for Bharatpur South Quarry abandon mining areas. During our interaction with officials it was observed that an agreement is held between MCL and NALCO to fill this quarry with fly ash of NALCO. As an initiation from NALCO the lean slurry transportation system (pipeline) for mine void filling at Bharatpur South Quarry is in advanced stage of construction. Pipeline of 15 km has already been laid down.

The data collected from MCL reflect that MCL has taken some serious steps in reclaiming the de-coaled lands. While the major portion of the lands (64.36%) are technically reclaimed, only 37% of area to be backfilled is technically and biologically reclaimed. Lack of sufficient land has created a problem for MCL to store the OB Dump and top soil. The practical problem faced by the MCL is that while excavating the coal there is certain shortfall of soil quantity held, which make it difficult to arrange soil for backfilling. Though MCL has shown its seriousness in planting trees in OB dump areas, the density of plantation is less and the quantity of fruit bearing plants are also less in number.

Noise pollution is one of the leading nuisances generated by the mining activities. The noise pollution occurs due to the noise by the vehicles, bulldozers and excavators. Our Personal observation during fieldwork reflects that the sound pollution is mostly due to transportation of heavy vehicles. Though 81% households claim that some crack has appeared in their houses, but not all the cracks are the recent one. MCL has taken lots of step to control sound pollution by using blast less technology, fixing of time of blasting, giving prior information of blasting to villagers, blasting time is very much limited and its effect is minimised by use of electronic delay detonators. It was noticed that the company is providing sufficient hearing protection materials (ear plugs and ear muffs) to operators and workers to reduce health hazards from noise. However, the impact of blasting on house cracking cannot be completely ignored.

Displacement of the villagers has brought a big transition in the quality of life especially from the point of view of health. In the pre mining period when the villagers had full access to forest, agriculture their health and nutrition were better off as compared to the present scenario. The

diversity of crops which were grown by the villagers earlier as well as the forest products such as roots, fruits, traditional herbs provided balanced nutrition to the villagers but in the contemporary times access to forests, nutrition, and fruits has been blocked completely.

Villager's health condition has deteriorated a lot. Villagers who are living in the vicinity of coal mines are the worst affected. Direct Inhaling of air pollutants have given rise to asthma attacks, respiratory infection and changes in lung function. The cases of suffering from asthma and respiratory toxicities have increased in comparison to pre mining and control villages. The frequency of diseases suffered by the villagers has increased manifold times. Mining pollutants is the sole reason for the occurrence of fatal diseases. Women have direct contact with water sources for performing household's activities such as washing clothes, bathing children and collecting water which has resulted in marked irritation in the skin, respiratory tract, nasal ulcers, pneumonia. Children had white sores and white marks all over the body

Though MCL has organized lots of events to create awareness among villagers, but it has not succeeded in educating the mass regarding the harsh impacts of air borne diseases. Though MCL is providing free medical facilities, these are restricted to their employees and their family members only. In this situation poor unemployed households are the worst sufferers. They have neither a job nor having free medical facilities.
This data collected from field visualizes that due to mining the direct cost of medical expenditure has increased as compared to pre mining and control villages

Impact on human capital is conspicuous. Mining has broadened the path for employment and has also raised the standard of living but people are suffering from major health problems encountered by the residents over there are varieties of skin diseases, fever including malaria, gastritis, asthma, gynecological problems and TB. Eye allergy and eye irritation are also the frequently occurring diseases over there.

Prior to the introduction of mining projects the entire occupational scenario of the affected villages was agro-based. The forest resources were also another major source of income for them but with the introduction of mining projects agriculture which was a major source of

livelihood has been completely replaced by non-farm activities. The loss of biodiversity due to pollution and mining activities has disturbed livelihood pattern of mining affected villagers.

The source of incomes is only mining centric after the post mining period. The diversified source of income has lost its importance in post mining period. The assured source of income from mining sector has increased the purchasing and investing capacity of the villagers. There are different types of business in the mining villages. While some have rented out their tractors and vans, some run hotels, pan shops, grocery shops and cycle repair shops, and some are engaged in the vegetable business. Some households in the mining villages have indulged in income-generating activities such as drivers, helpers in tractors, tailors, blacksmiths, barbers, contractors, etc. In terms of financial capital mining has a positive impact.

Mining also has a mixed impact on social capital. Mining activities have changed the existing scenario and social equation. Traditionally in the village administration, caste was strong factors. With the advent of mining the scenario is changing fast. Since caste has no role to play in the mining activities, people of lower caste are also becoming rich which upsets the elite in the village. The dominance of caste in society is now being replaced by neo-rich class. This changed equation is now leading to tension in the mining village. This phenomenon was less visible in the control villages.

Displacement has interrupted the social networks of the mining affected communities. MCL has not only displaced the mass from their own traditional lands but has also relocated in alien environments. Villagers often feel insecure and they only contemplate about their individual identity and well-being rather than the community as a whole.

There is no cohesion and unity in terms of celebrating festivals and other community functions. Due to the scope of employment opportunities number of both educated and uneducated masses from various states are migrating to this region to avail the opportunity. The in migration has affected the cultural amalgamation which has ruined the ethnic identity.

Most of the displaced communities are finding it difficult to construct new houses by investing the monetary compensation. As the market price is very high and the compensation provided to

them is not at all sufficient to construct houses. In this regard the condition of landless villagers is very deplorable as they have not received any significant compensation to build new houses. Natural capital such as air, water has been the worst affected due to mining emissions and pollution.

The policy on CSR of MCL is framed so as to take account into the welfare measures for the community at large so as to ensure the poorer section of the society deprived the maximum benefits. The policy also aims at taking care of the landless and the project affected persons. Proper rehabilitation of the displace persons based on R&R policy. Besides this the policy also aims to contribute to the society at large by way of social and cultural development , imparting education, training and social awareness especially with regard to the economically backward class for their development and generation of income to avoid any liability of employment.

The scope and description of CSR covers education, water supply, health care and organizing health awareness camps, environment, social empowerment, electricity, generation of employment and infrastructure support. From the detailed analysis it is clear that the overall CSR expenditure in last four years with regard to environment sector which is highly affected due to mining activities is ignored to a great extent. Majority of the expenditure of CSR is invested in providing safe drinking water to the villagers. As a part of health care, MCL has initiated a project of around 290 crores to set up a medical college at Talcher.

For the welfare of animals MCL do not has any robust CSR policies and planning under their sleeves. The skill up gradation training programs of MCL is not so effective. In the field, it was found that in most of the villages, the new comers were not given adequate skill up gradation and training programs. As a recent initiative of skill upgradation it has made collaboration with 3/4 ITIs. Though MCL is more keen to spend the CSR amount for the community development, due to lack of administrative support and local political conflicts, infrastructure projects are not properly implemented.

The CSR activities carried out in studied areas implicated that wherever the local leaders are influential they got benefited and more CSR activities are therefore implemented. Only in those

villages where the public representatives were dynamic and had a kind of political matureness and lobby were successful in bringing projects under CSR.

The functioning of different institutions such as NGOs, Gram Sabha is far from the satisfactory level. In the study villages not a single NGO was found working with the people .It was quite perplexing that the villagers did not knew about the concept of NGOs and their functioning. There are number of issues related to people in the villages ranging from issues related to health, environment, wages, safety, pure water, electricity and displacement. It would have been better if any NGO would have been working for taking up genuine issues of the villagers in the forefront.

There are numbers of work which are undone in the affected and rehabilitation colony ranging from strengthening of community-based organizations and construction of houses, providing infrastructure, maintaining infrastructure such as wells or public toilets and solid waste collection services and pacifying number of conflicts between villagers and MCL. NGOs could have played an important role if it would have been present.

Gram Sabha and Gram Panchayats head have been accused by the villagers of making nexus with the MCL. They are constantly lured by the mining companies. In most of the villages the Gram Panchayat also failed to take the issues to the upper level. Though, in the initial phase of mining these rural institutions played a pivotal role but later on remain silent.

Villagers have been deprived of number of Government welfare schemes and measures such as BPL card, Indira Awas, Job card, old age pensions and there are no credible institutions which could make attempt in delivering benefits to the villagers. Old age people who have been left at the mercy of their fate are the worst affected and requires immediate help from these institutions.

The forest officials working in Angul division are more vibrant in spending CAMPA funds and organising different activities like plantation. Though officials have done lots of plantation activities under CAMPA fund, they failed in taking the people into confidence. Even whatever plantation details under CAMPA was found shows that it did not cover the affected areas. They have planted some trees as per the convenient of the forest department. As per overarching

objectives and core principles of the State CAMPA guidelines, the State CAMPA was also to promote a voluntary movement of youth and students for supporting on going conservation activities and new activities initiated in the State Forest Department. But the fact remains that no such activities have been undertaken by forest department in the district level. Though field level staffs have been recruited contractual basis to meet shortage of personnel but they are working in the range office.

The tribal department was also seen inactive in the study areas. The district pollution control board is not playing any role. They have never visited the villages' and the people of mining villages are unaware of what a pollution control board is. Only in few villages some machines are set up to calculate the air pollution, but in reality no body aware about the reliability of those machines.

CONCLUSION

From the above findings it can be concluded that mining has both positive and negative impact on the people's way of living. No doubt it has brought lots of economic gain, at the same time social and environmental cost should not be ignored. While in one hand, with the introduction of mining the economic standards of the people has increased as they have better opportunities to work. Their annual income is higher than the annual income of the people of control villages and also pre- mining period. But on the other hand, they are staying in highly polluted environment and suffer from diseases directly related to mining and so on. Along with pollution the pain of displacement has ruined their life and livelihood. Though MCL has constructed schools, health centres, clubs, they are mostly meant for their employees. The impact on biodiversity, agriculture and health sector is equally negative. At this juncture, improvement in the overall condition of the environment and the quality of life should be the prime responsibility of the mining company. The approaches adopted by MCL should be reasoned based.

Before the onset of mining, agriculture and forestry were the primary source of income for the people of this area. With the intervention of mining, both the forest and agricultural land has been acquired by the MCL. Though, land-owners were compensated to some extent, the landless people became victimised. During pre-mining period they used to earn their livelihood by working in the land of the other people but in the changed situation they have neither a

compensated job in mine nor the agricultural land of other people to work. So this section has become most vulnerable in post mining period.

All most all the villagers in mining affected areas have lost agricultural land. Though few households are having few dismals of land, they are not regularly engaged in agricultural activities. As cost of agriculture has increased due to rise of labour cost, loss of productivity, water crises, land holding households have lost their interest. Even if you compare the production details the production of control villages at similar investment is much higher than the production of mining villages. This is due to the fact that land of the mining villages is covered with the coal dusts, which makes the land infertile leading to lesser production. The intervention of mining has posed a serious question on sustainable livelihoods. As all most all are depending on mining and allied areas for their survival, what will happen once the mining activities are over in these areas. Do the villagers will get back their traditional source of income? When MCL is facing lots of technical problems in ecologically reclamation of abandon mining areas then to what extent it will give back those lands to the villagers making it agriculturally fit.

The destruction of ecosystem and habitats has brought a question mark on sustainability of wildlife. By living and working in the mining villages, people suffer from fever, TB and skin diseases etc. However, the incidences of these diseases are not noticed in the control villages. Though, to control this, MCL has opened health centres in some areas, the benefits of these are only open to the employees of MCL. The non-employees have to depend upon the services of government hospitals of remote areas or go to private doctors, which is more expensive.

The rise of SPM and RPM is really major issue in all most all the mining areas of Talcher. Even the rise of SS, COD and partially BOD has created problem for aquatic life. The continuation of noise problem has created a major threat for the villagers. Proper monitoring of the MCL which calls itself a “trend setter” in controlling pollution should be undertaken and stringent action should be taken against it. However, the recent initiative called ‘Zero Discharge’ undertaken by MCL is a major step towards combating the water pollution. It will solve all most all the water pollution problems in course of time.

The benefits of the project should be equally shared by MCL and proper attention to non - employees should be given in this regard. MCL should take steps to unite and integrate the community and not to bi-furcate the community for its benefit. The health policies should be all accommodating for both employees as well as non- employees and those with no land or any asset. Women and children's health should be given priority as children and women are most vulnerable and affected by mining pollution.

The introduction of mining has disturbed the age old social structures. Customs, rituals, caste and kin based relations, which are quite prevalent in control villages. As part of CSR activities MCL has not done much as per the requirement of villagers. It became very area specifics, where people and Sarapanch are influential and having voice. Though it has brought a great loss to the local environment, its activity report reflect that as part of CSR activities environment aspect is mostly ignored. Even the social development aspect is not much emphasised. Instead of emphasiing much infrastructural set up, it should give much emphasis on providing livelihood based skilled development training to the villagers.

The role of various institutions in ecological restoration and reclamation shows that all most all the rural institutions are quite inactive in case of ecological restoration. Though, Gram Panchayat was playing a pivotal rule in the initial phase of mining in mobilising the villagers, but it remains silent in later course. Though, there are huge scope for NGO to work, the absence of NGO in this area is quite surprising. Though CAMPA funds are utilised by the divisional forest officials, the ignorance of people's voice has put a question mark on sustainability of plantations.

In the era of globalization sustainable development requires an appropriate balance between social, economic and environmental well-being, now and for the future. As most of the minerals are non-renewable resources, sustainability of supply can only be addressed by extracting, processing and distributing raw materials in the least environmentally damaging ways and recycling as much as possible. Sustainable mining should balance economic growth and protection of the environment by taking into account all benefits and costs. In case of India closing the mines is not an immediate option. There is a need to bring a balance between economic gain and environmental loss to ensure greater sustainability of the local communities. Keeping in view the need for combating global warming and climate change the country should try for different policy options for an environmentally clean and energy secure future.

RECOMMENDATION

(a) Both the land acquisition and land possession activities should carry out simultaneously and all disputes should be resolved as soon as possible in consultation with public. Giving much time gape between land acquisition and land possession giving an opportunity to the villagers to go for agitation in future.

(b) Rehabilitation and Compensation issues should be dealt with equitably. The company should provide all infrastructure facilities to the rehabilitation colony. They should take into consideration the plight of landless households. They should give much emphasis on rehabilitation rather resettlement.

(c) Issues of post-mine closure like unemployment, income potential, migration, environmental clean-up should be discussed and taken care much in advance.

(d) Higher administration should look into the effective utilization of CAMPA fund in the affected villages.

(e) A proper monitoring mechanism should be developed by the MCL to monitor the negative impact of mining activities and proper implementation of its policy guidelines including CSR, mining closer, R&R, environmental protection, etc.

(f) To create a healthy environment for industrial promotion regular interface among villagers and industry should be organised.

(g) To strictly implement the mining closer plan, the Government should act more vibrantly and try to resolve all the technical issues if companies are facing to close the mining.

(h) Government departments working in grass root levels should monitor the CSR activities of the companies and should give suitable advices to them wherever required.

(i) Pollution control board should more vigilant and should take the public opinion regularly in the context of pollution.

(j) Providing mobile dispensary to surrounding villages on a regular basis; appointment of village health workers in surrounding villages; project to tackle the issue of fluoride problem; Periodic specialist camps, e.g. Eye, ENT etc; and other sanitation programs should be taken care.

(k) Different mines are given the EC for the certain land areas. However, the owner is same MCL. If cluster wise EC will be given they can maintain EMP.

(l) State Government should assure local administrative support to MCL for quick implementation of CSR activities. Government should organise all stakeholders meeting continuously to need the demands of people.

(m) Provisions should be made for a buffer zone between the local habitation and the mine lease in the form of a green belt of suitable depth. Restricted entry, use of sirens and cordoning of the blasting area are some of the good practices to avoid accidents.

(n) An initiation should be taken from both State Government and MCL side to neutralise the local conflict and formed various local level committee to select the demand of the villagers.

(o) Possibility may be find out for mechanical covering of coal loaded tippers.

(p) NGOs should be promoted for working in this region in accordance with MCL.

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ANNUXURE-I

Progressive Backfilling Status in MCL as on 31/03/2014

Sl. No.	Project	Area Excavated (in ha.)	Area De-coaled (in ha.)	Volume of OB generated (in Mm3)	Volume of OB as external dump (in Mm3	Area of external OB dump (in ha.)	Area of External OB dump biologically reclaimed (in ha.)	Volume of OB backfilled (in Mm3)	De-coaled area having road, infrastructure & others including space left for safety purpose that cannot be backfilled presently (in ha.)	De-coaled Area used as/left for reservoir (in ha.)	Area to be backfilled (in ha.)	Area Already backfilled (in ha)	Area backfilled and technically reclaimed upto GL (in ha.)	Area backfilled but not technically reclaimed upto GL (in ha.)	Area backfilled technically and biologically reclaimed (in ha.)	Lag in backfilling area (in ha.)
1	2	3	4	5	6	7	8	9	10	11	12=4-10-11	13	14	15=13-14	16	17=12-14
1	Lingaraj	254.32	107.03	108.44	40.35	107.51	65.09	68.09	15.40	10.12	81.51	81.51	20.60	60.91	20.60	60.91
2	Kaniha	36.42	0.00	2.71	2.76	17.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Balaram	438.00	390.36	129.65	10.28	50.82	25.60	119.37	40.27	38.00	312.09	289.79	255.00	43.79	76.94	57.09
4	Hingula	261.19	176.17	29.84	6.22	16.59	11.92	23.62	15.70	25.18	135.29	114.17	56.20	57.97	2.00	79.09
5	Bharatpur	387.81	369.97	126.64	9.22	49.50	30.46	117.42	37.21	12.00	320.76	296.34	188.04	108.30	107.93	132.72
6	Chhendipada	14.00	8.00	1.958	0.42	3.00	0.20	1.404	1.00	1.35	5.65	4.00	1.70	2.30	0.00	3.95
7	Ananta	367.00	340.00	112.68	1.96	10.80	10.80	110.72	85.00	50.00	205.00	207.00	97.70	109.30	66.90	107.30
8	Jagannath	323.50	309.27	76.78	5.51	36.46	29.20	71.27	41.75	50.00	217.52	199.65	199.65	0.00	129.15	17.87
9	Bhubaneswari	184.38	56.73	45.16	28.49	66.43	0.00	16.67	7.20	12.00	37.53	33.14	12.60	20.54	0.00	24.93
10	Balanda	315.00	315.00	112.63	2.60	20.00	20.00	110.03	27.93	6.00	281.07	196.07	196.07	0	196.07	85.00
	Total of TCF	**2581.62**	**2072.53**	**746.488**	**107.81**	**378.51**	**193.27**	**638.594**	**271.46**	**204.65**	**1596.42**	**1430.67**	**1027.56**	**403.11**	**599.59**	**568.86**

Source: MCL, Burla, Head office.

ANNEXURE-II

List of Activities Taken Up For the Year 2008-09 to 2012-2013 by Mahanadi Coalfields Limited in Angul District

List of Activities Taken Up For the Year 2008-09 to 2012-2013 by Mahanadi Coalfields Limited in Angul District			
Year	**Area**	**List of Activities taken up**	**Amounts in Rs Lakh**
2008-09	Jagannath	Various peripheral development works of Angul District through State Authority	60.00
	Jagannath	Water supply to nearby villages by tankers	23.34
	Jagannath	Construction Of Road and Culverts at nearby villages	17.57
	Jagannath	Construction Of Room for Football association at Talcher	6.00
	Jagannath	Misc. Other works in Angul District taken up by Jagannath Area	38.51
	Lingaraj	Supply of water to water scarce village of Talcher	15.88
	Lingaraj	Construction Of additional class room at Women's' college Talcher	5.06
	Lingaraj	Construction Of additional class room at Women's' college Talcher	3.19
	Lingaraj	Improvement / Blacktopping of RD Road	4.74
	Lingaraj	Misc. other works in Angul District taken up by Lingaraj area	25.73
	Total		**200.02**
2009-10	Talcher	2nd installment for execution of 3piped water supply scheme to 19 nos peripheral villages of Talcher Coalfields of MCL	600.00
	Jagannath	Water supply to nearby villages through tankers during summer	47.84
	Jagannath	Construction of Water tank at Angul jail, cold water project at Angul Women's College	4.26
	Jagannath	Construction / renovation of Primary Schools	5.48
	Jagannath	Other Miscellaneous Works	9.29
	Lingaraj	Construction of additional class rooms / boundary walls at different schools, colleges etc.	29.04
	Lingaraj	Water supply to nearby peripheral villages by mobile tanker during summer	41.12
	Lingaraj	Black topping / Road divider/ concrete road etc.	15.46
	Lingaraj	Other Miscellaneous Works taken up by Lingaraj Area	68.57
	Hingula	Supply of Drinking water to surrounding villages by mobile tanker during summer	280.94

	Other Areas	Other miscellaneous Works	111.43
	Total		**1213.43**
2010-11	Jagannath	Grant in aid to different Primary School	8.78
	Jagannath	Water supply to nearby peripheral villages by mobile tanker during summer	47.42
	Jagannath	Eye camp at Regional Hospital	1.59
	Jagannath	Maintenance of village Road	8.68
	Jagannath	Construction of Road in the peripheral village	7.89
	Jagannath	Supply of Ceiling Fans to Talcher College	0.31
	Jagannath	Renovation of Irrigation Well near Railway Station of Talcher	2.13
	Jagannath	Renovation of Rifle Club at Talcher	3.19
	Jagannath	Construction Of Bridge over Bangaru Nala	10.76
	Jagannath	Field Survey Report of Socio Economic studies	1.24
	Bharatpur	Grant in aid to UP High School	7.00
	Bharatpur	Water supply to nearby peripheral villages by mobile tanker during summer	22.54
	Bharatpur	Eye camp	0.10
	Bharatpur	Construction of road in the peripheral village	0.28
	Talcher	Financial Assistance for construction 100 seated ST Girls Hostel, Angul	82.50
	Talcher	Construction of 138 nos. Additional Class room buildings in different School taken up through State Authority in Angul District	564.42
	Talcher	Construction Of 134 nos. of Anganwadi Centres taken up through State Authority in Angul District	833.48
	Talcher	3rd installment for execution of 3piped water supply scheme to 19 nos peripheral villages of Talcher Coalfields of MCL	400.00
	Talcher	Widening & strengthening of Angul-Chhendipada-Sarpal- Budhapal road up to 2 Lane Standard, Angul	1300.00
	Talcher	Water supply to nearby peripheral villages by mobile tanker during summer	27.40
	Talcher	Construction Of Class room in Primary School	1.49
	CWS, Talcher	Grant in aid to different Primary School and Colleges , Talcher, Angul	22.40
	Lingaraj	Misc. works for S R M bldg., Talcher, Angul	3.00
	Lingaraj	Misc. works at Entrance of Talcher Town, Talcher, Angul	0.17
	Lingaraj	Approach Road to bridge over Bangaru Nallah	1.75
	Lingaraj	Sinking of tube well in nearby village	1.14
	Lingaraj	Construction Class room in the Primary School	5.11
	Lingaraj	Widening & strengthening of Public road from Dera Chowk to Handidhua Chowk, Talcher	146.50
	Lingaraj	Providing Furniture for Talcher college	3.00

	Lingaraj	Repairing of Talcher College building, Talcher	3.00
	Lingaraj	Painting works of Talcher College Building	0.89
	Lingaraj	Black topping of road	2.21
	Lingaraj	Construction Of village road	20.13
	Lingaraj	Boundary wall at OWSS	0.25
	Lingaraj	Replacement of AC sheet of Jarda High School	2.04
	Lingaraj	Misc. works on the road at Lingaraj	2.26
	Lingaraj	Construction of Community Hall under Lingaraj	2.73
	Lingaraj	Water supply to nearby peripheral villages by mobile tanker during summer	42.75
	Hingula	Repairing & Maintenance of Community Hall near Hingula Temple	5.76
	Hingula	Water supply to nearby peripheral villages by mobile tanker during summer	105.53
	Hingula	Miscellaneous activities under Hingula Area	2.20
	Hingula	Providing RCC hume pipes in the approach road to village	0.27
	Hingula	Maintenance of Meditation Centre in the village	0.66
	Hingula	Providing of Bore well in the peripheral village	9.10
	Hingula	Construction Of class room in the peripheral village	2.45
	Hingula	Miscellaneous activities under Hingula Area	1.85
	Hingula	Balance work of community centre of Solada	0.91
	Total		**3719.26**
2011-12	Talcher+CWS	Grant in Aid to Schools(UP School Nandira,LWUP school Dera,LWUP School Handidhua,Nilakanteswar Mahavidyalaya, South Balanda,CWS Talcher)	23.26
	Talcher	Water supply to Village (Gurjang, Brajnathpur,Sridiga,Ragunathpur,Arakhapal,Lahundi,Kandhal.)	36.54
	Talcher	Construction of Shamasan Ghat at Village Handidhua	0.55
	Talcher	Construction of additional class room at Bharati High school of village Kankili under PDC	0.89
	Talcher	Misc. Expenditure on Social activities by Talcher Mahila Mandal	1.00
	Talcher	Misc. expenditure (Maa Hingula Badminton Club for Tournament)	0.10
	Talcher	Mahanadi Institute of Medical Science & Research, Talcher.	3.00
	Hingula	Water supply to nearby peripheral villages by mobile tanker during summer	145.20
	Hingula	Washing, painting of Hingula Mahavidyalaya	1.43
	Hingula	Repairing of road from Kalamachhuin - Angul road junction to Jamunali village	2.93
	Hingula	Repair of road from Lakeipasi (Bangura Nallah) to Satyabadipur Sahi of Solada	2.57
	Hingula	Sinking of Deep Bore well along with OH tank and ground water tank (One at Hingula Junior Mahavidyalaya **and** one Danara High School under Hingula Area)	6.22
	Hingula	Construction of New toilets and urinals and Water supply and sanitary system at Hingula Mahavidyalaya near Hingula OCP.	3.13

	Hingula	Providing 2 nos. deep bore wells at Hingula High school and hospital campus of PHC, Kalamachhin	3.75
	Hingula	Repair of existing kuccha road at Puruna Chasa Sahi of village, Solada	0.29
	Hingula	Distempering, painting, water proofing cement painting and improvement of existing school gate of Hingula High school	1.04
	Bharatpur	Construction of Black topped road from "0" point to Lakeipasi village under Bharatpur Area	43.27
	Bharatpur	Construction of concrete road in village Lakeipasi	19.02
	Bharatpur	Construction of Community Hall at Karnapur	4.78
	Bharatpur	Construction of Community Hall at R & R Site Village	1.28
	Bharatpur	Construction of Compound wall of School Building at Karnapur village.	7.14
	Bharatpur	Construction of two Class room of primary School at Karnapur	6.24
	Bharatpur	Development of community hall in village	4.82
	Bharatpur	Health care camp for nearby villages	0.59
	Bharatpur	Construction of Community shed	1.85
	Bharatpur	Construction of one no Arch gate at Kuio Resettlement site village	0.61
	Bharatpur	Repair and of market building at Kuio resettlement site	1.93
	Bharatpur	Construction of school boundary wall at Kuio resettlement village	2.48
	Bharatpur	Repair & Maintenance of Yanjya Mandap in village Lakeipasi	0.19
	Bharatpur	Sinking of one no deep bore well at village Rakash	1.99
	Bharatpur	Supply of water through mobile tanker to villages Padmabatipur, Nuasahi, Wards, Harizen Sahi, & others villages.	44.00
	Bharatpur	Grant in aid to Privately managed Primary School	8.65
	Bharatpur	Water supply by Sinking deep bore well at R&R site	5.69
	Jagannath	Repair of class room at Sri Aurobinda Educational Society, Dera	5.98
	Jagannath	Water Supply arrangement at Villages of Jagannath Area.	76.69
	Jagannath	Development work in Community Hall at Hensmul village	1.05
	Jagannath	Medical Camp at village Rakash & Eye Camp conducted at Regional Hospital Talcher.	3.68
	Jagannath	Misc. expenditure (Annual function at Hemsumal & Lighting works at Talcher Ratha Yatra.)	0.57
	Jagannath	Repair Work of road at Tentuli Village.	2.10
	Jagannath	Repair of road at Munda Bazar near Angul	2.89
	Jagannath	Repair of Gantapada Village Road	6.91
	Jagannath	Development of one tube well at Bagamara Village	0.69
	Jagannath	Construction of Concrete Road at village Balanda	10.26
	Jagannath	Moorum spreading at village Rakash	1.66
	Jagannath	Development work of Polly Sabha ground at village Rakash	1.38
	Jagannath	Economic Survey & Social Cultural Resource Mapping at AOCP.	2.48
	Jagannath	Providing RCC Slab at Community Hall village Dera	3.13

	Jagannath	Release of 4th instalment for execution of 3 nos., Pipe Water Supply Schema for 19 nos. peripheral villages of Talcher coalfields	222.00
	Lingaraj	Construction of Dining Hall at Chitrakut Bazar	8.32
	Lingaraj	Washing & painting of Community Hall at Deulbera village	0.11
	Lingaraj	Widening & strengthening of public road from Dera to Handidhua	16.23
	Lingaraj	Misc. expenditure (Maa Hingula Badminton Club Under Lingaraj area.)	0.15
	Lingaraj	Spraying of water from Gandhi Chhak to Bye-pass road	0.88
	Lingaraj	Sweeping & cleaning of road from Balanda rehabilitation to Rly siding	0.87
	Lingaraj	Widening with geometric improvement to the T-Intersection of the road connecting Handidhua to NH-200	13.18
	Lingaraj	Power supply arrangement from Lingaraj Town ship to police station	0.62
	Lingaraj	Repairing & Maintenance of Road from Handidhua Chhak to Pabitramohan Chhak	0.98
	Lingaraj	Construction of Toilet for Town Police station Barrack, Talcher.	2.46
	Lingaraj	Providing & Fixing high Mast light at Talcher Town.	0.30
	Lingaraj	Water supply to nearby peripheral villages by mobile tanker during summer	78.60
	All areas	Other Misc. works at different areas etc.	55.35
	Total		**905.95**
2012-13	Bharatpur	Supply of water for villagers of Bharatpur area	34.49
	Bharatpur	Construction of one no ground water tank at Lunamati Sahi of Karnapur Village.	0.32
	Bharatpur	Sinking of 3 nos. Deep Borewell with submersible pump at village Jambubahal.	7.21
	Bharatpur	Health camp at different village	0.63
	Bharatpur	Construction of black topped road from "0" point to Lakeipasi village under Bharatpur area.	38.91
	Bharatpur	Construction of community hall at village Karnapur	1.89
	Bharatpur	Construction of one no room for use of SC Community at Kuoi Site for the displaced person of Anantaberni village.	0.51
	Bharatpur	Development of community hall at Kuoi Resettlement site.	1.92
	Bharatpur	Construction of community centre at village Jambubahal.	1.86
	Bharatpur	Repair of Badasinghada UP School at village Badasinghada	1.58
	Bharatpur	Construction of drain from PO's office to back to katta pond of village Badasinghada.	5.41
	Bharatpur	Construction of Kotha Ghara (3 rooms) at Kuio Resettlement site for the displaced person of Anantaberni village.	5.81
	Bharatpur	Construction of Dola Mandap at village Karnapur.	3.47
	Bharatpur	Construction of Concrete drain from Jammu Chhak to village pond.	6.47
	Bharatpur	Renovation of existing Masonary drain from Tarini Mandap to Bhaga pond of village Badsinghada.	11.39
	Bharatpur	Construction of toilet cum bath room bolck at Kandhabereni Asram School.	5.15
	Bharatpur	Construction of Boundry wall and gate at Karnapur School.	2.25
	Bharatpur	Construction of two nos class room for Sarsawasti Sisumandir at Chhendipada OCP (Karnpur village.)	1.40
	Bharatpur	Fixing of light, fitting on pole for street light at village Karnapur.	0.69

	Bharatpur	Excavation of pond at Karnapur Village.	1.38
	Bharatpur	Completion internal wiring by PVC conduit of Singhada School.	1.04
	Hingula	Filling of earth in the stage at the premises (back) of Hingula High School near BOCP.	0.22
	Hingula	Construction of Pucca drain at village Danara from Panchayat office to existing culvert at BOCP under Hingula.	3.85
	Hingula	Water supply to villages of Hingula Area.	132.89
	Hingula	Repairing and Strengthening of culvert between village Bhalugadia and Kanrei.	4.47
	Hingula	Construction of 4 nos. bathing steps at Singharajora near Belbaniasahi of Banabaspur Old Basti.	3.26
	Hingula	Erection of Tent for the purpose of meeting with village representative.	0.45
	Hingula	Erection of Oh line & internal electrification of Hingula Mahavidyalaya.	1.99
	Hingula	Providing Tent alongwith cloth ceiling and gate, banner flower Docoration etc.	1.87
	Hingula	Miscellenous repair & maintenance at water supply distribution work etc. during Maa Hingula yatra.	2.04
	Hingula	Development of area inside Hingula Mandir premises by filling earth.	0.58
	Hingula	Providing PVC water storage tank alongwith pipe line from the newly constructed Bore Well at Mallibandha by HOCP.	0.53
	Hingula	Painting & Maintenance of Maa Hingula temple by HOCP of Hingula.	2.16
	Hingula	Sprinkling of water on different roads and provision of drinking water in the event of Maa Hingula yatra.	0.88
	Hingula	Lighting & illumination of Ubhasthali and its peripherial as per requirement of Hingula yatra, april, 2012.	0.81
	Hingula	Daily cleaning of temple premises alongwith disposal of garbage during Hingula yatra.	1.44
	Hingula	Providing Borewell for permanent drinking water and 4 nos.RCC water tanker including its platform for village Kumunda.	0.12
	Hingula	Black topping of both side approaches of dumpha Nallah Bridge under Hingula area.	10.63
	Hingula	Connection of pipe line from Borewell at Hingula High School.	0.32
	Hingula	Costruction of comound wall & cement concrete road of soloda.	3.49
	Hingula	Deep Borewel at Jamunali village.	3.12
	Hingula	Deep Bore well at Badajorada under Hingula Area.	2.59
	Hingula	Deepening of existing pond behind Danara High School.	3.75
	Hingula	Development works at up School, Ambapal.	1.86
	Hingula	Distempering,Painting,water proof cement at Hingula High School.	0.08
	Hingula	Donation for district cultural programme.	3.00
	Hingula	Platform for well at Jamunali village.	1.30
	Hingula	Repairing of Kutcha road of village Solada.	0.34
	Hingula	Repairing of roof & windows of Majhika Naraharipur U.P School.	7.07
	Hingula	Toilent & Urinals at Hingula Mahavidyalaya.	3.39
	Kaniha	Financial assistance to Mahila Mandal for Social Welfare works.	0.50
	Kaniha	Organising Health camp at Jarada village.	0.10

	Kaniha	Providing lunch towards sports & games to school children of Badatiribida & Sanatibida Panchayat.	0.30
	Kaniha	Finacial assistance to the villagers.	1.05
	Kaniha	Celibration of Republic day-2013.	0.05
	Lingaraj	Construction of approach WBM road from village road to Shiv Mandir, Kandhal.	4.94
	Lingaraj	Providing & fixing of , Demarcation RCC pillars for Demarcation of land to Irregation Cannel.	0.27
	Lingaraj	Berm cleaning/Surface dressing & sweeping of both sides from Handidhua chhak to Gandhi Chowk.	0.97
	Lingaraj	Providing of Labours for sparing of Anti Larva Chemicals for Containing the meanance of Dengue of Lingaraj Area.	0.36
	Lingaraj	Sinking of Tube well through fast drilling sopisticated Rig at tarini Mandir , Kandhal Village.	0.70
	Lingaraj	Filling of moorum on both side of road side of irregation canel to Gandhi Chowk.	3.03
	Lingaraj	Repairing of pot holes damage patches/Surface maintaince of road as when required from Handidhua chhak to Irregation cannel.	5.36
	Lingaraj	Financial Assistant Cricket club Balungaon.	0.10
	Lingaraj	Supervision charges for power supply to Naraharipur.	1.35
	Lingaraj	Repairing of public road from Gandhi chhak to Pabitramohan Chowk.	2.22
	Lingaraj	Mahila Sangh Deulbera (Blood donation).	0.25
	Lingaraj	Supervision charges to CESU.	0.09
	Lingaraj	Grass cutting of Talcher Stadium.	0.17
	Lingaraj	Assistance to Hensmul Grampanchayat.	0.05
	Lingaraj	Painting of Talcher Gate.	0.21
	Lingaraj	Mahila Mandal for different CSR works. (Financial assistance 2012-13).	0.50
	Lingaraj	CSR project to conduct cultural programme for school children.	0.90
	Lingaraj	Construction of approach road to M.E.School, Talcher.	3.12
	Lingaraj	Fixing of Grill in DLB High School.	0.80
	Lingaraj	Spraying of water from Dera to irregation cannel and others Roads of vIllages sides for dust supresion.	8.66
	Lingaraj	Repairing of road from Gandhi chhak to Pabitramohan Marg.	106.30
	Lingaraj	White washing of Talcher college.	1.00
	Lingaraj	Sweeping of road from BLD rehabilation colony to Handidhua chhak.	0.07
	Lingaraj	Painting of Cultural Mandap of Deulbera.	0.10
	Lingaraj	Repairing of pot hole on road from Handidhua to Gandhi chhak.	0.99
	Lingaraj	Extension of pipe line from Main Borewell of MCL at Rani park.	5.20
	Lingaraj	Power supply to Naraharipur & Jadunathpur.	8.16
	Lingaraj	Washing & painting of SDPO office.	0.24
	Lingaraj	Water supply to villagers through water tanker in Lingaraj area including Municipility.	67.54
	Jagannath	Construction of 03 nos classroom at Aurbindo Integral Education and Reseach Centre Matrubhumi at Dera.	0.07
	Jagannath	Construction of wall of Hiloi Ekdal School.	3.97

	Jagannath	Repair of Hiloi Ekdal High School.	4.58
	Jagannath	Construction of staging & installation of water tank at Naraharipur RR site.	4.93
	Jagannath	Deepening of existing pond of village Radharamanpur,Belpara,Gopaballabhpur,Luhundi,Akarpal,Brajnathpur,Godibandha,Bangaru Bridge,Dera in Jagannath area	18.15
	Jagannath	sinking of 01 no. bore well in village Brundabanpur	5.62
	Jagannath	Water supply to villagers through water tanker in Jagannath area.	47.57
	Jagannath	Village Health Camps (Aids ,Eye camp, Family welfare, Cancer Detecction,and other awareness programme).	6.91
	Jagannath	Grant of Mahanadi Medical Education Trust.	6.94
	Jagannath	Preventing Dengue at Hensmul village.	1.71
	Jagannath	Construction of approach road to New Naraharipur RR site near PMIT.	8.25
	Jagannath	Proposed moorum road from Charbatia sahi near Kandhal village to Jadunathpur of Bhubneswari OCP.	4.24
	Jagannath	Construction of Hume pipe culvert over Bangarunala at Brundabanpur	4.93
	Jagannath	Providing pipeline at model police Station at Talcher.	1.48
	Jagannath	Repair and Reconstruction of road Handidhua Chhak to Balram prasad chowk and conveyor crossing at Chalagarh to Central Colony.	93.55
	Jagannath	Barbed wire fencing & morrum topping from Brundabanpur to Bangarunala and fron Upper Sahi to Tala Sahi.	4.18
	Jagannath	Construction of road from Chalagar Samal sahi to Mangala sahi(Nadiager) under CSR.	9.95
	Jagannath	Construction of road at village New Balanda.	0.23
	Jagannath	Development of Poly Sabha ground of village Ekdal.	1.38
	Jagannath	Maintenance of sabhaghar at Ekdal village.	1.84
	Jagannath	Miscellaneous work at Ghantapada village.	0.56
	Jagannath	One time drain repair at village Ghantapada.	0.49
	Jagannath	Plantation at village Gurujang.	1.91
	Jagannath	Providing RCC slab to worshipping centre to village Dera.	0.10
	Jagannath	Renovation of Baghamara School.	2.48
	Jagannath	Renovation of Talcher college.	0.96
	Jagannath	Repairing of road from Bangarunal to Ekdal.	6.72
	Jagannath	Repair of road from Gurudawara to FCI Gate.	6.29
	Jagannath	Repairing of road at village Ghantapada.	0.33
	Jagannath	Shifting of community Workship centre from Hensmul Baidyasahi to decided place.	7.14
	Jagannath	Strengthening diversion road near playground of village Hensmul.	1.13
	Jagannath	Supplying sewing machine.	0.23
	Angul	Fin,asst to school for Blind,Deaf & Dumb children in Angul District	6.00
	CWS	MCL aid for salary payment of staff in other developmental works.	16.00

	Talcher		
	Talcher	MCL aid for salary payment of Teacher.	7.25
	Talcher	Water supply to villages of Talcher area.	34.00
	Talcher	Modification of bus stop at Dera Chhak under CSR scheme, Talcher area.	0.93
	Talcher	Providing and laying G.I pipe line from Gantapada to Rodasahar Village.	1.85
	Talcher	CSR health camp at village.	0.37
	Talcher	CSR Sports & Culture expenditure.	0.05
	Talcher	Mahila Mandal CSR activities.	1.40
	Angul	Realease of 2'nd installment as finacial assistance for strengthening & widening of Angul-Chhendipada-Sarpal Budhapal road.	700.00
	Angul	Release of CSR fund for proposed Construction of new 100 beded ward at district Head Quarter Hospital at Angul.	140.00
	Total		**1724.60**

ANNEXURE-III

Information Sheet of Plantation CAMPA for the year 2009 to 2014

Year	Name of Scheme	Name of Range	Name of CD Block	Name of GP	Location	Area in Ha.	Nos. of Seedling Planted	Species planted
2009-10	**Comp. Afforestation**	Talcher	Talcher	Padmabatipur	S.Z Ananta OCP (RakasRF)	1.77 Ha. (Block)	3000	Acacia-2200, Chakunda-500, Karanj-300 nos.
		Kaniha	Kaniha	Hanumanpur	S.Z Phuljhari	5.40 Ha. (RDF)	1620	Amla-1000,Jamu-220, Karanj-400 nos.
		Talcher	Talcher	Ghantapada	Kauchiakhol	40 Ha. (RDF)	12000	Acacia-2200,Karanj-5000, Amla-500, Sirisa-1000, Jamu-1000, Teak-1000, Gambhari-500, Neem-500, Chakunda-300 nos.
2010-11	**Comp. Afforestation**	Kaniha	Kaniha	Kaniha	Pitachragudi RF	CA-RDF-18 Ha.	5400	Acacia-3000,Karanja-500,Jamu-400, Chakuna-2000, Acacia-1527 nos.
		Talcher	Talcher	Ghantapada	Kauchiakhol BRF	SZ-RDF-30.09 Ha.	9027	Neem-2500, Mahanim-500, Karanj-2500, Chakunda-2000, Acacia-1527 nos
		Talcher	Talcher	Padmabatipur	Rakas RF	SZ-Block-6.033 Ha.	9653	Karanj-6500, Acacia-2500, amla-653 nos.
		Talcher	Talcher	Ghantapada	Kauchiakhol BRF	1.5 SZ-RDF-50.13 Ha.	-	Without Gap planting
		Chhendipada	Chhendipada	Durgapur	Durgapur RF	1.5 SZ-RDF-10 Ha.	3000	Teak-3000 nos.
	CATP-Rengali	Chhendipada	Chhendipada	Similipal	Debinagar PRF	RDF-50	-	Without Gap Planting

	Irrigation Project					Ha.		
		Chhendipada	Chhendipada	Chhendipada	Chhendipada RF	RDF-50 Ha.	-	
		Talcher			Rabipur RF	RDF-50 Ha.	-	
		Talcher	Kaniha	Samal	Kanheijena RF	RDF-50 Ha.	-	
		Kaniha	Kaniha	Derenga	Chandrapada RF	RDF-50Ha.	15000	Sisso-500, Acacia-5000, Chakunda-1500, Amla-1000, Simruba-1000, Bahada-500, Neem-1000, Sirisa-1000, Karanja-2000, Jamu-500, Radhachuda-1000 nos.
		Kaniha	Kaniha		Poipaldanda-RF	RDF-50Ha.	15000	Teak-2000, Acasia-5000, Chakunda-4500, Sirisa-500, Simruba-2000, Amla-1000 nos.
	Rengali Irrigation Project (Canal Bank Plantation)	Talcher			Left Canal	Block-20Ha.	50,000	Karanj-6000,Sisso-5000, Radhachuda-15000, Acacia-6000, Sirisa-7000, S. Chakuda-8000, B. Chakunda-3000 nos.
		Talcher			Right Canal	Block-30Ha.	75,000	Radhachuda-15000, Acacia-12000, Sirisa-7000, Sisso-4000, Eucalypatas-3000, Bada Chakunda-8000, S. Chakunda-6000, Gambhari-8000, Neem-2000, acacia menguiium-10000 nos.
	CAMPA							
	Kanja Watershed	Rigoda	Angul	Badkantula	Naukheta-ii & Kanja	Block-20Ha.	32000	Teak-7000, Bamboo-6000, Chakunda-5000, Sirisa-5000, Siso-2000, Acacia mangium-1000, Gambhari-1000, Karanj-5000 nos.

	Bhubanpur W/S	Rigoda	Angul	Talgarh	Balanga-9 & Bhubanpur	Block-10Ha.	16000	Teak-4000,Bamboo-4000,Amla-1000, Sirisa-200, Sisoo-1000, Acacia mangium-800, Chakunda-100, Karanj-4000 nos.
	Kanja W/S	Durgapur	Banarpal	Kanjra	Kanjra VF	Block-30Ha.	48000	Teak-41000, Karanj-3000, Simruba-1000,Acacia-3000 nos.
	Ugi W/S	Durgapur	Chhendipada	Ugi	Pathargarh PRF	Block-20Ha.	32000	Teak-16000, Karanj-5000,Sisoo-4500, Simruba-1000, Acacia-5000, Nim-500 nos.
	Karada W/S	Chhendipada	Chhendipada	Durgapur	Durgapur RF	Block-4Ha.	6400	Karanj-3400,Teak-2500,Acacia-500 nos.
	Golagadia W/S	Chhendipada	Chhendipada	Bahalsahi	Golagadia VF	Block-35Ha.	56000	Karanj-14000, Teak-16000, Amla-5000, Neem-2500, Sirisa-1900, Radhachuda-2000, Khaira-1500, Acaica-3600, Badachakunda-2500, Bamboo-2000, Eucalypatas-2000, Sisoo-2000, Gambhari-1000 nos.
	Golagadia W/S	Chhendipada	Chhendipada	Tangri	Nuapada VF	Block-16Ha.	25600	Karanja-8000,Amla-3000, Neem-1150, Chakunda-1000, Acacia-950, Sirisa-4000, Khaira-2000, Eucalypatas-2700, Teak-2800 nos.
	Kulansingha W/S	Purungarh	Angul	Kulansingha	Kulasingha PRF	Block-20Ha.	32000	Bamboo-3000,Teak-15000,Acacia-3000, Acacia mangium-800, Neem-1000, Chakudna-2000, Simruba-3000, Karanja-3000, Sisoo-1200 nos.
	Kaliakata W/S	Pururngarh	Chhendipada	Nisha	Kaliakata RF	Block-10Ha.	16000	Bamboo-3300, Radhachuda-1300,Chakunda-1500,Sisoo-

								1200, Karanja-5000, Neem-500,Bahada-700,Sirisha-1500,Acacia-1000 nos.
	Bulajhar W/S	Talcher	Kaniha	Biru	Bulajhar VF	Block-20Ha.	32000	Teak-20000,Karanja-5400, Sisoo-5000, Amla-1000, Radhachuda-600 nos.
	Bulajhar W/S	Talcher	Kaniha	Biru	Biru VF	Block-25Ha.	40000	Teak-20000, Karanja-15000, Sisoo-2000, Amla-1000, Radhachdua-500,Bamboo-500, Sirisha-1000 nos.
	Gaham W/S	Talcher	Kaniha	Gaham	Gaham KF	Block-50Ha.	80000	Teak-35000,Karanja-35000, Sisoo-5000, Radhachdua-1500, Sirisha-1000, Bamboo-500, Amla-2000 nos.
	Sapkata W/S	Kaniha	Kaniha	Hanumanpur	Sapkata VF	Block-50Ha.	80000	Teak-35000,Karanja-6000, Neem-1800, Sisoo-2700, Acacia-10500, Chakunda-5500, Sirisha-2000, Arjuna-1500, Radhachuda-1000, Phasi-1000, Bahada-1000, amla-4000, Khaira-2000, Badachakunda-700, Bamboo-3500, Simruba-1100, Jamu-700 nos.
	Khajuria W/S	Kaniha	Kaniha	Hanumanpur	Arakhadahi RF/VF	Block-50Ha.	80000	Teak-24600, Karanja-5650, Phasi-1600, Arjuna-1000, Neem-1000, Amla-6000, Bamnoo-1000, Sirisha-7500, Acacia-7500, Chakudna-10000, Khaira-3000, Radhachuda-1600, Kanchan-1500, Bahada-900, Sisoo-2200, Meghani-400, Mahula-900,

								Badachakunda-500, Gambhari-1000, Jamu-500, Simruba-1150, Eucalypatas-500 nos.
2011-12	**Comp.Afforestation (CAMPA APO2010-11)**	Talcher	Kaniha	Biru	Bulajhar RF	CA-RDF-189Ha.	Nil	RDF work without Gap Planting
		Talcher	Kaniha	Seepur	Seepur RF	CA-RDF-17Ha.	5100	Teak-5100 nos.
		Kaniha	Kaniha	Kaniha	Patharmunda VF	SZ.Block-7.83Ha.	12528	Neem-2000, Acacia-5000,Chakunda-4500, Sisoo-678, Simruba-350 nos.
	Comp.Afforestation (CAMP APO2011-12) Jagannath OCP by MCL	Talcher	Talcher	Padmabatipur	Rakas RF	SZ.Block-2.401HA.	60003	Chakunda-6003 nos.
	Rengali Irrigation Project (Canal Bank Plantation)	Talcher	Kaniha	Kulei	Left Canal	Block-8Ha.	12800	Radhachuda-8000, Chakunda-2000, Neem-1000, Karanj-1000, Simruba-800 nos.
		Talcher	Talcher	Gurujang & Dharampur	Right Canal	Block-22Ha.	35200	Radhachuda-17000, Chakunda-10000, Neem-3400, Karanj-4000,Acacia-800 nos.
	CATP (Rengali Irrigation Project)	Chhendipada	Chhendipada	Kosala	Chakundapal RF	RDF-50Ha.	-	ANR (RDF) work without Gap Planting
		Chhendipada	Chhendipada	Brajnathpur	Jeypur	RDF-100Ha.	-	
		Talcher	Talcher	Padmabatipur	Kandhaberini RF	RDF-50Ha.	-	
		Talcher	Kaniha	Brajnathpur	Sibrampur RF	RDF-50Ha.	-	
		Talcher	Kaniha	Biru	Bulajhar RF	RDF-50Ha.	-	
		Kaniha	Kaniha	Dalaka	Poipaldanda RF	RDF-50Ha.	-	

		Kaniha	Kaniha	Hanumanpur	Nialu-Lodhajhari RF	RDF-100Ha.	-	
		Kaniha	Kaniha	Talpada	Durgapurdanda RF	RDF-50Ha.	-	
2012-13	**COMP. Afforestation**							
	Utkal BI Coal by M/S Jindal	Kaniha	Kaniha	Hanumanpur	Buadbeda	CA-Block-33.722Ha.	53956	Amla-5000, Acacia-10000, Chakunda-10000, Teak-18000, Simruba-6456, Neem-3000, Karanj-1500 nos.
	Integrated still complex with CPP by M/s JSPL	Rigoda	Angul	Talgarh	Kantamegha, Ragadipada	CA-RDF-168.232Ha.	33647	Neem-3000, Simruba-200, Siosso-900, Jamu-200, Sirsiha-2025, Bamboo-2133, Teak-18000, Acacia-1908, Chakunda-1200, Karanja-4081 nos.
	Utkal BI Coal by M/S	Kaniha	Kaniha	Hanumanpur	Arakhadahi RF/VF	1.5SZ-RDF-4HA.	800	Teak-300, Acacia-100, Chakunda-300, amla-100 nos.
	Nandira UG Minng for Coal in Talcher area by M/S MCL	Talcher	Talcher	Danera	Kauchiakhola RF	SPI-RDF-50Ha.	0	
		Talcher	Talcher	Danera	Hirapur-RF	SPI-RDF-50Ha.	0	
	Rengali Irrigation Project (Canal Bank)	Talcher	Talcher	Bantula, Jagannathpur	Right Canal	Canal Bank-30Ha.	48000	Radhachuda-12000, Chakunda-4000, Neem-22500, Acacia-4000, Karanj-1000, Gambhari-500, Sirisha-4000 nos.
	Rengali Irrigation Project –CATP	Durgapur			Debinagar PRF	RDF-100Ha.	0	ANR(RDF) without GAP Plantation
		Durgapur			Similipathar RF	RDF-20Ha.	0	
		Chhendipada	Chhendipada	Barapada	Durgapur RF	RDF-100Ha.	0	
		Chhendipada	Chhendipada	Kanloei	Kanloei RF	RDF-	0	

						100Ha.		
		Chhendipada	Chhendipada	Kamsla	Sunerijharan PRF	RDF-50Ha.	0	
		Chhendipada	Chhendipada	Jaltap	Jaltap RF	RDF-50Ha.	0	
		Talcher	Kaniha	Biru	Bulajhar ARF	RDF-50Ha.	0	
		Talcher	Kaniha	Biru	Mankadchua ARF	RDF-50Ha.	0	
		Talcher	Kaniha	Biru	Langalkhol ARF	RDF-50Ha.	0	
		Talcher	Kaniha	Hariharpur	Kanteikolia BRF	RDF-50Ha.	0	
		Kaniha	Kaniha		Ptakhaman BRF	RDF-100Ha.	0	
		Kaniha	Kaniha	Santribida	Badakathia BRF	RDF-100Ha.	0	
2013-14	**CAMPA APO (2012-13)**							
	Bald Hill Plantation	Raigoda	Angul	Banarpal	Phulpada Bald Hill	AR-25Ha.	40000	Teak-8500,Bamboo-1500, Khaira-5000, Chakunda-3000, Acacia-6000, Sirisha-3000, Simaruba-7000, Cashew-3000, Sisoo-3000 nos.
		Raigoda	Angul	Baragounia	Magurkhal Bald Hill	AR-25Ha.	40000	Teak-8500, Bamboo-1500, Khaira-5000, Chakunda-3000, Barakuli-3000, Amla-3000, Sirisa-3000,Sisoo-3000, Simruba-7000, Cashew-3000 nos.
		Purunagarh	Angul	Kumunda	Kumunda Taltaila	AR-50Ha.	80000	Jamu-16200, Bahada-300, Acacia arikuli-3500, Acacia manjium-3000, Karanj-15000, Sanachakunda-4500, Simruba-5000, Amla-3000,

								Neem-19500, Khaira-4700, Cashew-1300, Bamboo-2000, Sunari-1000, Kanchan-1000 nos.
	Comp.Afforestation	Durgapur	Chhendipada	Katada	Katada Comp. Affn.	AR-12Ha.	19200	Teak-4000,Acacia-3000,Chakunda-3000, Bada Chakunda-2000, Arjuna-200, Amla-1000, Karanj-600, Kahira-500, Neem-3000, Kumbi-200, Subabul-1000, Sirisa-500, Phasi-200 nos.
		Kaniha	Kaniha	Kaniha	Gohirdanda RF	AR-10Ha.	16000	Teak-2000,Arjuna-2000, Neem-3000, Jamu-1000, Karanj-1000, Simili-400, amla-1000, Phasi-1100, Simruba-1000, Sirisa-500, Chakunda-3000 nos.
	CATP (Rengali Irrigation Project)	Chhendipada	Chhendipada	Changudia	Kankurpal RF	ANR-50Ha.	10000	Teak-10000 nos.
		Chhendipada	Chhendipada	Kosala	Kosala RF	ANR-50Ha.	10000	Teak-10000 nos.
		Chhendipada	Chhendipada	Nuagaon	Dangapal RF	ANR-100Ha.	20000	Acacia-3500, Mangium-2000,Albizia Procera-1000, Albizia Irebbak-1000, Kaju-500, Chakunda-12000 nos.
		Chhendipada	Chhendipada	Nuagaon	Nunmati RF	ANR-100Ha.	20000	Acacia-3000,Mangium-2000,Albizia Procera-2000, Albizia Irebbak-2000, Kaju-1000, Chakunda-10000 nos.
		Chhendipada	Chhendipada	Kanloi	Marudhipa RF	ANR-100Ha.	20000	Acacia-5000, Mangium-3000, Teak-2000, Chakunda-10000 nos
		Kaniha	Kaniha	Bijigol	Durgapurdanda RF	ANR-50Ha.	10000	Teak-4000, Acacia-1000, Karanj-1200, Amla-500, Arjuna-1000, Gambhari-

								800, Neem-500, Chakunda-1000 nos.
		Kaniha	Kaniha	Kakudia	Santarabandha RF	ANR-50Ha.	10000	Teak-1000, Simruba-250, Neem-2000, Chakunda-750, Karanj-3000, Arjunda-2000, Amla-500, Kumbhi-250, Simili-250 nos.

Source: Data get through RTI application with letter no 7723 dated 3.11.14 from Office of the Division Forest Officer: Angul Division

PC-HOUSEHOLD SCHEDULE (Mining)

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
HOUSEHOLD SCHEDULE
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

Name of the Respondent: Sex:

Age: Caste/Tribe: BPL/APL:

SECTION 1: GENERAL

1.1. Geographic Information

State		District		Block	
G.P.		Village		Distance from the mine	

1.2. Household composition (Include members who stay permanently)

Sl. No.	Name (Start with head of House Hold)	Relation with HH	Sex (Male-1/Female-2)	Age*	Marital Status	Educational Qualification	Main Occupation	Subsidiary Occupation	Current Annual Income (Rs)
1									
2									
3									
4									
5									
6									
7									

* Enter the completed age (for less than one year age = 00, 98 years and above =98) or
Date of birth after verifying records

Codes used:

Relationship with HoH (Column 3): Self-HoHH-1/Spouse-2/Father-3/Mother-4/Father-in-law-5/Mother-in-law-6/Uncle-7/Aunt-8/Brother/Brother-in-law-9/Sister/Sister-in-law-10/Son/Son-in-law-11/Daughter/Daughter-in-law-12/Nephew-13/Niece-14/Own grandchildren-15/Sibling's grandchildren-16/Cousin (brother)-17/Cousin (sister)-18/Live-in domestic help-19/Others (specify)-20

Marital Status (Column 6): Married (1), Unmarried (2), Divorcee (3), Widow/Widower (4), Separated/Deserted (5)

Educational Qualification (Column 7): Illiterate (1); Literate (2); Primary (3); Middle (4); Matriculate (5); Intermediate (6); Graduate and above (7); Professional qualification (Specify)(8); other (Specify)(9)

Occupation (Column 8 & 9): Cultivation-1/Dairy-2/Fishery-3/Goatery & other animal rearing-4//Daily Wages-Agricultural Labourer-5/Skilled Wage Labourer-6/Semi or Unskilled Wage Labourer-7/Service-Private Sector-8/Service-Government-9/Trade/Business-from fixed premises-10/Owner of SSI/Cottage Industry-11/Other Self-employed-12/Professionals-13/Household Industry-14/Artisan-15/Vendor(Cycle/Pheri wala)-16/Others (Specify)-17

SECTION 2: LIVELIHOOD

2.1. Do you have any idea about mining activities in your village? 1. Yes 2.No

2.2. If yes what method(s) of extraction is/or are used by the mining company?
1. Opencast 2. Underground 3. Dredging 4. Any other (Specify).....

2.3. If yes, can you mention the name of the mining company operating in your area?
1. Yes 2. No.

2.4. Can you recall the year when mining activity started in your village?
1. Yes (Year:) 2. No.

2.5. Does your family get affected by mining at starting? 1. Yes 2. No

2.6. Does your family/villagers were consulted before mining? 1. Yes 2. No. 3. Not aware

2.7. If No, does your family/villagers protested? 1. Yes 2. No. 3. Not aware

2.6. If Yes, Compensation received? 1. Yes 2. No

2.7. If Yes, Nature of Compensation: 1. Job; 2. Monetary; 3. Physical; 4. All

2.8. For Economic Rehabilitation purpose what type of assistance you have received?

1. Job in the project 2. Job in other sector 3. Agricultural land
4. Training for self-employment 5. Shops in market compl 6. Cash in lieu
7. other (Specify)….. 8. Not received anything

2.9. Were you entitled to get that assistance what you received? 1. Yes 2. No 3. Not aware

2.10. Did you proposed for that job, which you received? 1. Yes 2. No

2.11. Do you feel you had qualification at the time of applying for the job? 1. Yes 2. No

2.12. Were you provided with any skill up gradation training by Project? 1. Yes 2. No

2.13. Are you placed in right job after training? 1. Yes 2. No

2.14. If you have received any Monetary Compensation: Amount (Rs.):

1. 1-50,000 2. 50,000-1Lakh 3. 1 Lakh-2.5 Lakh 4. 2.5 Lakh-5Lakh 5. Above 5 Lakh

2.15. Did you know the way the compensation was calculated? 1. Yes 2. No

2.16. If no, have you ever asked the concerned authority for this? 1. Yes 2. No

2.17. Are you satisfied with the Compensation paid to you? 1. Yes 2. No

2.18. If 'No' what are your grievances? Specify in detail

1. Calculation is improper 2. Partially calculated 3. Based on Personal relation

4. Political influence 5. Any other

2.19. Did you put your grievances before LAO or Collector? 1. Yes 2. No

2.20. If you have not received any compensation specify the reasons?

1. Not properly measured, 2. Claimed land is govt. land; 3. No voice;

4. Politics 5. Any other (specify)

2.21. Land Acquisition & Compensation

Category of Asset	**Kissam/Type of Structure**	**Extent possessed**	**Extent acquired**	**Details of Compensation Payment**				**Reason of not receiving compensation**
				Amount Due (Rs)	Amount Received (Rs)	Year	Amount not received (Rs)	
Recorded Cultivated Land (Acs)								
Recorded Homestead Land (Acs)								
Recorded Orchard land (Acs)								
Encroached Forest Land (Acs)								
Encroached Government land								
House (Sq ft)								
Cattle shed (Sq ft)								
Other House structures (Sq ft)								
Tank/Pond (Nos. & Sq ft)								

Open Well/Tube well (Nos. & Sq ft)								
Trees (Nos)								
Irrigation Units (Nos)								
Others								
Total								

2.22. Source of Family Income

Sl. No.	**Sources of work**	**Number of family members engaged**		**Nature of work**				**Annual income (Rs)**	
				Continuous/Seasonal		**Duration of work**			
		Pre-mining	Post-mining	Pre-mining	Post-mining	Pre-mining	Post-mining	Pre-mining	Post-mining
1.	Agriculture								
2.	Wage labour								
3.	Employment (Govt.)								
4.	Employment (Pvt.)								
5.	Employment (MCL)								
6.	Common Property Resources								
7.	Business								
8.	Dairy/Livestock								
9.	Fishery								
10.	House rent								
11.	Others (Specify)								
	Total								

Duration of work: 1. Less than 100; 2. 100-150 days; 3. 150-200 days; 4. 200-250 days ; 5. Above 250 days.

2.23. Housing and other amenities before and after mining

Housing and other amenities		**Before**	**After**
House type	1-Pucca/ 2-Semi-Pucca/ 3-Kutcha/ 4-Hut/ 5-Temporary		
Sanitation	1-yes, 2-no		
Kitchen room	1-Separate/2-Attached		
Cow shed	1-Separate/2-Attached		
Main Cooking fuel	1- Wood, 2-charcoal,3-kerosine, 4-Cow dung, 5-Gas		
Main source Drinking water	1-Tube well, 2- open well, 3-stream, 4-pond		
Cow shed	1-yes, 2-no		

2.24. Ownership of Asset before and after mining

Particulars	**Before** (Yes,1; No,2)	Number	**After** (Yes,1; No,2)	**Number**

Cycle				
Motor cycle/scooter				
Tractor				
Pump sets-deasel/elec				
Plough				
Bullock cart				
Fridge				
Radio				
TV				
Music System				
Others				

SECTION 3 : IMPACT OF COAL MINING ON AGRICULTURE

3.1. Do you feel mining has some impact on agricultural production? 1. Yes 2. No

3.2. If yes, explain how pollution from mines has affected agricultural production?

1. Land filled with dust 2. Plants are infected by insects 3. Loss of eco-friendly insects
4. Loss of water table 5. Water consumed by mining 6. Other……

3.3. Have you brought any changes in your cropping pattern? 1. Yes 2. No

3. 4. If yes, mention the changes.

1. Going for cash crop 2. Going for early variety of crop 3. Water resistance crop
4. 5. 6.

3.5. Are you getting adequate water for your agriculture? 1. Yes 2. No

3.6. If no state the reason

1. Water got polluted 2. Mining industry consume all water 3. Water table reduced
4. 5. 6.

3.7. Do you think the pollution of water has reduced the agricultural production?

1. Yes 2. No

3.8. If yes, please explain

1. Pollution has killed ecofriendly insect 2. 3.
4. 5. 6.

3.9. Do you think loss of some ecofriendly insects due to mining has brought a loss to Fertility capacity of land? 1. Yes 2. No

3.10. If yes, can you site some examples?

3.11. Land Holding Particulars

Area (in Acres)							
Area Owned *		**Area leased in**		**Area Leased out**		**Net sown area•**	
Before	**After**	**Before**	**After**	**Before**	**After**	**Before**	**After**

* Area Owned = Total Area – Home Area
Net sown area/Net operated area = Area Owned + Area leased in – Area leased out

3.12. Are you cultivating the entire land you possess? 1. Yes 2. No

3.13. If no explain why?

1. Loss of productivity of land 2. Unavailability of labour 3. Lack of water

4.Field with coal dust 5. High cost 6.other……..

3.14. Changes in cropping pattern due to mining pollution

Season	**Name of the Crop**			**Area cultivated (in acre)**			**Production (in Quintal)**		**Price per quintal**	
	Before	**After**	**Reason for change**	**Before**	**After**	**Reason for change**	**Before**	**After**	**Before**	**After**
Kharif										
Rabi										

3.15. Costs of Cultivation per Acre

Sl. No	**Item**	**Kharif**		**Rabi**	
		Before	**After**	**Before**	**After**
1	Crop Name (main)				
2	Cost on seed (Rs)-**per acre**				
3	Cost on Labour (Rs)				
4.	Cost on fertilizer & pesticide (Rs)				
5.	Cost on seed (Rs)				
6.	Cost of irrigation (Rs)				
7.	Cost on Plough (Rs)				
8.	Total Cost				

3.16. Estimation of Damage Cost

Si.no	Items damaged	Cost in rupees
1	Pump sets	
2	Bore well/Tube well	
3	Vehicles	
4	Other machineries	
5	land became uncultivable	
6	Total	

SECTION 4 : IMPACT OF COAL MINING ON BIODIVERSITY

4.1. Do you feel mining pollution has some impact on local biodiversity? 1. Yes 2. No.

4.2. If yes explain

1. Loss of flora 2. Loss of fauna 3. Polluted local environment

4.Loss of habitat 5. Change in water table 6. All above

4.3. Do you feel the dust due to mining has reduced the productivity capacity of a Tree?

1. Yes 2. No

4.4. If yes explain

1. Dust has covered tree 2. Reduced water quality 3. Any other

4.5. Is there any loss to local grazing land due to mining? 1. Yes 2. No

4.6. Are you getting much fodder for your livestock? 1. Yes 2. No

4.7. Do you feel there is loss of vegetation in your area? 1. Yes 2. No

4.8. What are the MFP you used to collect from local forest earlier?

4.9. Are you getting the same MFP which you used to collect from forest earlier?

1. Yes 2. No

4.10. If no, what happen to all these products?

1. Loss of forest 2. Loss of forest based productivity 3. Loss of control

4. 5. 6.

4.11. Explain about the loss of herbal medicines and its implication

4.12. Do you have recognized any change in the case of flower trees in the context of time and season of flowering? 1. Yes 2. No

4.13. If yes, can you explain?

1. Some flowers are not blooming 2. Some are in different season 3. Any other

4.14. Do you think that there is a loss to some animals which used to be seen in your local forest?
1. Yes 2. No

4.15. If yes explain about those animals

4.16 State your view-in what way mining has disturbed the wildlife?

1. Direct & Indirect mortality 2. Habitat loss / Alteration 3. Reduced habitat
4. Increase human access 5. Blockage of movement 6. Loss of vegetation
7. Fragmentation of habitat 8. Hunting/poaching 9. Other……

4.17. Explain what kind of loss has seen in your area due to deforestation?

1. Loss of livelihood 2. Increase in pollution 3. Water table reduced
4. Soil erosion increased 5. Increased temperature 6. Any other…….

4.18. Family's Loss of Resource Due to the Project (mention in amount-RS.)

HHS	TYPE OF LOSS									
	M.F.P. Collection		Fire wood Collection		Hunting/ Fishing		Raw material for Household Industry		Any other type of loss	
	B	A	B	A	B	A	B	A	B	A
Grand Total										

SECTION 5 : IMPACT OF COAL MINING ON WATER

5.1. Facility of Water

Use of Water (Put codes)	Period	Source of Water*			Distance of water source**			No of sources***		
		R	W	S	R	W	S	R	W	S
Drinking	Before									
	After									
Washing/Bathing	Before									
	After									
Cattle/Livestock use	Before									
	After									
Irrigation										

@S-Summer, W-Winter, R-Rainy season

**Own well-1/Community well-2/Own Tube well/Hand pump-3/Community Tube well/ Hand pump-4/Stream-5/River-6/Tank-Pond-7/Other (specify)-8*

*** Within house-1/Less than 100 meters-2/100-250 meters-3/250-500 meters-4/500 metres-1 Km-5/1 Km – 2 Km-6/2 Km – 5 Km-7/More than 5 Km-8*

**** 1.1-2; 2.2-3; 3.3-4; 4.4-5; 5. More than 5*

5.2. Fetching of Water

Sl.No	Particulars	Before	After
1	People involved in fetching water	1.M 2.W 3. C 4. All	1. M 2. W 3. C 4. All
2	Time spent for fetching water (hour)	1. ½ hour 2. 1 hour 3. 1-2 hour 4. Above 2	1. ½ hour 2. 1 hour 3. 1-2 hour 4. Above 2

5.3. Do you feel there is scarcity of water for domestic use? 1. Yes 2. No

5.4. If yes then explain why and how?

5.5. Is there water pollution in your locality? 1. Yes 2. No

5.6. What are the sources of water pollution?

1. Mining water going to river 2. No recycling 3. Dumping ash
4. 5. 6.

5.7. Are you putting bleaching power in the well regularly? 1. Yes 2. No

5.8. If yes how frequently do you put?

1. Once in a week 2. Twice in a week 3. Once in a month
4. Twice in a month 5. Quarterly 7. Others, specify.....

5.9. What type of container do you use for keeping drinking water?

1. Mud pot 2. Filter 3. Aluminum Container
4. Plastic Bottles 6. Others, specify.....

5.10. Are all members of your family taking bath every day? 1. Yes 2. No

5.11. Is MCL is providing safe drinking water to you? 1. Yes 2. No

5.12. If yes, are you happy with the amount and frequency of water getting? 1. Yes 2. No

5.13. If you are not happy in getting water mention the reason?

1. Not regular in supply 2. Amount is very less 3. No proper purification
4. 5. 6.

SECTION 6 : IMPACT OF COAL MINING ON HEALTH

6.1. In your opinion, which one of the following best describes your current health status:

1. Excellent 2. Good 3. Fair 4. Poor

6.2. Do you think that health problems are related to air/water quality? 1. Yes 2. No

6.3. In your opinion what are the major health problems you are facing due to pollution?

1. Eye Allergy 2. Skin disease 3. ARI 4. Malaria 5. Gastro
6. Arthritis 7. Fever 8. TB 9. Asthma

6.4. When did you first notice the problems and their symptoms?.....

6.5. Are this health complains new or normal one? 1. New 2. Normal

6.6. Households reporting occurrence of various diseases

S. No	Frequency	Status	Disease/ Frequency									
			Eye Allergy	Skin disease	ARI	Malaria	Gastro-intestinal disease	Arthritis	Fever	TB	Asthma	Any other
1	Daily	B										
		A										
2	Weekly	B										
		A										
3	Monthly	B										
		A										
4	Yearly	B										
		A										

6.7. Whom you feel is more victimized due to mining?

1. Child 2. Women 3. Man 4. Old people 5. All 6. C, W, Old 7. W,C

6.8. State the reason for your view?

6.9. Health Effects (last three years)

No of Family Member	Did you feel any discomfort after the mine Y-1, N- 2	If 1, Specify the type*	How long did the symptom last (days)	Did you adopt any treatment for that? Y-1, N-2	If yes, system of medicine#	Whether hospitalized Y-1, N-2. If Y, no of days	Medical Expenses (Cost)	Total

** 1. Eye Allergy, 2. Skin disease, 3. ARI, 4. Malaria, 5. Gastro-intestinal disease, 6. Arthritis, 7. Fever, 8. TB, 9. Asthma, 10. Any other (specify) # 1. Allopathic, 2. Ayurvedic, 3. Homeopathic, 4. Home remedies, 5. Any other (specify)*

6.11. Is there any primary health centre in your village? 1. Yes 2. No

6.12. If yes how far is it from your residence?

1. Within1 KM **2**. Within 2 KM **3**. Within 3 KM **4**. Within 5 KM **5**. Above 5 KM

6.13. Is MCL is doing anything to address the health needs of the community? 1. Yes 2. No

6.16. If yes mention some of these activities?

1. Health Camp 2. Free Health check up 3. Free Medicine 4. Health Insurance 5. Established health center 6. Sanitation 7.Drinking water

6.17. Has MCL built any health care institution for the service of both workers and people in the community? 1. Yes 2. No

6.18. If yes are you visiting this health center at the time of requirement? 1. Yes 2. No

6.19. If no, mention the reason

1. No doctor 2. Specialist are not there 3. No equipments 4. No medicine
5. Beds are not there 6. Any other (specify)

6.20. Does MCL has given health insurance to all your family members? 1. Yes 2. No

6.21. Are you happy with the service provided by that health center? 1. Yes 2. No

6.22. Does MCL carry out any health campaign programme to educate people in the community? 1. Yes 2. No

6.23. If yes, give any example of such activities you know.

1. Awareness campaign 2. Free pollution mask 3. Use of medicine
4. 5. 6.

6.24. How often are such campaigns carried out?

1. Weekly 2. Monthly 3. Quarterly 4. Bi-annually 5.Yearly
6. Other, specify.....

6.25. Does MCL has done something to take care of hygienic condition of your village?

1. Yes 2. No

6.26. If yes, mention those

1. Sprinkling bleaching power 2. Cleaning environment 3. Recycling used water
4. Using DBT 5. 6.

SECTION 7: IMPACT OF COAL MINING ON LIVESTOCK

7.1. What types of problems livestock are facing?

1. Diseases
2. Weakness
3. Decline in productivity
4. Decline in quality and quantity of manure
5. Death
6. Any other

7.2. Was there any cattle diseases found during past years? 1. Yes 2. No

7.3. When did you first notice the problems first and in what form?

7.4. How did it start?

1. Grazing contaminated grass 2. Drinking polluted water 3. Any others

7.5. How much you spent on their health?

1. 1-Rs. 500 2. 500-Rs.1000 3. 1000-Rs.2500 4. 2,500-Rs.5000 5. Above 5 thousand

7.6. Do you think that the livestock health is linked with water quality? 1. Yes 2. No

7.7. Do MCL is providing any support under CSR programme for the safety and security of livestock? 1. Yes 2. No

7.8. Have you received any support from any agency or department for the betterment of livestock? 1. Yes 2. No

7.9. If yes, please mention from where you got support and what?

1. FD. 2. NGO 3. Panchayat 4. RD 5. TD 6. Other Govt. dept.

7.10. Ownership of Livestock

Livestock	Before (No.)	After (No.)	Livestock	Before (No.)	After (No.)
Cow			Goat		
Buffalo			Sheep		
Ox			Poultry birds		
Others (Specify)			Others (Specify)		

SECTION 8: COAL MINING AND NOISE POLUTION

8.1. Have you ever noticed any kind of noise pollution in your area? 1. Yes 2. No

8.2. What in your opinion is the cause of noise pollution?

1. Moving of heavy vehicles 2. Blasting that takes place during mining operation 3. Cutting large pieces into small pieces 4. Others, specify.....

8.3. Who bears the problem of noise pollution much?

1. Women 2.Children 3. Elderly persons 4.Both women & children

5. Women, children & elderly 6.Others, specify……

8.4. What kind of problems you and your family faced due to this pollution?

1, Hearing 2. Mental disturbance 3. Students' study disturb

4. House cracking 5. 6.

8.5. Does blasting brought any loss to your house? 1. Yes 2. No

8.6. If yes have you drawn the attention of any body for this? 1. Yes 2. No

8.7. Whom you addressed and what was their response?

SECTION 9: MINING AND WORKING ENVIRONMENT

9.1. Do you feel comfortable with the working environment? 1. Yes 2. No

9.2. If no, explain the reasons?

1. Highly polluted 2. High risk 3. No much safety and security facility

4. Exploited by contractor 5. 6.

9.3. Have you faced any injury while working? 1. Yes 2. No

9.4. If yes what kind of injury you faced?

1. Loss of any family member 2. Loss of bodily part 3. Minor injury

4. Serious health problem 5. Burning of body 6.

9.5. Does the company provide all care at the time of injury? 1. Yes 2. No

9.10. Are you satisfied with the facilities given by MCL? 1. Yes 2. No

9.11. Is the company providing sufficient protected clothes to all its workers?

1. Yes 2.No

9.12. Do you have any children below 18 years? 1. Yes 2. No

9.13. If yes, are they going school/college? 1. Yes 2. No

9.14. If no, mention the reasons?

1. Taking care household activities 2. Poo economic condition 3. No school near by
4. Working in mining 5. 6.

9.15. Does any of them working in mining or mining related activities? 1. Yes 2. No

SECTION 10: WILLINGNESS TO ACCEPT AND WILLINGNESS TO PAY

10.1. Looking at the extent of damage caused by mining what could be the effective solution in your opinion?

1.Proper compensation 2. Ecological restoration of abandoned mining 3. Water purification 4. Proper CSR activities 5. Infrastructural development 6.

10.2. Given the severity of problems, do you think that the industries can continue in your area?

1. Yes 2. No

10.3. Do you see any benefits from the existence of industry?

1. Employment 2. Higher Wages 3. Roads to village
4. Provision of drinking water 5. Any other

10.4. if company does not shift its location, will you allow them to continue provided they

1. Give sufficient compensation
2. Purify the polluted water
3. Provide employment to all the villagers 4. Other specify

SECTION 11: ABOUT MITIGATION

11.1. Do you feel mining has polluted your locality? 1. Yes 2.No

11.2. Describe the impact of pollution: (in order of intensity)

1. Human Health
2. Agriculture

3. Livestock
4. Livelihoods
5. Others

11.3. Was there any collective effort in the village to protest against pollution? 1. Yes 2.No

11.4. If yes did you participate in the movement? 1. Yes 2.No

11.5. Who initiated the people's movement?
1. Entire villager 2. Some local political leader 3. Some local person
4. A outside leader 5. 6.

11.6. Is the people's movement effective in your opinion? 1. Yes 2.No

11.7. Is MCL taking any initiatives to mitigate pollution? 1. Yes 2.No

11.9. If yes what do they do? Explain details
1. Purifying water 2. Purifying smoke of the industry 3. Doing plantation
4. Properly throwing ash 5. 6.

11.10. Are you satisfied with the way MCL working? 1. Yes 2.No

11.11. Have you taken the problems to the notice of the Government? 1. Yes 2.No

11.12. What are the Government's responses to the problems so far?
1. Warned to MCL 2. Established water purifying plant 3.Plantation
4. 5. 6.

11.13. Are you aware of Pollution Control Board's activities in your village ? 1. Yes 2.No

11.14. If yes what do they do? Explain in details.
1. Warned to MCL 2. Established water purifying plant 3.Plantation
4. 5. 6.

SECTION 12: ABOUT ABANDONE MINING

12.1. Is there any abandoned mining area in your locality? 1. Yes 2. No

12.2. Does the MCL restoring these abandoned mining areas? 1. Yes 2. No

12.3. If yes, do you have any idea how they are doing these activities? 1. Yes 2. No

12.4. If yes, please explain.

12.5. Does the company consulted with you regarding ecological restoration of this abandoned mining? 1. Yes 2. No

12.6. Was there any Gram Sabha meeting held in your village relating to the above matter? 1. Yes 2. No

12.7. Is those places are now used for cultivation or forestry? 1. Yes 2. No

12.8. If no, why?

1. it is not done properly 2. Not productive 3. Disputed land
4. It is common property 5. 6.

12.9. If MCL is not doing restoration activities have you ever complained? 1. Yes 2. No

12.10. If yes, to whom you complain?

1. MCL officials 2. Panchayat office 3. Local MLA
4. Forest dept. 5. Govt. dept. Any other……..

12.11. What kind of problems you are facing due to improper reclamation of these abandoned mining areas?

1. Water logging 2. Breeding mosquitoes 3. Falling down while walking
4. 5. 6.

12.12. Are you getting back the same land as you have before mining? 1. Yes 2. No

12.13. Have you ever notice the growth of any kind of ecofriendly insects on the refilling land? 1.Yes 2. No

SECTION 13: RESPONSE TOWARDS THE ROLE OF GP/NGO/FOREST/TRIBAL DEPT

13.1. Does anybody apart from MCL help you in getting proper rehabilitation at the time of displacement? 1. Yes 2. No

13.2. If yes, kindly mention the name of the agency or Govt. department

1. NGO 2. TD 3. FD 4. RD 5. GP

13.3. Was there any Gram Sabha/Gram Panchayat meeting held in your area before the intervention of mining company? 1. Yes 2. No 3. No idea

13.4. If yes, were you present there? 1. Yes 2. No

13.5. If yes, mention the details discussed.

13.6. Does any unanimous decision was taken to welcome mining activities in your area? 1. Yes 2. No

13.7. If yes, how many percentage of the total villagers were present in that meeting?

1. 100% 2. More than 50% 3. More than 25% 4. Less than 25%

13.8. Does the Gram Panchayat fight for your right? 1. Yes 2. No

13.9. If yes, mention the activities taken by your GP to preserve your right.

1. Organized agitation 2. Demanded for compensation 3. Take this issue to upper level

4. 5. 6.

13.10. Do you have BPL card? 1. Yes 2. No

13.11. If no, have you approached any officials from your GP? 1. Yes 2. No

13.12. What was their reply?

13.13. If yes, who helped you in getting it?

1. GP 2. BDO 3. Friend 4. Relatives, 5. NGO

13.14. Have you received Indira Abas? 1. Yes 2. No

13.15. If yes, mention the year when you got?.....

13.16. Who helped you in getting it? 1. GP 2. BDO 3. Friend 4. Relatives 5. NGO

13.17. Do you have Job card? 1 Yes 2 No

13.18. If Yes, when you got it…….. (Year mention)

13.19. Who helped you in getting this card?

1. Panchayat office 2. Friend gave 3. BDO 4. Any other

13.20. Have you ever received any work under this programme? 1. Yes 2. No

13.21. If yes, how many days in a year?

1. 1-50 2. 50-100 3. 100-150 4. 150-200 5. 200-250 6. 250 & Above

13.22. If no, why:? 1. No work 2. No information 3. Work for their own people

4. 5. 6.

13.23. Have you ever approached for any work…… 1. Yes 2. No

13.24. If yes, whom you approached?

1. Sarapancha 2. Panchayat Secretary 3. Ward member 4. Gram sathi
5. Somebody else (specify)……

13.25. Does anybody at your home receiving Old age pension: 1. Yes 2. No

13.26. Have you received any training towards the enhancement of agricultural production?

1. Yes 2. No

13.27. If yes, who gave you such training?

1. GP 2. NGO 3. Tribal dept 4. Agricultural Dept. 5. Any other……

13.28. Do any Govt. dept or NGO helping you in use of vermin compost? 1. Yes 2. No

13.29. If yes, mention the dept.

1. NGOs 2. GPs 3. Tribal Welfare
4. Rural Development 5. Forest 6. Any other……

13.30. Does any Govt. dept or NGO working in your area to save the existing rivers or water resources from mining pollution? 1. Yes 2. No

13.31. If yes mention the dept./NGO name and their activities in this connection……..

13.32. Have you heard about CAMPA fund? 1. Yes 2. No

13.33. Is forest dept called any meeting in your village to discuss anything relating to CAMPA? 1. Yes 2. No

13.34. If yes, have you attended? 1. Yes 2. No

13.35. If yes, mention details about discussion.

13.36. Does the forest dept doing any plantation in your area? 1. Yes 2. No

13.37. If yes, do they consult you or your villagers before plantation? 1. Yes 2. No

13.38. Do the plants they are planting is in a position to restore your forest based livelihoods? 1. Yes 2. No

13.39. Can you recall the percentage of survival of plants planted by Forest Dept. in your locality? 1. 100% 2. More than 75% 3. More than 50% 4. More than 25% 5. None

13.40. Does forest dept. organize any awareness programme relating to wildlife conservation and afforestation in your area? 1. Yes 2. No

13.41. Does the forest department doing anything else apart from plantation activities in your area? 1. Yes 2. No

13.42. If yes, mention the activities.

13.43. Is there any NGO working in your locality? 1. Yes 2. No

13.44. If yes, on what aspect they are working?

1. Health 2. Environment 3. Plantation

4. Rural development 5. Agriculture 6. Microfinance

13.45. Do you have any SHGs in your village? 1. Yes 2. No

13.46. If yes, are you a member of it? 1.Yes 2. No

13.47. Does any NGO help you in becoming a member of that SHG? 1. Yes 2. No

13.48. If yes, mention the name of NGO……

13.49. Is there any Govt. tribal department working in your locality?

1. Yes 2. No 3. No idea

13.50. If yes, on what aspect they are working?

1. Health 2. Environment 3. Plantation

4. Rural development 5. Agriculture 6. Microfinance

13.51. Are you getting any special facility from this department? 1. Yes 2. No

13.52. If yes, please mention.

SECTION 14: MINING AND SOCIAL STRUCTURE

14.1. What type of family do you have?

1. Joint family 2. Nuclear family 3.Extended family 4.Others (specify).....

14.2 Can you remember what type of family system do your forefathers had?

1. Joint family 2. Nuclear family 3.Extended family 4.Others (specify).....

14.3. Could you please explain why are you moving towards this type of family system, if any?

14.4. Where your other lineages are living at present?

1. Nearby village 2. Same village 3. Don't know 4. MCL quarter 5.Others (specify).....

14.5. Are you continuing the relation with your family members who are not staying with you?

1. Yes 2. No

14.6. If yes, mention in what way you are maintaining the relation.

14.7. If no, mention the reason.

14.8. What kind of dealings do you have with your neighbour?

1. Formal 2.Informal 3. Don't knows 4. Others (specify).....

14.9. What form of marriage do you prefer?

1. Arrange Marriage 2. Love Marriage 3. Others (specify)....

14.10. How could you explain marriage?

1. Social bond 2. A religious sacrament 3. A social security

4. An imposition 5. Others (specify).....

14.11. Does anybody in your house did love marriage? 1. Yes 2. No

14.12**.** If yes, was there any controversy held during that time? 1. Yes 2. No

14.13**.** If yes, how you handled this situation?

14.14. If no, why?

14.15. Whom do you marry? 1. Unknown person 2. Known person 3.Relative

14.16. If the case of relatives' marriage found, is it the tradition? 1. Yes 2. No

14.17. If no, why you prefer now days?

14.18**.** Marriage System

Category	Pre Mining	Post mining
Age at marriage~		
Decision making*		
Caste endogamy#		
Clan Exogamy@		
Distance of marriage+		
Dowry system^		

Codes Used:
~ Below 18(1), Below 25 (2), Above 30 (3), More than 30 (4)
**Common (1), Collective (2), Individual (3)*
#Within Caste (1), Inter caste (2), No such restriction (3)
@Outside the clan (1), within the clan (2), No such restriction (3)
+Same village (1), Nearby village (2), Within the block (3), Within the district (4), No such restriction (5)
^High dowry system (1), Left to the bride's home (2), No dowry system (3)

14.19. What are the festivals do you observed at your village level before mining?

14.20. Are you continuing the same in present days? 1. Yes 2. No

14.21. If no, mention the reason?

14.22. If yes, are you celebrating with same spirit? 1. Yes 2. No

14.23. If no mention the reasons.

14.24. What are festivals do you observe at the household level?

14.25.. Is there any change in celebrating those festivals in now days? 1. Yes 2. No14.26**.** If yes, explain

14.27. Impact on Work and Labour

14.28 Impact on Social

Category	Type of Labour		Farming Type		Black Market		If C3 is Yes (Reason Behind)		Division of labour	
	Kin Labour	Hire Labour	Permanent	Drifting	Yes	No	Pre-mining	Post-mining	Yes	No
Pre-mining										
Post-mining										

Leisure time if any		Leisure time work	Any impact on surname		Ancestral worship	
Yes	No	a.	Yes	No	Yes	No
		b.				
		c.				
		d.				
		e.				

work

14.29. Impact on economic steadiness

Sl. No.	Activities	Yes/No	Causes (If C3 is Yes)	Tick all that apply
1.	Jajmani system		a. Expansion of market economy	
			b. Transformation of culture	
			c. Mechanisation of agriculture	
			d. Introduction of contractual labour system	
			e. All of the above	
			f. Others (specify).....	
2.	Positive/negative impact on agricultural production		a. Pollution	
			b. Non-availability of pesticides	
			c. Unavailability of collective input	
			d. Fragile agricultural land	
			e. Others (specify).....	
3.	Financial deficiency		a. Loss of agricultural land	
			b. Unequal distribution of land	
			c. Addiction of any kind (specify)..	
			d. Others (specify).....	
4.	Crop theft		a. Growth of market structure	
			b. Expansion of financial condition	
			c. Poverty	
			d. Unemployment	
			e. Others (specify)	

14.30. Migration detail

Before Mining			After Mining		
No. Migrated	Place of migration	**Income**	**No. Migrated**	Place of migration	**Income**

PC-HOUSEHOLD SCHEDULE (Control village)

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
HOUSEHOLD SCHEDULE
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

Name of the Respondent: Sex:

Age: Caste/Tribe: BPL/APL:

SECTION 1: GENERAL

1.1. Geographic Information

State		District		Block	
G.P.		Village		Distance from the mine	

1.2. Household composition (Include members who stay permanently)

Sl. No.	Name (Start with head of House Hold)	Relation with HH	Sex (Male-1/Female-2)	Age*	Marital Status	Educational Qualification	Main Occupation	Subsidiary Occupation	Current Annual Income (Rs)
1									
2									
3									
4									
5									
6									
7									

* Enter the completed age (for less than one year age = 00, 98 years and above =98) or
Date of birth after verifying records

Codes used:

Relationship with HoH (Column 3): Self-HoHH-1/Spouse-2/Father-3/Mother-4/Father-in-law-5/Mother-in-law-6/Uncle-7/Aunt-8/Brother/Brother-in-law-9/Sister/Sister-in-law-10/Son/Son-in-law-11/Daughter/Daughter-in-law-12/Nephew-13/Niece-14/Own grandchildren-15/Sibling's grandchildren-16/Cousin (brother)-17/Cousin (sister)-18/Live-in domestic help-19/Others (specify)-20
Marital Status (Column 6): Married (1), Unmarried (2), Divorcee (3), Widow/Widower (4), Separated/Deserted (5)
Educational Qualification (Column 7): Illiterate (1); Literate (2); Primary (3); Middle (4); Matriculate (5); Intermediate (6); Graduate and above (7); Professional qualification (Specify)(8); other (Specify)(9)

Occupation (Column 8 & 9): Cultivation-1/Dairy-2/Fishery-3/Goatery & other animal rearing-4//Daily Wages-Agricultural Labourer-5/Skilled Wage Labourer-6/Semi or Unskilled Wage Labourer-7/Service-Private Sector-8/Service-Government-9/Trade/Business-from fixed premises-10/Owner of SSI/Cottage Industry-11/Other Self-employed-12/Professionals-13/Household Industry-14/Artisan-15/Vendor(Cycle/Pheri wala)-16/Others (Specify)-17

SECTION 2: LIVELIHOOD

2.1. Source of Family Income

Sl. No.	Sources of work	Number of family members engaged	Nature of work		Annual income in rupees
			Continuous (1)/ Seasonal (2)	Duration of work	
1.	Agriculture				
2.	Wage labour (Farm)				
3.	Wage labour (Non-farm)				
4.	Employment (Govt.)				
5.	Employment (Pvt.)				
6.	Employment (MCL)				
7.	Common Property Resources				
8.	Business				
9.	Dairy/Livestock				
10.	Fishery				
11.	House rent				
12.	Others (Specify)				
	Total				

Duration of work: 1. Less than 100; 2. 100-150 days; 3. 150-200 days; 4. 200-250 days ; 5. Above 250 days.

2.2. Housing and other amenities

Housing and other amenities		Status
House type	1-Pucca/ 2-Semi-Pucca/ 3-Kutcha/ 4-Hut/ 5-Temporary	
Sanitation	1-yes, 2-no	
Kitchen room	1-Separate/2-Attached	
Cow shed	1-Separate/2-Attached	
Main Cooking fuel	2- Wood, 2-charcoal,3-kerosine, 4-Cow dung, 5-Gas	
Main source Drinking water	1-Tube well, 2- open well, 3-stream, 4-pond	
Cow shed	1-yes, 2-no	

2.3. Ownership of Asset

Particulars	(Yes,1; No,2)	Number	Particulars	(Yes,1; No,2)	Number
Cycle			Bullock cart		
Motor cycle/scooter			Fridge		
Tractor			Radio		
Pump sets-deasel/elec			TV		
Plough			Music System		
Others					

2.4 Migration detail

No.	Place of migration	Income

SECTION 3 : AGRICULTURE

3.1. Land Holding Particulars

Area (in Acres)			
Area Owned *	**Area leased in**	**Area Leased out**	**Net sown area•**

* Area Owned = Total Area – Home Area
Net sown area/Net operated area = Area Owned + Area leased in – Area leased out

3.2. Changes in cropping pattern in last 10 years

Season	Name of the Crop			Area cultivated (in acre)			Production (in Quintal)		Price	
	Before	After	Reason for change	Before	After	Reason for change	Before	After	Before	After
Kharif										
Rabi										

3.3. Costs of Cultivation per Acre

Sl. No	Item	Kharif	Rabi
1	Crop Name (main)		
2	Cost on seed (Rs)-**per acre**		
3	Cost on Labour (Rs)		
4.	Cost on fertilizer & pesticide (Rs)		
5.	Cost on seed (Rs)		
6.	Cost of irrigation (Rs)		
7.	Cost on Plough (Rs)		
8.	Total Cost		

3.4. Are you getting adequate water for your agriculture? 1. Yes 2. No

3.5. If no state the reason

1. Water got polluted 2. Mining industry consume all water 3. Water table reduced
4. No good rain fall 5. Water waste 6. Other……..

3.6. Do you think the same amount of ecofriendly insects which increase fertility capacity of land available in your locality? 1. Yes
2. No

3.7. Are you cultivating the entire land you possess? 1. Yes 2. No

3.8. If no explain why?

1. Loss of productivity of land 2. Unavailability of labour 3. Lack of water

4.Field with coal dust 5. High cost 6.other……..

3.9. Estimation of Damage Cost

Si.no	Items damaged	Cost in rupees
1	Pump sets	
2	Bore well/Tube well	
3	Vehicles	
4	Other machineries	
5	land became uncultivable	
6	Total	

SECTION 4 : STATUS OF BIODIVERSITY

4.1. Have you observed any kind of change in local biodiversity? 1. Yes 2. No.

4.2. If yes explain
1. Loss of flora 2. Loss of fauna 3. Polluted local environment

4.Loss of habitat 5. Change in water table 6. All above

4.3. If yes, are you aware about the reason for this loss? 1. Yes 2. No

4.4. If yes explain
1. Dust has covered tree 2. Reduced water quality 3. Development activities
4. Any other

4.5. Is there any loss to local grazing land? 1. Yes 2. No 3. Not Much

4.6. Are you getting much fodder for your livestock? 1. Yes 2. No

4.7. What are the MFP you used to collect from local forest earlier?

4.8. Are you getting the same MFP which you used to collect from forest earlier?
1. Yes 2. No

4.9. If no, what happen to all these products?

1. Loss of forest 2. Loss of forest based productivity 3. Loss of control

4. 5. 6.

4.10. Explain about the loss of herbal medicines and its implication

4.11. Do you have recognized any change in the case of flower trees in the context of time and season of flowering? 1. Yes 2. No

4.12. If yes, can you explain?

1. Some flowers are not blooming 2. Some are in different season 3. Any other

4.13. Do you think that there is a loss to some animals which used to be seen in your local forest?

1. Yes 2. No

4.14. If yes explain about those animals

4.15. Annually how much resource you are receiving from forest resources?.....

SECTION 5 : STATUS OF WATER

5.1. Facility of Water

Use of Water (Put codes)	Source of Water*			Distance of water source**			No of sources***		
	R	W	S	R	W	S	R	W	S
Drinking									
Washing/Bathing									
Cattle/Livestock use									
Irrigation									

@S-Summer, W-Winter, R-Rainy season

**Own well-1/Community well-2/Own Tube well/Hand pump-3/Community Tube well/ Hand pump-4/Stream-5/River-6/Tank-Pond-7/Other (specify)-8*

*** Within house-1/Less than 100 meters-2/100-250 meters-3/250-500 meters-4/500 metres-1 Km-5/1 Km – 2 Km-6/2 Km – 5 Km-7/More than 5 Km-8*

**** 1.1-2; 2.2-3; 3.3-4; 4.4-5; 5. More than 5*

5.2. Who is involved in fetching of water? 1. Man 2. Woman 3. Children 4. All 5. W&C

5.3. How much time a house hold is spending to fetch water?

1. ½ hour 2. 1 hour 3. 1-2 hour 4. Above 2

5.4. Do you feel there is scarcity of water for domestic use? 1. Yes 2. No

5.5. If yes then explain why and how?

5.6. Is there water pollution in your locality? 1. Yes 2. No

5.7. What are the sources of water pollution?

1. Mining water going to river 2. No recycling 3. Dumping ash
4. People taking bath 5. 6.

SECTION 6 : HEALTH SCENARIO

6.1. In your opinion, which one of the following best describes your current health status:
1. Excellent 2. Good 3. Fair 4. Poor

6.2. In your opinion what are the major health problems you are facing?
1. Eye Allergy 2. Skin disease 3. ARI 4. Malaria 5. Gastro
6. Arthritis 7. Fever 8. TB 9. Asthma

6.3. How frequently you are suffering from various diseases?

1. Daily 2. Weekly 3. Monthly 4. Yearly

6.4. Which system of medicine you are taking?

1. Allopathic, 2. Ayurveda, 3. Homeopathic, 4. Home remedies, 5. Any other (specify)

6.5. How much you are spending on health issues annually?
1. Within 1 thousand 2. Within 5 thousand 3. 5-10 thousand 4. Above 10 thousand

SECTION 7: LIVESTOCK

7.1. What types of problems livestock are facing?

1. Diseases
2. Weakness
3. Decline in productivity
4. Decline in quality and quantity of manure
5. Death
6. Any other

7.2. Was there any cattle diseases found during past years? 1. Yes 2. No

7.3. How did it start?
1. Grazing contaminated grass 2. Drinking polluted water 3. Any others

7.4. How much you spent on their health?

1. 1-Rs. 500 2. 500-Rs.1000 3. 1000-Rs.2500 4. 2,500-Rs.5000 5. Above 5 thousand

7.5. Have you received any support from any agency or department for the betterment of Livestock? 1. Yes 2. No

7.6. If yes, please mention from where you got support and what?

1. FD. 2. NGO 3. Panchayat 4. RD 5. TD 6. Other Govt. dept.

7.7. Ownership of Livestock

Livestock	No.	Livestock	No.
Cow		Goat	
Buffalo		Sheep	
Ox		Poultry birds	
Others (Specify)		Others (Specify)	

SECTION 8: GENERAL INFORMATION ABOUT DEVELOPMENT ACTIVITIES

8.1. Do you have BPL card? 1. Yes 2. No

8.2. If no, have you approached any officials from your GP? 1. Yes 2. No

8.3. What was their reply?

8.4. If yes, who helped you in getting it?

1. GP 2. BDO 3. Friend 4. Relatives, 5. NGO

8.5. Have you received Indira Abas? 1. Yes 2. No

8.6. Who helped you in getting it? 1. GP 2. BDO 3. Friend 4. Relatives 5. NGO

8.7. Do you have Job card? 1 Yes 2 No

8.8. Who helped you in getting this card?

1. Panchayat office 2. Friend gave 3. BDO 4. Any other

8.9. Have you ever received any work under this programme? 1. Yes 2. No

8.10. If yes, how many days in a year?

1. 1-50 2. 50-100 3. 100-150 4. 150-200 5. 200-250 6. 250 & Above

8.11. If no, why:? 1. No work 2. No information 3. Work for their own people

4. 5. 6.

8.12. Have you ever approached for any work…… 1. Yes 2. No

8.13. If yes, whom you approached?

1. Sarapancha 2. Panchayat Secretary 3. Ward member 4. Gram sathi
5. Somebody else (specify)……

8.14. Does anybody at your home receiving Old age pension: 1. Yes 2. No

8.15. Have you received any training towards the enhancement of agricultural production?
1. Yes 2. No

8.16. If yes, who gave you such training?
1. GP 2. NGO 3. Tribal dept 4. Agricultural Dept. 5. Any other……

8.17. Do you have any SHGs in your village? 1. Yes 2. No

8.18. If yes, are you a member of it? 1.Yes 2. No

SECTION 9: SOCIAL STRUCTURE

9.1. What type of family do you have?
1. Joint family 2. Nuclear family 3.Extended family 4.Others (specify).....

9.2 Can you remember what type of family system do your forefathers had?
1. Joint family 2. Nuclear family 3.Extended family 4.Others (specify).....

9.3. Could you please explain why are you moving towards this type of family system, if any?

9.4. Where your other lineages are living at present?
1. Nearby village 2. Same village 3. Don't know 4. MCL quarter 5.Others (specify).....

9.5. Are you continuing the relation with your family members who are not staying with you?
1. Yes 2. No

9.6. If yes, mention in what way you are maintaining the relation.

9.7. If no, mention the reason.

9.8. What kind of dealings do you have with your neighbour?
1. Formal 2.Informal 3. Don't knows 4. Others (specify).....

9.9. What form of marriage do you prefer?
1. Arrange Marriage 2. Love Marriage 3. Others (specify)....

9.10. How could you explain marriage?
1. Social bond 2. A religious sacrament 3. A social security
4. An imposition 5. Others (specify).....

9.11. Does anybody in your house did love marriage? 1. Yes 2. No

9.12**.** If yes, was there any controversy held during that time? 1. Yes 2. No

9.13**.** If yes, how you handled this situation?

9.14. If no, why?

9.15. Whom do you marry? 1. Unknown person 2. Known person 3.Relative

9.16. If the case of relatives' marriage found, is it the tradition? 1. Yes 2. No

9.17. If no, why you prefer now days?

9.18**.** Marriage System

Category	
Age at marriage~	
Decision making*	
Caste endogamy#	
Clan Exogamy@	
Distance of marriage+	
Dowry system^	

Codes Used:
~ Below 18(1), Below 25 (2), Above 30 (3), More than 30 (4)
**Common (1), Collective (2), Individual (3)*
#Within Caste (1), Inter caste (2), No such restriction (3)
@Outside the clan (1), within the clan (2), No such restriction (3)
+Same village (1), Nearby village (2), Within the block (3), Within the district (4), No such restriction (5)
^High dowry system (1), Left to the bride's home (2), No dowry system (3)

9.19. What are the festivals do you observed at your village level earlier days?

9.20. Are you continuing the same in present days? 1. Yes 2. No

9.21. If no, mention the reason?

9.22. If yes, are you celebrating with same spirit? 1. Yes 2. No

9.23. If no mention the reasons.

9.24. What are festivals do you observe at the household level?

9.25. Is there any change in celebrating those festivals in now days? 1. Yes 2. No

9.26**.** If yes, explain

Category	Type of Labour		Farming Type		Black Market		If C3 is Yes (Reason Behind)		Division of labour	
	Kin Labour	Hire Labour	Permanent	Drifting	Yes	No	Pre-mining	Post-mining	Yes	No

9.27. Impact on Work and Labour

Leisure time if any		Leisure time work	Any impact on surname		Ancestral worship	
Yes	No	a.	Yes	No	Yes	No
		b.				
		c.				
		d.				
		e.				

9.28 Impact on Social work

9.29. Impact on economic steadiness

Sl. No.	Activities	Yes/No	Causes (If C3 is Yes)	Tick all that apply
1.	Jajmani system		a. Expansion of market economy	
			b. Transformation of culture	
			c. Mechanisation of agriculture	
			d. Introduction of contractual labour system	
			e. All of the above	
			f. Others (specify).....	
2.	Positive/negative impact on agricultural production		a. Pollution	
			b. Non-availability of pesticides	
			c. Unavailability of collective input	
			d. Fragile agricultural land	
			e. Others (specify).....	
3.	Financial deficiency		a. Loss of agricultural land	
			b. Unequal distribution of land	
			c. Addiction of any kind (specify)..	
			d. Others (specify).....	
4.	Crop theft		a. Growth of market structure	
			b. Expansion of financial condition	
			c. Poverty	
			d. Unemployment	
			e. Others (specify)	

****

Village schedule

NATIONAL INSTITUTE OF TECHNOLOGY

Rourkela, Odisha – 769008

DRAFT VILLAGE SCHEDULE

Coal Mining, Displacement and Rural Livelihoods

(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Identification

Name of the Village _____,G.P. _____

Block _____,Sub-Division _____

Tahesil _____,District _____

2. Location

Sl. No.	Particulars	Distance	Si. No.	Particulars	distance
2.1	G.P. HQ		2.10	Electric Sub-station	
2.2	Bloci HQ		2.11	Anganwadi Centre	
2.3	District HQ		2.12	Primary School	
2.4	PHC HQ		2.13	Middle School	
2.5	Nearest Bank		2.14	High School	
2.6	Post Office		2.15	College	
2.7	Bust Stop		2.16	Health Centre	
2.8	Daily Market		2.17	Police Station	
2.9	Weekly Haat		2.18	Railway Station	

3. Demographic Data

Hamlet	Hindu	Muslim	Christian	Others	Total	SC	ST	OBC	General	Total	Male	Female	BPL	Landless

Total														

4. Village Information

Sl. No.	Infrastructure	Nos.	Present Condition	Impact of Project (Yes/No)
1.	School			
2.	Hand Pump			
3.	Sanitary Dug well			
4.	Pond			
5.	River			
6.	Nala			
7.	Million Well			
8.	ICDS Centre			
9.	Health Sub-center			
10.	Road			
11.	Bore Well			
12.	Water Harvesting Structure			
13.	Grain House			
14.	Youth Club			
15.	Commercial Bank			
16.	Cooperative Society			
17.	Temple village deities			
18.	Burial Place			
19.	Others			

5. Access to CPR during Pre and Post Mining period

CPR	Availability (Yes/No)		Accessibility*	
	Pre- Mining	Post-Mining	Pre- Mining	Post-Mining
Electricity				
Village pond (Specify Nos.)				
Common wells (Specify Nos.)				
Tube-well (Specify Nos.)				
River				
Water Stream				

Community Forest (Specify Nos. & Area)				
Reserve Forests (Specify Nos. & Area)				
Cremation ground (Specify Nos.)				
Grazing grounds (Specify Nos. & Area)				
Threshing grounds (Specify Nos. & Area)				
Defecation grounds				
Temple/Mosque/Church				
Open air shrines				
Holy grooves				
Bhaghat Tungi (place for recitation of Bhaghat)				
Kotha ghar/Community Hall (Specify Nos.)				
Others (Specify)				

*Specify accessibility to oustees/resettlers, all castes/ religion

6. Land Use Pattern besides Agriculture (Areas in Acres)

Land	Pre-Mining		Post-Mining	
	Yes/No	Area	Yes/No	Area
Grazing Land				
Cremation ground/Burial ground				
Fallow Land				
Community Forest				
Common Field				
Play Ground				
Threshing grounds				
Private Land				
Abad Jyogya Anabadi (AJA)				
Abad Ajogya Anabadi (AAA)				
Any Others (Specify)				

7. Social Capital & Associations

Groups	Pre-Mining			Post-Mining		
	Yes/No	Number	Activities Yes/No	Yes/No	Number	Activities Yes/No
Women's Group (Mahila Mandal)						
Farmers Group(Palli Shrota Mandali)						
Youth Club						
Self Help Group						
Milk cooperatives						
Cultural Group						
Caste/Tribe Panchayat						

8. Land Holding

Sl. No.	Land Holding Category	Land Holding Patta Land (in acre)									
		Pre- Mining					Post-Mining				
		SC	ST	OBC	GC	Total	SC	ST	OBC	GC	Total
1.	Land less										
2.	Marginal (up to 2.5 Acre)										
3.	Small (2.5-5 Acre)										
4.	Medium (5-10 Acre)										
5.	Large (Above 10 Acres)										
Total											

9. Has the Project affected the functioning of these groups? 1. Yes 2. No

10. If yes state what are the reasons (briefly)

11. Is there any NGOs working in this village? 1. Yes 2. No

12. If yes, mention their names and activities

13. Do you feel those NGOs are working anything for the mitigation of mining problems?
1. Yes 2. No
14. If yes mention those activities

15. Are there any governmental activities taking place in your village? 1. Yes 2. No

16. If yes, what are they?

17. If no, mention the reason,

CSR Schedule

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
SCHEDULE FOR MCL (CSR)
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..

2. Sex……1. Male 2.Female

3. Department/Position……..……..

4. How long have you been with MCL? 1. 0 – 4 years 2. 4 – 10years 3. 10 years and above

5. How long has MCL been involved in corporate social responsibility? (specify)……

6. Is social responsibility activities incorporate into your organization's policy? 1. Yes 2. No

7. Is MCL totally committed to corporate social responsibility? 1. Yes 2. No

8. Has your company adopted and implemented a code of ethics? 1. Yes 2. No

9. Do your organizations consider its immediate enrolment in corporate social responsibility activities? 1. Yes 2. No

10. Do you appreciate the engagement of stakeholders in your CSR agenda? 1. Yes 2. No

11. Have you ever changed your CSR activities because of stakeholder pressure? 1. Yes 2. No

12. Does your corporate social responsibility project come up as a result of pressure from Government or immediate environment where your organization operates? 1. Yes 2. No

13. Does government intervene in your corporate social responsibility activities? 1.Yes 2. No

14. If Yes, how often? 1. Very often 2. Quite often 3. Often 4. Not often

15. Does your organization invite some members of the host community for consultation in matters relating to Corporate Social Responsibility? 1. Yes 2. No

16. How do you put CSR into practice within your company?
    1. Own projects 2. Sponsoring/Philanthropy Research

3. Own Foundation 4. Other (please specify)

17. Do you have proper R& R policy 1. Yes 2. No

18. If yes, collect a copy

19. Do you have any CSR sectorial Policy? 1. Yes 2. No

20. What are those sectors on which your company's Corporate Social Responsibility initiatives are taken up?

1. Education 2.The arts 3. Public health 4.Social investment 5. Sports
6. Micro-credit-projects 7.Environment 8.Others (please specify):

21. On which sector of CSR activity you are giving more importance?

1. Education 2.Arts & entertainment 3.Roads 4.Public health
5. Environment 6.Others (specify),…….

22. What percentage of your company's pre-tax profits is spent on (CSR) projects?.....

23. Are there any Govt. guidelines that make you mandatory to spend so much % on CSR?

1. Yes 2. No

24. Are the CSR activities within your company regionally/locally controlled or does your corporate headquarters control all your CSR initiatives?

1. Headquarter 2.Regional/local 3.Other (please specify):

25. Is your CSR strategy standardized or does it operate/vary regionally?

1. Standardized 2.Varies regionally 3.Other (please specify):

26. Are you committed in providing rehabilitation packages to the displaced households?

1. Yes 2. No

27. How many households are being displaced due to your project in Talecher region

……..

28. Does the family displaced got proper rehabilitation? 1. Yes 2. No

29. If yes, Explain the process

30. If no, mention the reasons

31. How many of them are yet to receive the rehabilitation facility? …….

32. Have you faced agitation from the public due to the displacement issues? 1. Yes 2. No

33. How you dealt with this?

34. Have you provided all the basic amenities in displacement/rehabilitation colonies?
1. Yes 2. No

35. Have you taken any steps to avoid natural disasters in your project site? 1. Yes 2. No

36. If yes, explain the process,

37. Does the company believe that it has gained benefits as a result of its activities in the surrounding community? 1. Yes 2. No 3. Partially

38. Does the company carry out educational and public interest campaigns in the community together with local organizations? 1. Yes 2. No 3. Partially

39. Does your company encourage its employee to do volunteer work?
1. Yes 2. No 3. Partially

40. Does your company carry out research on potential risks its product and services may cause to local communities' health and safety? 1. Yes 2. No 3. Partially

41. What are the key environmental issues of most concern to your company?

42. What are the industrial wastes generated from your industry and how you are utilizing those waste?

43. What steps you have taken to reduce the high level of toxicity that produced from waste materials which harms aquatic plants, wildlife, and other organisms.

44. What steps you have taken to reduce the environmental damages that resulted due to tailing, waste rocks, and acid leaching.

45. Describe the measures taken by your organization in managing environmental damage that results from the use of vehicles and machinery within the mining area (e.g. on the landscape in general, soil, vegetation, noise, dust, etc.).

46. What steps you have taken in controlling the movement of vehicles and machinery in order to minimize environmental damage?

47. Have you done a separate road/track for the movement of your vehicle? 1. Yes 2. No

48. What steps you have taken to stop landslides and soil erosions in your project areas?

49. Are you doing any blasting on your mining site? 1. Yes 2.No 3. Unsure

50. If yes, how many times a day? 1. Once 2. Twice 3. Thrice 4. Others (specify)

51. If yes, explain how you are minimizing the environmental impacts, including the safety of humans, livestock and wildlife?

52. Have you taken any step to monitor the ambient Air Quality near your project sites?

1. Yes 2. No

53. What is the frequency of its monitoring?
1. Once a month 2. Twice a month 3. Half yearly 4. Yearly 5. Others (specify)

54. What are the mitigation measures taken to protect from environmental effect due to mining? (attached if any printed things available)

55. Does your organization have taken care of the ten principles of the United Nations Global Compact while doing mining activities?
1) Yes 2) No 3) Not sure

56. If 'yes' explain in what way they have taken care of it? (attached a separate copy)

57. Where are you getting water for your mining operation?
1) Tank 2) River 3) own borehole 4) Any other source

58. Where are you disposing your waste water every day?.....

59. Is the place away from human and animal habitation? 1. Yes 2. No

60. Have you taken any steps in water saving? 1. Yes 2. No

61. What are the major steps you have taken for water saving?

62. What are the methods you have adopted in minimizing and avoiding polluting any water source, including underground water?

63. Have your organization has taken any steps in providing safety water for drinking and domestic use? 1. Yes 2. No

64. What are the steps you have taken in providing safety drinking water to the mining affected villagers?

65. Do you feel the mining activities in this area have restricted the movement of other people in the area (e.g. the general public, tourists, farmers, local people, etc.)?

1. Yes 2. No 3. Not sure

66. If yes, do you feel it has some impact on the entire activities?

1. Yes 2. No 3. Not sure

67. If yes, explain the impact

68. Do you feel your activities have brought an unnecessary damage to plants and wildlife in or near your mining claim) e.g. accident, hunting, plant collecting, fishing, etc.)?

1. Yes 2. No 3. Not sure

69. If yes explain the impact

70. What are the steps your organization has taken in protecting those?

71. Are there any historical, archaeological or culturally important sites within your mining area? 1. Yes 2. No 3. Not sure

72. If yes, please describe briefly

73. If such sites are known, what steps your organization has taken in avoiding damaging to them?

74. Is MCL doing anything to address the health needs of the community? 1. Yes 2. No

75. If yes, mention about those activities

76. Has MCL built any health facility center in this community for the service of both workers and people in the community? 1. Yes 2. No

77. Type of medical facilities provided.
    1. Free medical facility 2. Only medicine providing 3. Health facilities through camps
    4. Providing all types of medicines 5. Only expenditure if admitted 6. Subsidized
    7. Both medicine and admitted expenditure

78. Emergency aid provided
    1. Ambulance 2. Health center 3. Fire extinguisher 4. Para-medical service
    5. Blood bank

79. Steps taken for cleanliness of community
    1. Door to door garbage collection 2. Closed drainage 3. Regular cleaning of roads
    4. Separate vending zones 5. All 6. Any other……

80. Recreational facilities
    1. Shopping complex 2. Cinema halls 3. Parks
    4. Magic or any stage show 5. Celebration of local festivals

81. What steps being taken for the sports activities?

82. If yes, mention those activities

83. Methods of child development
    1. Schools and colleges 2. Playground 3. Conducting science exhibition
    4. Providing scholarship 5. Conducting cultural programme

84. What kind of steps MCL has taken to provide better educational facilities
    1. Primary school 2. Primary & secondary school 3. College
    4. Technical institute 5. Vocational education

85. Have you taken up any programme for the empowerment of women? 1. Yes 2. No

86. If yes, mention details.

87. Have you received any cases held against the safety of women in your project area?
    1. Yes 2. No

88. If yes, can you recall those cases?

89. What steps you have taken for the safety and betterment of women in your project area?

90. Have you formed any women SHGs in your project area? 1. Yes 2. No

91. If yes, what are the activities they are doing?

92. Are you providing some training and exposer to them? 1. Yes 2. No

93. What methods you adopted for microfinance activities in your project affected areas?
    1. Setting of co-operatives 2. Loans for house building, health and social activities
    3. Pension 4. All 5. Any other……..

94. Are you organizing any special activities at the household level for their income growth?
    1. Yes 2. No

95. If yes, what are the activities you are doing?

96. Are undertaking some programme for the skill up gradation of poor villagers? 1. Yes 2. No

97. If yes, mention those programmes.

98. Are you undertaking any activities for the institutional building in local areas.? 1.Yes 2. No

99. Have you formed any youth club in your project areas? 1. Yes 2. No

100. If yes, what are the activities those clubs are doing?

101. Is there any provision for Community Centre at every mining affected village? 1. Yes 2. No

102. Provisions for senior citizens
    1. Retired Associations
    2. Health clubs
    3. Community Centers
    4. Parks
    5. Health Camps
    6. Any other……

103. Have you undertaken any activities in providing better road communication to villagers in the project affected areas? 1. Yes 2. No

104. If yes, mention the activities details.

105. Do you feel your intervention has disturbed the villagers' relation with forest?
    1. Yes 2. No

106. If yes, what steps you have taken to rebuild that relationship?

107. Does your organization doing something for the protection of local cultures?
    1. Yes 2. No

108. If yes, what are activities you are carrying out?

109. Are you taking any major steps for the protection and conservation of wild life in your project affected areas? 1. Yes 2. No

110. If yes, what are those activities?

111. Are you taking any actions if anybody violate the principles regarding wildlife conservation?
1. Yes 2. No

112. If yes please mention.

113. Are you taking care of stakeholders interests while doing these activities? 1. Yes 2. No

114. What steps you have taken to address the issues pertaining to prevention and mitigation of land degradation in the project affected areas?

115. Have you evolved any mechanism which will improve the living standards of the affected population? 1. Yes 2. No

116. If yes, please mention.

117. What steps MCL has taken to restore the ecological resilience in mining areas?

118. Are you doing any plantation activities near your project area? 1. Yes 2. No

119. If yes, in last five years how many hectares you covered?.....

120. What are the plants you are planting?

121. Have you ever noticed people's satisfaction regarding plantation?

122. Where are you doing the plantation activities?
1. Near project sites 2. Within the same block 3.Within the same district
4. In the nearby district 5. Others (specify):

123. What is the percentage of survival rate of these plants?.....

124. Do you feel the plants you planted will meet the livelihood needs of the villagers?
1. Yes 2. No

125. Have you consulted the villagers before planting those plants? 1. Yes 2. No

126. Had you involved villagers in plantation activities? 1. Yes 2. No

127. Do you feel communities residing in those areas are quite happy with your CSR activities?
1. Yes 2. No

128. Have you submitted the CAMPA fund to the Govt.? 1. Yes 2. No

129. Do you feel the Govt. has properly utilised the CAMPA fund which MCL submitted?
1. Yes 2. No

130. If yes, state how?

131. If no, give your comments and suggestions

132. Have you received any award from The Federation of Indian Mineral Industries (FIMI) in last 10 years? 1. Yes 2.No

133. If yes, mention the award name……..

134. If you have received any award for your CSR activities from any source kindly mention ……..

135. Can you give the trends of investment you did in various sectors in last 20 years In your project affected areas as a part of CSR activities?

Amount Spent on CSR Activities by MCL in 20 Years (in Lakhs)

Activities	sambalpur	Talcher	Jharsuguda	Bhubaneswar	Other places	Total Amount
Road Infrastructure						
Drinking Water						
Education						
Community Development, Public Building, parks, etc						
Culture, Sports & Social Welfare						
Health & Sanitation						
Plantation/Environment						
Any other						
Total						

Questionnaire on Campa Fund-State Level

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
SCHEDULE FOR FOREST DEPT (STATE LEVEL) REGARDING CAMPA FUND
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..
2. Sex…… 1. Male 2.Female
3. Department/Position……..……..
4. Since how many years you are in this position?

   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years
5. Since how many years you are dealing with CAMPA fund?

   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years
6. Are you aware about the CAMPA guidelines? 1. Yes 2. No
7. If yes, are you following the same while dealing with this? 1. Yes 2. No
8. What is your role in the utilization of CAMPA Fund?

9. Do you have formed all the three committee for the functioning of State CAMPA?

   1. Yes 2. No
10. If yes, can you kindly give the details? (please attach)
11. How frequently the Governing Body of State CAMPA meets in a year?

    1. Once 2. Twice 3. Thrice 4. More than thrice
12. How frequently the Steering Committee of the State CAMPA meets in a year?

    1. Once 2. Twice 3. Thrice 4. More than thrice
13. How frequently the Executive Committee of State CAMPA meets in a year?

    1. Once 2. Twice 3. Thrice 4. More than thrice
14. Does the Executive Committee of State CAMPA do the audit of CAMPA fund utilization regularly? 1. Yes 2. No
15. Does the Executive Committee of State CAMPA prepare annual report regularly?

    1. Yes 2. No

16. If you have not formed any committee, mention the reason?

17. How much amount has been collected for state CAMPA fund since 2009? (kindly contribute year wise information in a separate paper)

18. Who contributes for the CAMPA fund? 1. Corporate 2. Govt. 3.Others (Specify)

19. What is the contribution of MCL to CAMPA fund?

20. Amount demanded and Received by Odisha government

	2009-10	2010-11	2011-12	2012-13
Money Demanded to ad-hoc CAMPA				
Money Received from the ad-hoc CAMPA				

21. Have you spent entire money you received last year? 1. Yes 2. No

22. Are you submitting utilization certificate regularly to the central CAMPA? 1. Yes 2. No

23. Is there any special audit or performance audit of State CAMPA held by State Govt. or MOE & F? 1. Yes 2. No

24. How do you estimate the annual budget for utilization of CAMPA fund?

25. Who are the stakeholders involved in finalizing this annual plan of operation (APO)?

26. Is there any involvement of local community in preparing this plain? 1. Yes 2. No

27. If no why?

28. Is there any involvement of local NGOs in preparing the plan? 1. Yes 2. No

29. If yes, how you nominate local NGOs?

30. Do you involve any corporate who contributed to CAMPA fund as a member of CAMPA committee? 1. Yes 2. No

31. Are you submitting the APO of the state CAMPA regularly to the central CAMPA? 1. Yes 2. No

32. What are the activities you have undertaken as a utilization of CAMPA fund in Odisha?

33. As a utilization of CAMPA fund what your department have done towards the conservation of forest resources?

34. Plantation details in Odisha:

Year	Area planted (in hectare)	Plants name	Community involvement 1. Yes 2. No	Survival rate (%)
2009-10				
2010-11				
2011-12				
2012-13				

35. Are you undertaking afforestation programme near the area where FRA has been enacted? 1. Yes 2. No

36. If yes, are you conducting plantation programme in consultation with the tribes? 1. Yes 2. No

37. Is FRA being violated due to CAMPA intervention? 1. Yes 2. No

38. Does some of the activities of CAMPA affected the life and livelihood of tribal people 1. Yes 2. No

39. If yes, Explain

40. Do you feel the inclusion of tribal department in the state level CAMPA committee will help in developing tribal livelihoods? 1. Yes 2. No

41. If no, why?

42. Is CAMPA helping in the conservation and protection of reserved forests?

1. Yes 2. No

43. If yes, what types of activities is being undertaken?

44. What are the infrastructural development programme CAMPA is undertaking?

45. In which area CAMPA has undertaken infrastructural development programme?

46. Have you created any new forest as a utilization of CAMPA Fund in Odisha?

1. Yes 2. No

47. If yes, mention the district and forest name

Questionnaire on Campa Fund-Field Level

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
DRAFT SCHEDULE FOR FOREST DEPT (FIELD LEVEL) REGARDING CAMPA FUND
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..

2. Sex……1. Male 2.Female

3. Department/Position……..……..

4. Since how many years you are in this position?
   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years

5. Since how many years you are dealing with CAMPA fund?

   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years

6. How much money MCL deposited towards CAMPA fund? Rs. .....

7. Are you doing any forest conservation activities in MCL operation areas? 1.Yes 2. No

8. If Yes, mention details

9. If no, why?

10. Plantation details in MCL Regions:

Year	Area planted (in hectare)	Plants name	Community involvement 1. Yes 2. No	Survival rate (%)
2009-10				
2010-11				
2011-12				
2012-13				

11. Do you feel the plants you planted will help in backing the forest based livelihoods of the local communities in MCL affected areas? 1. Yes 2.No

12. If yes, Mention

13. If no, mention the reason

14. Are the villagers getting MFP, where CAMPA is doing forest conservation? 1. Yes 2. No

15. What are the activities you are doing to check the detoxification in MCL areas?

16. Are you undertaking any water and soil conservation activities in MCL areas? 1. Yes 2. No

17. If yes, mention details

18. What are the activities you are doing to control air pollution in the MCL region?

19. Have you undertaken any infrastructural development programme near MCL area?
1. Yes 2. No

20. If yes, mention the type of infrastructures?

21. Are you supplying pure drinking water to the MCL affected people? 1. Yes 2. No

22. If yes, Can you mention the activities undertaken?

23. Are you doing any activities by using this fund to control noise and soil pollution near MCL area? 1. Yes 2. No

24. If yes, mention the activities.

25. Is CAMPA doing any activities to control disease near the MCL area ? 1. Yes 2. No

26. If yes, mention details.

27. Are you doing any activities to control flood in MCL affected areas? 1. Yes 2. No

28. Have you taken any measures to protect and conserve the wildlife and their habitats near MCL area? 1. Yes 2.No

29. If yes, mention the types of programme undertaken.

30. Is CAMPA set up any institutes, societies, centre of excellence relating to forest and wild life? 1. Yes 2. No

31. If yes please mention?

32. Are you undertaking any environmental restoration activities in the abandoned mines in mcl? 1. Yes 2. No

33. If yes, mention details.

34. Does CAMPA undertake any independent monitoring and evaluation works to know the effective and proper utilization of funds? 1. Yes 2. No

35. Is there any separate committee for monitoring and evaluation of activities? 1. Yes 2. No

36. Have you recruited any contractual staff under CAMPA fund? 1. Yes 2. No

37. Are you providing any training under CAMPA fund? 1. Yes 2. No

38. Did you form any voluntary youth/student organization for forest conservation? 1. Yes 2. No

39. If yes, what type of activities the organization is doing?

40. Are you organizing any activities under CAMPA fund for the promotion of tourism in the MCL area? 1. Yes 2. No

41. Are you monitoring the activities of MCL relating to environmental safety? 1. Yes 2. No

42. If yes how frequently you are doing do it?

1. Once in a year 2. Twice in a year 3. Thrice in a year
4. Once in two year 5. Once in three years 6. Other…….

43. Have you taken any action if you found that company is not following the guidelines on what basis your dept. has given environmental clearance? 1. Yes 2. No

44. If yes, mention the details.

45. Have you surveyed about the existence of types of plants and animals before mining operation in this locality? 1. Yes 2. No

46. Have you recently done any survey to know the status of plants and animals which are endanger? 1. Yes 2. No

47. If yes, what steps you have taken to protect those plants and animals in the project affected areas?

Questionnaire Abandoned Coal Mining

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
SCHEDULE FOR MINING COMPANY REGARDING ECOLOGICAL RESTORATION OF ABNDONE COAL MINING
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..

2. Sex……1. Male 2. Female

3. Department/Position……..……..

4. Do you have any abandoned coal fire areas? 1. Yes 2. No

5. What kind of loss it has brought in your project area?

6. Do you feel high temperature due to the coal fire has exceeded the tolerance limits of living creatures both animals and plants? 1. Yes 2. No

7. Is it destroyed rock and soil in these areas? 1. Yes 2. No

8. Does the smoke produced from it is creating any kind of suffocation for the villagers?
1. Yes 2. No

9. If yes, are you taking any steps for the ecological restoration of these places? 1. Yes 2. No

10. If yes, what kind of activities you have undertaken to mitigate these problems?

11. Do you cover the fire areas with soil? 1. Yes 2. No

12. Do you restore vegetation in those areas? 1. Yes 2. No

13. Are you bringing some soil animals and micro-organisms to those areas in order to improve the ecological system in fire areas? 1. Yes 2. No

14. Is there any policy guideline to reclaim the abandoned mining? 1. Yes 2. No

15. Are you following the Mining regulations i.e, the Mineral Concession Rules, 1960 and the Mineral Conservation and Development Rules, 1988 at the time of closing the mining?

1. Yes 2. No

16. Is there any agreement held with the Govt. regarding restoration of abandoned mining areas before starting the mining activities? 1. Yes 2. No

17. Is there any agreement within how many years the restoration activities should be over?
1. Yes 2. No

18. If yes, Mention the year…….

19. Are you changing the structure of the land at the time of restoration process?
1. Yes 2. No

20. Are you taking any steps for the regeneration of bio mass at the time of closing the Abandoned mining areas? 1. Yes 2. No

21. If yes, what activities you are taking up?

22. If no, why you people are not doing so?

23. Have you done any plantation activities in those abandoned mining areas? 1. Yes 2. No

24. Have you submitted the mining closer plan? 1. Yes 2. No

25. Are you doing the reclamation activities as per an approved Mine Closure Plan?
1. Yes 2. No

26. Have you undertaken some preparatory works for closure of the mine you are operating now?
1. Yes 2. No

27. If yes, what you are doing?

28. Are there any successful abandoned mine sites? 1. Yes 2. No

29. If yes, what type of activities is taking place there?

30. Do you feel the mines, which you have already closed is ready for rehabilitation?
1. Yes 2. No

31. If no, mention the reasons.

32. Have you done all the backfilling, reclamation, dump stabilization, afforestation activities?
1. Yes 2. No

33. If no, why?

34. Are doing the ecological restoration activities in collaboration with any other organizations?
1. Yes 2. No

35. If yes, mention details.

36. Are you involving local people in ecological restoration in abandonee mining areas?
1. Yes 2. No

37. Did you consult the Gram Sabha before taking any initiation in ecological restoration of the closing mine. 1. Yes 2. No

38. What kind of repairing methods you are adopting to repair the mining subsidence areas?

39. Do you have any mining which is going to be closed within a year? 1. Yes 2. No

40. If yes, have you submitted the final mining closer plan? 1. Yes 2. No

41. If no, mention the reason.

42. Before how many years/months you have to submit your mine closure plan?
1. Before 1 year 2. Before 6 months 3. Before 3-4 months
4. Others (specify), ……

43. Before how many days MCL announces the expansion of the projects?
1. Before 2 years 2. Before 1 year 3. Before 6 months
4. Before 3-4 months 5. Others (specify), ……

44. Do you feel the existing policies towards the mining regulation are enough in taking care of ecological restoration? 1. Yes 2.No

45. If no give your comments.

46. Mention your suggestions for further improvement in policy and implementation.

Questionnaire Hospital

NATIONAL INSTITUTE OF TECHNOLOGY

Rourkela, Odisha – 769008

Draft Questionnaire Schedule for Hospitals/Clinic

Coal Mining, Displacement and Rural Livelihoods

(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..

2. Sex……1. Male 2.Female

3. Department/Position……..……..

4. Name clinic/hospital……

5. Since when the health centre is functioning *(year)*……..

6. Since when is this health centre functioning from this building? *(year)*

7. Name of the head quarter village/block _____

8. Number of villages covered by the health centre _____

9. Population covered by the health centre *(latest)* _____

10. Infrastructure

10.1. Health Centre Building		
10.1.1	Ownership of **Health Centre** building	Own 1 Rented 2 Donated/Rent Free 3
10.1.2	Type of HEALTH CENTRE building	Pucca 1 Semi-Pucca 2 Kachcha 3
10.1.3	Maintenance	Regular 1 Occasional 2 Never done so far 3 New building ***(<2YEARS OLD)*** 4 Only on request (civil/ electrical) 5 When was it done last _____years ago 6
10.1.4	Present condition of the building (Respondent)	Good 1 Needs minor repair 2 Needs major repair 3
10.1.5	Toilet Facility	Yes 1 No 2

10.2. Staff Quarters

Category of Staff	Number of quarters Available		Whether at least one stay in the HEALTH CENTRE compound Yes – 1 No - 2
	Total	Occupied by same allotted Yes – 1 No - 2	
Medical Officer			
Health Assistant (Male)			
Health Assistant (Female)			
Nurse/ANM			
Others 'specify…….			

10.3. Water Supply

10.3.1	Main source	Tap Tube Well /Hand Pump/Bore Well Well Other_____	1 2 3 4
10.3.2	Ownership of the source	Hospital's own Public	1 2
10.3.3	Is water supply regular?	Yes No	1 2
10.3.4	If water supply is not regular, Whether overhead tank is available?	Yes No	1 2
10.3.5	Electricity connection	Yes No	1 2
10.3.6	Whenever you need, is generator available?	Yes No	1 2
10.3.7	Telephone Facility	Yes No	1 2

10.4 Ambulance Availability

10.4.1	Ambulance Available	Yes No	1 2
10.4.2	If available, since when? (YEAR)		
10.4.3	If not available, whether there is provision to hire vehicle?	Yes No	1 2
10.4.4	Is the vehicle functional on date of interview?	Yes No	1 2
10.4.5	Is health center driver available for regular duty?	Yes No	1 2
10.4.6	Is health center driver available for emergency duty?	Yes No	1 2
10.4.7	Supply of petrol/diesel	Sufficient Insufficient	1 2
10.4.8	Is allocation of money sufficient for repair?	Sufficient Not sufficient	1 2

10.5 Is there any Janani Express available in your hospital? 1. Yes 2. No

10.5.1 If yes, then what type of work it usually does?

10.5.2 Is there any mobile van available in order to address the health need of the villagers?

1. Yes 2. No

10.6. Facilities Available

Qr. No.	Facilities Available	Yes-1 No-2	Utilised Yes-1 No-2 NA-3
10.6.1	Is O.T. available?		
10.6.2	Is separate generator available for O.T. ?		
10.6.3	Is labour room available?		
106.4	Blood test – routine		
10.6.5	Blood test - VDRL		
10.6.6	Urine test		
10.6.7	Stool test		
10.6.8	TB test		
10.6.9	Bed for patient		
10.6.10	Vaccine Carrier		
10.6.11	Weighing Machine (Infant)		
10.6.12	Weighing Machine (Adult)		
10.6.13	B.P. Instrument		
10.6.14	Thermometer		
10.6.15	Refrigerator		
10.6.16	Govt. supply medicines		

11 Staff Position

Qr. No.	Category of Staff	Number of Posts		if vacant, since when the position is vacant (in months)
		Sanctioned	Regular	
11.1	Medical officer			
11.2	Medical Officer (Female)			
11.3	Pharmacist			
11.4	Compounder			
11.5	Lab. Technician			
11.6	Driver			
11.7	Class IV Staff			
11.8	nurse/staff nurse			
11.9	Health asst. – Male			
11.10	Others 'specify……..'			

12. Which of the following diseases are frequently reported and diagnosed at the hospital/clinic?

1. Malaria 2. Diarrhoea 3. Skin diseases 4. Fever
5. Colds and catarrh 6. Asthma 7. Injuries other disease (specify)……

13. Which of the diseases mentioned above tops the chart for the past three years?

1. Malaria 2. Diarrhoea 3. Skin diseases 4. Fever 5. Colds and catarrh
6. Asthma 7. Injuries Other disease(s) ……

14. Are some of the diseases directly or indirectly associated with mining activities?
1. Yes 2. No

15. If yes, which of the diseases are caused by or associated with mining activities in this area?
1. Malaria 2. Diarrhoea 3. Skin diseases 4. Fever 5. Colds and catarrh
6. Asthma 7. Injuries Other disease(s) ……

16. Do the diseases mentioned above constitute a significant cause in mortality rates in the communities? 1. Yes 2. No

17. Is your /hospital fully equipped to handle such cases frequently reported at the hospital?
1. Yes 2. No

18. If no, what are the constraints?

19. Is your hospital doing something to address the health problems associated with mining within this area? 1. Yes 2. No

20. If yes, mention those activities

21. Are you doing some programme to create health awareness? 1. Yes 2. No

22. Do your hospital open at night? 1. Yes 2. No

23. If no, then what is the time schedule of your hospital ……..

24. Can you mention the number of emergency patient visited your hospital in last one year?

.

25. Do you provide service to some emergence patients? 1. Yes 2. No

26. How many Anganbadi centers and Asa workers are associated to your hospital?....

27. Do you monitor their activities regularly? 1. Yes 2. No

28. Can you give some suggestions and comments for future growth?

29. Major Type of Disease prevalent in this Area

S. No	Total number of patient registered	Total number of patient registered*			Disease found related to pollution (data found from the primary health care centre register)									
		M	W	C	Eye Allergy	Skin disease	ARI	Malaria	Gastro-intestinal disease	Arthritis	Fever	TB	Asthma	Any other
1	Jan 2011													
2	Feb 2011													
3	March 2011													
4	April 2011													
5	May 2011													
6	June 2011													
7	July 2011													
8	August 2011													
9	Sept 2011													
10	Oct 2011													
11	Nov 2011													
12	Dec 2011													
13	Jan 2012													
14	Feb 2012													
15	Mar 2012													

* M-Male; F-Female; C-Child

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
QUESTIONNAIRE FOR GRAM PANCHAYAT IN MITIGATIONA AND ADAPTATION
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..

2. Sex……1. Male 2.Female

3. Department/Position……..……..

4. Since how many years you are in this position?
   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years

5. Are you aware about the activities of MCL in your GP? 1. Yes 2. No

6. Do the MCL consulted with your GP before starting the mining operation in your area?
   1. Yes 2. No

7. If yes, what kind of negotiation you made with them?

   a- b-

   c- d-

8. If no, had your GP taken any initiation in mobilizing public and fighting for people's right?
   1. Yes 2. No

9. If yes, mention details about activities you taken up.

   a- b-
   c- d-

10. Are you happy with the rehabilitation package given by MCL to projected affected people?
    1. Yes 2. No
11. If no, what role your GP played during that time.

    a- b-

c- d-

12. Are you aware about CAMPA fund? 1. Yes 2. No

13. If yes, have you ever monitored the utilization status of CAMPA fund in your locality?
1. Yes 2. No

14. Are you aware about the activities taken by forest department in your GP? 1. Yes 2. No

15. What steps who have taken to provide the lands to the forest dwellers as per FRA,2006

a- b-

c- d-

16. Have you organized Gram Sabhas to discuss these issues and its proper implementation?
1. Yes 2.No

17. Do you face any conflicting situation with forest department at the time of implementation of forest right Act? 1. Yes 2.No

18. If yes, please give details.

19. Kindly mention the status of FRA in your GP.

20. Is there any special programmes being introduced by Govt. for the development of Project affected people? 1. Yes 2. No

21. If yes, mention the programme details and their implementation status.

22. Does your GP taken some special initiation for the mitigation of environmental problems faced by project affected people in your GP? 1. Yes 2. No

23. If yes, mention details about the initiations.

24. If no mention the reasons.

25. Do you have introduced NREGS in your GP? 1. Yes 2. No

26. Do all the households have received job cards? 1. Yes 2. No

27. Do the households are getting 100 days employments? 1. Yes 2.No

28. Are you providing wages in time? 1. Yes 2. No

29. Is there any monitoring committee in your GP to see the progress of each and every work?
1. Yes 2. No

30. Have you provided Indira Avas to any project affected households? 1. Yes 2. No

31. Have you provided BPL card to all needy project affected households? 1. Yes 2. No

32. If no, mention the constrains

33. How many households in your GP covers under Antyodaya Anna Yojana …….

34. How many households in your GP are covered under Annapurna Scheme……..

35. Are you satisfied with the CSR activities of MCL in your GP? 1. Yes 2. No

36. If, no what steps you have taken to rectify it?

37. Do you have formed any monitoring body to examine the CSR activities of MCL regularly?
1. Yes 2. No

38. If yes, are they submitting report regularly? 1. Yes 2. No

39. Does your GP providing drinking water to project affected villagers? 1. Yes 2. No

40. Have you taken any initiation to provide better health facilities to the project affected villagers?
1. Yes 2. No

41. If yes, mention details

42. Are you organizing any health camp in that locality? 1. Yes 2. No

43. Do you have formed any micro plan to make the villagers to cope with the changing environment that occurs due to mining? 1. Yes 2. No

44. If yes, please mention.

45. Are you doing any plantation activities in your locality? 1. Yes 2. No

46. If yes, are you involving community members in doing this? 1. Yes 2. No

47. How many acres of land you have done plantation…….

48. What is the percentage of survival rate of those plants……..

49. Have you taken any initiation for the agricultural development of project affected villagers?
1. Yes 2. No

50. If yes, please mention the activities taken up.

51. What majors you have taken to provide basic infrastructural facilities in project affected areas?

52. Is there any abandoned mining in your GP? 1. Yes 2. No

53. If yes, have you taken any majors for it reclamation? 1.Yes 2. No

54. If yes, mention details

55. In most of the time it was found that mining is polluting water and air. What action you have taken to save the villagers from this kind of pollution?

56. Have you taken any issues to the higher authorities if it is not properly addressed by the MCL
1. Yes 2. No

57. If yes, please mention details about the issue and to whom you addressed.

58. Are you providing some economic support or training programmes to project affected households? 1. Yes 2. No

59. If yes, please mention in details.

60. Have you formed any SHGs in your locality? 1. Yes 2. No

61. Are you organizing any special programme for the preservation of local culture?
1. Yes 2. No

62. If yes, kindly mention details.

63. If your GP is doing something else for the adaptation and mitigation of socio-economic issues lying in mining affected areas mention.

Checklist for FGD with Gram Sabha

NATIONAL INSTITUTE OF TECHNOLOGY
Rourkela, Odisha – 769008
CHECKLIST FOR FGD WITH GRAM SABHA
Coal Mining, Displacement and Rural Livelihoods
(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the village……..
2. Do you have Gram Sabha in your village? 1. Yes 2. No
3. If yes, which year it was formed.
4. What is the name of Gram Sabha chief……
5. Do you call the Gram Sabha meeting regularly? 1. Yes 2. No
6. If yes, how frequently you meet? 1. Once in a month 2. 4times in a year
   3. Twice in a year 4. Once in a year 5. Any other…….
7. Since how many years mining operations continuing in your village?.....
8. Are you aware about the activities of MCL in your village? 1. Yes 2. No
9. Do the MCL consulted with your Gram Sabha before starting the mining operation in your area?
   1. Yes 2. No
10. If yes, what kind of negotiation you made with them?
    a- b-
    c- d-
11. If no, had your Gram Sabha taken any initiation in mobilizing public and fighting for people's right? 1. Yes 2. No
12. If yes, mention details about activities you taken up.
    a- b-
    c- d-
13. How many households lost their houses because of mining operation?.....
14. How many households lost their agricultural land because of mining operation?.....
15. Is there common property you lost because of mining operation in your area? 1. Yes 2. No
16. If yes, mention those

17. Are you happy with the rehabilitation package given by MCL to projected affected people?

1. Yes 2. No

18. If no, what role your Gram Sabha played during that time.

a- b-

c- d-

19. Are you aware about CAMPA fund? 1. Yes 2. No

20. If yes, have you ever monitored the utilization status of CAMPA fund in your village?

1. Yes 2. No

21. Are you aware about the activities taken by forest department in your locality?

1. Yes 2. No

22. What steps who have taken to provide the lands to the forest dwellers as per FRA, 2006

a- b-

c- d-

23. Have you organized Gram Sabhas to discuss these issues and its proper implementation?

1. Yes 2. No

24. Do you face any conflicting situation with forest department at the time of implementation of forest right Act? 1. Yes 2. No

25. If yes, please give details.

26. Kindly mention the status of FRA in your village.

27. Is there any special programmes being introduced by Govt. or your GP for the development of Project affected people in your village? 1. Yes 2. No

28. If yes, mention the programme details and their implementation status.

29. Does your Gram Sabha taken some special initiation for the mitigation of environmental problems faced by project affected people in your village? 1. Yes 2. No

30. If yes, mention details about the initiations.

31. If no mention the reasons.

32. Do you have introduced NREGS in your village? 1. Yes 2. No

33. Do all the households have received job cards? 1. Yes 2. No

34. Do the households are getting 100 days employments? 1. Yes 2.No

35. Does your GP providing wages in time? 1. Yes 2. No

36. Does your Gram Sabha decide the activities to be undertaken in NREGS in your village?

1. Yes 2. No

37. If no, who decides these activities? 1. GP 2. BDO 3. Collector
4. No idea 5. Any other…….

38. Is there any monitoring committee in your village to see the progress of each and every work?
1. Yes 2. No

39. Have you lobbied for Indira Avas to any project affected households? 1. Yes 2. No

40. Have you lobbied for BPL card to all needy projects affected households? 1. Yes 2. No

41. If no, mention the constrains

42. How many households in your village covers under Antyodaya Anna Yojana ……

43. How many households in your village are covered under Annapurna Scheme……..

44. Are you satisfied with the CSR activities of MCL in your village? 1. Yes 2. No

45. If, no what steps you have taken to rectify it?

46. Do you have formed any monitoring body to examine the CSR activities of MCL regularly?
1. Yes 2. No

47. If yes, are they submitting report regularly? 1. Yes 2. No

48. Do you have taken any initiation in providing drinking water to project affected villagers?
1. Yes 2. No

49. Have you taken any initiation to provide better health facilities to the project affected villagers?
1. Yes 2. No

49. If yes, mention details

50. Are you organizing any health camp in your locality? 1. Yes 2. No

51. Do you have formed any micro plan to make the villagers to cope with the changing environment that occurs due to mining? 1. Yes 2. No

52. If yes, please mention.

53. Are you doing any plantation activities in your locality? 1. Yes 2. No

54. If yes, are you involving community members in doing this? 1. Yes 2. No

55. How many acres of land you have done plantation…….

56. What is the percentage of survival rate of those plants……..

57. Have you taken any initiation for the agricultural development of project affected villagers?
1. Yes 2. No

58. If yes, please mention the activities taken up.

59. What majors you have taken to provide basic infrastructural facilities in project affected areas?

60. Is there any abandoned mining near to your village? 1. Yes 2. No

61. If yes, have you taken any majors for it reclamation? 1. Yes 2. No

62. If yes, mention details

63. Is MCL doing any activities for the reclamation and restoration of ecology in that abandoned mining areas? 1. Yes 2. No

64. If yes, do you feel those area will give you proper rehabilitation? 1. Yes 2. No

65. If no, mention your comments.

66. In most of the time it was found that mining is polluting water and air. What action you have taken to save the villagers from this kind of pollution?

67. Have you taken any issues to the higher authorities if it is not properly addressed by the MCL 1. Yes 2. No

68. If yes, please mention details about the issue and to whom you addressed.

69. Are you providing some economic support or training programmes to project affected households? 1. Yes 2. No

70. If yes, please mention in details.

72. Have you formed any SHGs in your locality? 1. Yes 2. No

73. Are you organizing any special programme for the preservation of local culture? 1. Yes 2. No

74. If yes, kindly mention details.

75. If your Gram sabha is doing something else for the adaptation and mitigation of socio-economic issues lying in mining affected areas mention.

Questionnaire for Tribal Department

NATIONAL INSTITUTE OF TECHNOLOGY

Rourkela, Odisha – 769008

QUESTIONNAIRE FOR TRIBAL DEPARTMENT

Coal Mining, Displacement and Rural Livelihoods

(Research Study sponsored by Planning Commission, Govt. of India, New Delhi)

1. Name of the Respondent……..
2. Sex…… 1. Male 2.Female
3. Department/Position……..……..
4. Since how many years you are in this position?

   1. 1 year 2. 2 year 3. 3 years 4. More than 3 years

5. Lots of mining activities are coming up in tribal region of Odisha, which has brought lots of threat to their livelihoods and culture. As a department for the development of tribal people what steps you have taken to save their livelihoods and culture?

6. Does the forest department consult your department while giving environment clearance to mining companies? 1. Yes 2. No
7. Do your department is a member of any such committee that gives mining lease to companies.

   1. Yes 2. No

8. If yes, please mention the name of those committees.
9. If no, mention the constrains.
10. What steps you have taken in implementing FRA, 2006 in mining affected areas?

11. Do you have faced any conflict with forest department while implementing this act?

    1. Yes 2. No

12. If yes, please mention.
13. There is no place for tribal department in CAMPA committee, what is your reaction towards this?

14. Sometimes it was observed that forest department is spending CAMPA fund in the same land where FRA is already implemented. Do you have faced any confrontation relating to this?

1. Yes 2. No

15. If yes, please explain.

16. What majors you have taken to protect the tribal rights in the case of displacement due to mining?

17. Do you have formed any committee to monitor and solve the displacement and rehabilitation issues raised in MCL areas? 1. Yes 2. No

18. What actions you have taken to protect PESA Act in mining affected areas.

19. Does your department ensure that mining activities is being granted by Gram Sabha?

1. Yes 2. No

20. Have you implemented any special development projects to sustain livelihoods of tribal people in mining affected villages? 1. Yes 2. No

21. If yes, mention details.

22. Have you taken any majors to protect tribal rights over common property resources in mining affected areas? 1. Yes 2. No

23. If yes, what steps you have taken.

24. What steps you have taken to preserve and conserve tribal culture and tradition?

25. Have you taken any step to enhance tribal agricultural production in mining affected areas?

1. Yes 2. No

26. If yes, mention details.

27. What steps you have taken to control air pollution in mining affected villages?

28. Do you have formed any committee to monitor the CSR activities of MCL in mining affected areas? 1. Yes 2. No

29. Have you taken any initiation to provide alternative livelihoods to tribal people in mining affected areas? 1. Yes 2. No

30. If yes, mention details.

31. Have you given any special training to tribal households to get job in mining companies?

1. Yes 2. No

32. If yes, please mention details.

33. Have you taken any steps to provide safe drinking water to tribal households in mining affected areas? 1. Yes 2. No

34. If yes, what you have done.

35. Are you undertaking some activities in managing waste materials in mining affected areas? 1. Yes 2. No

36. If yes, please mention details.

37. Do you have formed any committee to monitor the activities of mining companies in reclamation and ecological restoration of abandoned mining? 1. Yes 2. No

38. Do you feel the existing mining regulation policy is properly implemented by the mining companies? 1. Yes 2. No

39. Kindly give your comments and suggestions for policy modification in the case of mining regulation.