IMPACTS OF MINING ON ENVIRONMENT POLLUTION WITH REFERENCE TO WOMEN'S HEALTH

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ABSTRACT:

Mining operations generates substantial quantities of airborne respirable dust, which leads to the development of lung disease in mine workers. Mine worker's pneumoconiosis and silicosis are lung diseases that have adversely impacted the health of thousands of mine workers. The increasing trend of opencast mining leads to release of huge amount of dust. These air borne dust particles, generally below 100 micron in size, are environmentally nuisance and cause health hazards as an ill effect of mining activities. Opencast extraction activities like drilling, blasting, material handling and transport are a potential source of air pollution. Therefore, a detailed study on emission sources and quantification of pollutant concentration by means of dispersion modeling is required to access the environmental impact of an opencast mine. Mining based industries play an important role in improving country's economic growth and in generating employment. On the other hand mining activities and its auxiliary industries have the potential to cause environmental degradation. Women and children are constantly exposed to high risks of death and terminal illnesses due to constant exposure to dust and pollution. Studies have proved that their exposure to various hazardous pollutants has been far above permissible levels.

KEYWORDS*: economic growth, environment, mining operations, mine workers, pollution, women and children.*

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INTRODUCTION:

Mining from a gender perspective in India has to address a crucial area women's health. The health hazards and degeneration of the health conditions of women and children is one of the most serious impacts of 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 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. In India, this poses a much more dangerous situation as impacts of mining have been diverse depending on the nature of the minerals extracted and the extent of exploitation.

Despite people suffering from several forms of ill health, physical and mental deformities, and constant exposure to toxic wastes and chronic diseases as a result of mining, there is a tragic gap in the availability of 'scientific' studies and data on the health hazards of mining in India and more so on the women in mining affected communities. This has provided an ideal opportunity for mining industries to walk away from any responsibility towards the health of communities and workers they affect.

The apathy, lack of understanding and political will and gross corruption of the government enhances the scope of the industry to continue with impunity. As health issues are considered 'technical' and 'scientific', the complaints and evidence from communities and workers of the relationship between mining operations and their ill health are brushed under the carpet by the law implementing, monitoring and judicial authorities, on the pretext of improper and inadequate scientific corroboration.

Pitted against these forces are the women in the mining regions, whose health issues in general also, are marginally addressed in the country. Our development policies, especially in the context of economic activities like mining do not take into account, women's health as important indices for human growth and development. Hence mining is one of the largest 'sustainable' industries. How true is this in the context of Indian women rural, tribal and urban poor who cannot articulate the victimization of their bodies for the extraction of minerals?

HEALTH IMPACTS OF MINING ON WOMEN IN COMMUNITIES:

1. Living in the midst of dust and sewages:

Majority of the health problems in mining regions are caused due to unchecked pollution and high levels of toxicity, mine tailings and mine disasters. The health and safety problems vary from one mineral to the other, from the technology used, type of mining- open cast to underground - and the size of operations. The lands, water bodies, air and environment are polluted due to constant release of chemical wastes, dust generated by blasting and excavation, and the dumping of mine wastes and over-burden in the surrounding lands and rivers.

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 become victims of skin diseases, experience malfunctioning of various sensory organs, which has a long-term impact on their reproductive health. Noise and dust pollution affects women the most during pregnancy. For economic reasons, they 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 fetuses. For example, the most common diseases suffered by people due to the dust from the coal mines are tuberculosis, cough and cold, malaria, skin diseases, diarrhoea, staining of teeth, joints pain, arthritis, lethargy, etc.

Another example is mica where dust is the major cause of respiratory problems among mica miners. Diseases such as arthritis, is normally present after the age of 50, but in the mica mining areas in Andhra Pradesh, even 20 year olds complain of arthritis. There is a definite correlation between mica dust and the disorders. The range of health hazards of women in mining varies from simple coughs to thalasemia, silicosis and other fatal ailments.

Further, the effects of chemicals and radiation from the ores have direct impacts on the women's health. For example, one of the most serious impacts has been the suffering of women living in the proximity of uranium mines in Jaduguda (Jharkhand) where radiation levels are scientifically proved to be above permissible limits and where there is a direct correlation between the reproductive and health problems of women to that of radiation from uranium. Here, despite the depressing situation of miscarriages, giving births to physically and mentally deformed children, deaths and terminal illnesses like leukemia and thalasemia, and despite international lobbying and publicity on this issue our government chooses to disrespect and continue the abuse of

women's health. On the contrary, Adivasi women are expected to take national pride in sacrificing their health for the larger 'national security' concerns of India.

In a research undertaken in East Parej called Environmental and Health Impact Assessment due to coal mining in East Parej and North Karanpura coal field of Jharkhand state, by Dr. Nitish Priyadarshi, it was found that metals like fluoride, manganese, nickel, and sulphate are high in concentration in drinking water. They are nearer to the toxic levels while Manganese has crossed the toxic level in North Karanpura coalfield. The study assessed that metals like arsenic, mercury, fluoride, nickel and chromium may cause problems to the human beings even if they are present in trace amount in the drinking water. In an article published by Down To Earth, it was found that Damodar River and its tributary have been polluted by Arsenic and Mercury, two of the lethal minerals. In Lapan Tandi village of East Parej there are high amounts of Sulphate above the toxic level and wells contain nickel nearer to toxic levels. Iron concentrations were found to be very high in surface water of North Karanpura.

As a result of these toxic wastes in the water and soils, it was found that the longevity of the communities living in the coal mines has reduced drastically. The average longevity of women was found to be 45 and in most of the villages only one or two women had crossed the age of 60! The number of deaths in a period of five years also reveals shocking figures in Dudhmatia village: 6 out of average 80 people, in Agariatola village: 12 out of average 100 people, in Lapangtandi: 13 out of average 115 people, and in Ulhara: 9 (seven were children) out of average 80 people. Majority of the children are reported to be lethargic as a result of inhalation of toxic dust and consumption of contaminated water.

2. Water The Scourge:

Communities surrounding mine-sites are forced to consume the contaminated drinking water from sources like rivers, streams, wells and bore pumps due to ill-treated or non-treated chemical wastes and debris by the mining companies which seep into the ground water and soil. Women in particular are more susceptible to water pollution due to the role they play in the family, which involves contact with water sources for performing the household chores like collecting water, washing clothes, utensils and bathing children.

For example the Chromites mines in Orissa have caused severe health problems due to the contamination of rivers. A study commissioned by the Regional Research Laboratory (RRL), Bhubaneshwar revealed that mine seepage water released into the Domsala river in the Sukhinda

valley has severely affected the lives of communities as the Domsala river is the main source for many people in the area. The Hexavalent chromium present in this water causes marked irritation of the respiratory tract, nasal septum ulcers, and also causes irritant dermatitis rhinitis, bronchospasm and pneumonia. Children with sores all over the body are a common sight. The study further revealed that chromium has entered the food chain and has been found inedible plants especially mango and paddy, and in meat and fish.

In Andhra Pradesh water contamination in the areas surrounding the mica mines have given rise to several health hazards such as nausea, vomiting, diarrhoea and eosinophillia, silicosis and tuberculosis.

The depletion of ground water due to over consumption for mining purposes bringing serious changes in the water table affects the irrigation and drinking water facilities of the communities. In many places, companies set up treatment plants which do not function and the situation deteriorates to such an extent that the ground water cannot be used for human consumption any longer and sometimes villages 'voluntarily' relocate or migrate as has happened in Chhattisgarh. Villagers have no alternative but to drink the water of the wells provided by the miners which people often complain of foulness in taste, colour and with filth in the contents. Areas of large-scale mining are facing acute scarcity of water mainly in summer and in winter season. Dug wells generally get dried up in these two seasons. Natural drainage system is obstructed and diverted due to dumping of overburden and expansion of opencast mines

At times companies supply drinking water by trucks to the local communities as they draw up all the ground water. This dependence on the companies leads to a situation where the communities have to constantly fight with the management for regular and adequate supply of water creating a situation of conflict. Women and children spend a large part of their time and energies waiting in queues for water and which also results in reduction in water consumption by the women due to rationing of water supplies.

The women are thus forced to lead unhygienic lives by not bathing daily, not washing clothes regularly and not drinking water adequately. This is one of the most common situations in any of the coalmines in India as reported in a study conducted in East Para coal wateriness where the study revealed that due to water contamination the villagers avoid taking bath everyday, and that there is a gap of 5 to 10 days. Clothes are kept unclean and washed infrequently. Children are the most affected due to living in such unhygienic conditions and filth.

The water scourge also leads to social ill-health as tensions build up among the women every day while collecting the meager and uncertain supply of water in the slums and shanty towns of the mine-sites.

3. Blasting and Mine Accidents:

Communities living around the mine sites are constantly vulnerable to mining accidents. Mining companies use explosives for blasting which result in houses cracking and collapsing on women and children or when companies do not warn them of explosions while they are working in the fields or walking in their villages, thereby either killing or deforming them. Similarly, companies leave behind large mine pits around the houses and agricultural fields, which gradually get filled with contaminated water and debris and result in children and women (and even most often, livestock) accidentally falling into them and drowning or getting fatally injured. Companies rarely have taken responsibility for such accidents nor paid up for the losses or treatment. Especially when women get injured or disabled it is becomes most difficult to eke out a living or look after the children when the men are away in the mine-pits.

4. Health Conditions of Women Mine Workers: Women are employed in secondary activities such as cutting, sorting, quarrying and loading and unloading. Constant contact with dust and pollution and indirectly through contamination of water, air, etc cause severe health hazards to the women mineworkers. As majority of the women workers are contract laborers', and paid on a daily wage basis there is no economic security or compensation paid due to loss of workdays on account of health problems. Meager or no compensation is given during pregnancy period that puts a strain on incomes and health. Even during pregnancy women have to work in hazardous conditions amidst noise, air pollution that have adverse affects on their off springs.

The work conditions, work timings, leave facilities, etc have significant impact on women's health. Children are also unsafe and indirectly affected right from conception and birth as women are forced to take their children to the mining areas and expose them to high levels of dust, pollution, mine explosives and accidents.

The women suffer from several occupational illnesses such as respiratory problems, silicosis, tuberculosis, leukemia, asbestosis, arthritis, etc. Infant mortality rates have increased and the reproductive health of women has reduced which has given rise to related social problems. Lack of proper illumination, safety nets and equipment causes severe strain to women workers' health.

For example, in the Chromites mines of Orissa, the women complained of several health problems. The regular women workers, who are very few in number, were paid a meager Rs.10 per month for health benefits. Compensation for pregnant women was somewhere between Rs.2000- Rs.3000 if she is directly employed by the company, while the contractors pay a paltry Rs.500 at their discretion. The mines are damp and any ingestion of chromium causes gastrointestinal bleeding. Tuberculosis and asthma are common ailments. Hexavalent chromium is known to adversely affect women's health as it is teratogenic, causing birth defects in fetuses, embryo toxic, causes still birth, reduces fertility and is further excreted through breast milk.

Loss of eyesight is common, as women are not given any protective gear in any of the mine-sites whether stone crushing, chromites, quarrying or while loading and transporting mineral ores like coal manually. In some places they are given iron and mineral supplements injected into them in order to increase their work output and to build up resistance for the hard labour. Apart from terminal illnesses, a more concurrent and chronic problem of women working in mines is the development of muscular and back pains, wearing out of joints, arthritis and spondilosis, numbness, fatigue and lack of stamina, breathlessness, constant coughs, irritation in the eyes and a general physical incapacity.

In many unorganized mines the mine owners take very young people and there is a high rate of turnover and retrenchment so that any terminal or chronic health problems that the workers may suffer cannot be traced to the companies by government or researchers. Interestingly, in a study undertaken by National Institute of Occupational Health, on the Asbestos mines in Cuddapah district of Andhra Pradesh, majority of the mine workers were women and young girls who were retrenched within a few years and were reported to have migrated to Dubai and other places when the mine owners were questioned.

It is also difficult to medically prove the association of certain mine induced illnesses and diseases as in the unorganized sector laborers' keep shifting between different forms of livelihood like agriculture, construction work, etc and rarely are available for longitudinal studies. Companies try to hide the true conditions of workers' health and attribute their illnesses to addictions like alcoholism and smoking. Hence, silicosis, asbestosis and other respiratory illnesses are medically diagnosed as tuberculosis or other such illnesses incurred by workers

from alcohol, by the mining companies and government hospitals so as to deflect any direct correlation to the mine specific pollution and toxicity.

5. Sexual Exploitation:

In some mining communities discrimination is made towards employing mostly unmarried women and girls, the rational being, they are healthier, stronger and do not have much of family burden. They are also easy prey to the contractors, mining officials and other mineworkers who do not bring their families along and sexually exploit the local women. The women for fear of further harassment and loss of employment rarely report sexual exploitation. Serious health problems such as AIDS and other communicable diseases which are uncommon among the tribal communities are becoming rampant in mining towns both among women mine laborers and among women in the communities to whom these diseases are transmitted from the men.

Women living in the mining regions are highly susceptible to sexual assaults when going to the forest or while walking to their fields or just while living in their homes. Such atrocities on women mostly by migrant mine workers, contractors, mine owners and even higher-level management staff are common in mining towns. Many of the grass-roots groups and communities in the mining regions have identified this as a cause for serious concern.

For instance, in a remote tribal area of Vizag district in A.P where Indian Rayons and Industries was laying a road for a calcite mining project, women complained of sexual assaults and gang rapes by the company and the Border Roads Organisation which was constructing the road. Inspite of several representations to the local authorities, there was total apathy towards the situation.

In some cases, when social action groups expose the misdeeds, the local authorities hastily pay a meager compensation and hush up the issue. The mining regions have a widespread problem of unwed mothers, deserted women, concubines of the contractors, etc who find it difficult to eke out a living for themselves and their children leading to death of infants due to malnourishment.

A universal phenomenon in all mining regions is the flourishing of the flesh trade as women are forced into prostitution as the only means of 'assured' livelihood.

Deterioration in health status due to loss of livelihoods and access to natural resources: A comparative study of pre-mining and post mining communities especially in Adivasi regions shows a clear shift in livelihoods and way of life particularly for women in the affected communities. Displacement from land and loss of access to forests has a direct impact on the

health and nutrition of women and children. In traditional land and forest-based form of livelihood, the communities had access to a wide variety of agricultural and forest produce as Adivasi communities have basically consumption oriented economy.

The diversity of crops grown by Adivasis are a means of ensuring balanced nutrition which is supplemented by the variety of forest species like tubers, roots, leaves, fruits and nuts collected by the women and children. Since access to food is not dependent on cash flow as against the need to purchase even basic food items in a non- agriculture and forest based economy like mining, women have better access to food security in traditional systems.

In mining situations, women are completely thrown out of their economic roles and as they are forced to depend mainly on the wages of the men, they have lesser cash flow and lesser participation in decision-making on food and household expenditures. On the face of it, mining towns look affluent as even the poor purchase assets like radios, television sets, furniture, clothes and other commodities. A greater part of the incomes are also spent away by the men on vices like alcohol, gambling and sexual exploits. Studies have proved that there is lesser expenditure on basic food items as money is frittered away by the men on wasteful commodities. The obvious victims are women in the families who sacrifice their food and medical needs for making both ends meet from within the wages spared by the men.

The forest cover degenerates gradually in all mining regions due to pressure from mining operations and from new populations settling down in the fringes. Among forest dwelling communities, women's main source of cash is the forest wealth, which they collect and sell in the village markets. After selling the produce, the women purchase food and other household items from the market and are in a position to save in seasons when the forest produce is collected in abundance. It is from this income that they meet their medical expenses, purchase clothes for themselves and their children and invest in agricultural needs.

Thus, the loss of traditional rights over land and forests has contributed to the deterioration of women's health status. The only access to health care for women- the forest rich in medicinal plants becomes inaccessible leaving them without this important natural source. Further the mining activities have introduced a number of previously unheard of diseases among the tribes, which makes their traditional health remedies ineffective.

Since medical services and medicines have to be purchased (if available), women neglect their illnesses, as they never have the cash. The mining companies provide hospitals but these are

mainly for the employees and management staff of the project. These facilities are most often, not for those communities living around the project and not even for the contract labour employed in the mines. In certain cases, there is no access even to a Primary Health Care Centre.

6. Environmental Hazards in Mining Projects:

Mining from time immemorial has remained a major environmental concern. The mining of mineral resources, whether by opencast or underground methods, has adverse environment impacts. The magnitude and significance of these impacts, however, varies in case of different minerals depending upon the method of mining and beneficiation, scale and concentration of mining activity in conjunction with the geological and geomorphologic setting of the area. The general environmental problems associated with most mining projects is depletion and degradation of existing surface water and aquifers, tailings leakage, leaching from dumps, land degradation and large scale deforestation.

Despite laws and regulations constituted for the environmental protection of the mining areas, there are serious health hazards caused due to waste material generated (mine tailings) and dumped on the surrounding land and river systems. Huge pits of mine waste called tailing ponds carrying over burden are an open danger to the communities living around the mine sites. Rarely are the workers or communities knowledgeable of the type of chemicals used for extraction and processing and the toxic implications on the environment and on their health as a result of this exposure. Hazardous minerals like asbestos whose extraction and processing have been banned in other countries are still being operated in India sometimes in the guise of other minerals.

7. Laws to safeguard the miner's health where are the protections for women?

The Mines Act, 1952 has laid out guidelines for safety of workers employed in mines and regulates the working conditions and amenities for them. To ensure the implementation of the Mines Act, 1952, the Union Legislature has framed the Mines rules, 1955, Metalliferous Mines Regulations, 1961 and the Maternity Benefit (Mines) Rules, 1963. The Mines Act, 1952 prescribes the duty of the owner to manage mines and mining operation and the health and safety in mines. It also prescribes the number of working hours in mines, the minimum wage rates, and other related issues. The Mines Act was amended in 1983 to cover all personnel solely engaged on work relating to mines within the scope of the Mines Act. This indicates that safety of workers engaged in over ground activities and related activities were not considered by the state till 1983.

The 1993 National Mineral Policy addresses the issue of adverse effects of mining on the environment and recycling of metallic scrap and mineral waste. The Ministry of Environment and Forests (MoFF) has identified mining and ore beneficiation along with asbestos and asbestos based industries as heavily polluting industries. Legal provisions related to the abandonment and restoration of mines has also been laid down by the Constitution. The Mineral Conservation and Development Rules (1988) in Article 23 has laid down conditions for the abandonment of any mine and has specified the need for providing a plan for dealing with the environment. The section on environment clearly states that the mining company should take all possible precautions for the protection and control of pollution during the mining and post mining operations.

The law states that the holder of a prospecting license or a mining lease shall take steps so that the overburden, waste rock, rejects and fines generated during prospecting and mining operations or tailings, slimes and fines produced during sizing, sorting and beneficiation or metallurgical operations shall be stored in separate dumps. Further, the dumps have to be properly secured to prevent escape of material in harmful quantities, which may cause degradation of environment, and to prevent causation of floods. The site for dumps, tailings or slimes has to be selected as far as possible on impervious ground to ensure minimum leaching effects due to precipitation.

The law further lays guidelines to restore or protect the flora of the area under the mining lease and nearby areas, technically, economically and environmentally. The law states that every holder of prospecting license or mining lease shall undertake the phased restoration, reclamation and rehabilitation of lands affected by prospecting or mining operations and shall complete this work before the conclusion of such operations and the abandonment or prospect of abandonment of the mine.

The Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the Environment (Protection) Act, 1986 (29 of 1986) states that air pollution due to fines, dust, smoke or gaseous emissions during prospecting, mining, beneficiation or metallurgical operations and related activities shall be controlled and kept within " Permissible Limits". This permissible limit is highly debatable and controversial issue.

Despite these laws protecting the environment and safety of the mine workers, their situation has not little changed or improved nor has there been any benefits provided to them either during their work on during accidents or disasters.

8. CONCLUSIONS:

· While none of the existing legislations have ever provided justice to communities suffering from health problems due to mining, there are no laws which specifically protect the rights of women's health in mining, either as communities or as workers.

· Occupational health issues of women mine workers needs to be addressed urgently. No proper medical records are maintained, no health check-ups are conducted either by the companies or governments. Moreover, occupational illnesses are suppressed and workers are promptly retrenched when health problems are detected.

Women are forced to work in mine-sites where certain minerals have been banned as they have been proved to be too hazardous for human exposure. Women are found in asbestos mines in the name of soapstone. The Mineral policy should review the extraction and processing of certain toxic and hazardous minerals like Asbestos, Uranium and consider the social, health and environmental impacts of these minerals vis-à-vis their economic or foreign exchange values. If women are working mainly in the small scale mines, government has to look into the laws, technology and management accountability towards women miners' health. The question here is, does technology have the answers?

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A non agriculture based system alienates women from the food security, rights over natural resources and leads to deterioration of their health status how do governments, policy makers and civil society groups define and implement development and human growth vis-à-vis economic programmes from a gender perspective, especially in the area of health. While health issues like AIDS are causing great concern as the most widespread future threat and large allocations from governments and external grants/loans are concentrated in AIDS eradication, there is a corresponding increase in opening up more areas for mining which has a direct relationship to the growth of AIDS. There is no adequate information or medical check up for identifying and controlling the spread of AIDS in mining regions when the global mining industry itself has admitted that 30-40 percent of all mining towns in the world have AIDS. Women and children are constantly exposed to high risks of death and terminal illnesses due to constant exposure to dust and pollution. Studies have proved that their exposure to various hazardous pollutants has been far above permissible levels. Yet no companies have ever been held legally responsible for such mass abuse of these vulnerable groups. Government should set

up monitoring mechanisms in order to ensure better health and safety of women and children in mining regions and therefore, how viable are most of the mining industries from a health perspective.Companies accountable to workers, communities and to civil society under corporate social responsibility.

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