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ABSTRACT

Mining not only has a negative impact on livelihoods, communities, and the socio-economic and physical environment; it specifically and profoundly affects women. This paper uses the gender analysis framework as a tool to make a comparative analysis of the impact of mining on the lives of women and men, and girls and boys. The objective is to examine the roles, responsibilities, and decision-making powers across genders in mining areas. It also attempts to find out their needs and priorities, benefits and incentives, and resources and constraints. An analysis of the situations from Burkina Faso to India and West Virginia to Indonesia shows the types of gender differences and inequalities existing in the mining sector. The paper concludes that mining can be an effective vehicle of economic development if gender concerns are built into every aspect of project development.

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1. Introduction

Despite women's active participation over the years, the mining sector is known to be male-dominated. Therefore, engendering mines and gender mainstreaming in the mines is the proper direction to be followed. This will yield benefits for ordinary people in the communities in which the mines are sited. An awareness of gender issues has come to the mining sector through four different routes:

- (i) The rising demands of gender equity in all walks of life.
- (ii) Consciousness among the people with regard to the past roles of women in the mines, and their present contributions.
- (iii) Increased awareness of the economic potential of artisanal and small scale mining, both of which involve a large number of women in developing countries.
- (iv) The highly controversial issue of whether mining is really beneficial in the country of their operations.

A significant body of research has been developed in the areas of gender and mining. Case studies around the world have reflected the visible role of women in large-scale mining. Another body of research has focused on the role of both women and men in Artisanal and Small-scale Mining (ASM) (Lahiri-Dutt 2000). Gender mainstreaming in mining is justified for four reasons (Lahiri-Dutt 2006):

- (i) Women are often the weakest and poorest in the local community.
- (ii) Women are often the most affected by the adverse impacts of mining.
- (iii) Women in poor communities are often responsible for household survival.
- (iv) The basic right to be heard, enabled and empowered applies equally to women.

Burke (2006) has divided women involved in mining in three different ways. They are: (a) miners - involved in the actual mineral extraction process, either as underground workers in the large mines or in the small-scale artisanal mines; (b) workers at surface - involved in crushing, sorting or preparation of coal or ore, and the official staff including

clerks, secretaries, etc; (c) women as members of the mining community. In this paper we consider only the first two groups, including mining women in large-scale mining as well as ASM. Case studies from around the world have been reviewed.

The main objectives of this paper are:

- (i) To examine the roles, responsibilities, and decision-making powers across genders in mining areas
- (ii) To find out their needs and priorities, benefits and incentives, and resources and constraints.

This paper has used the gender analysis framework as a tool to make a comparative analysis of the realities of the impact of mining on the lives of women and men, and girls and boys. The analysis has not focused on any particular framework; rather, it has taken the main points of the entire framework. This paper has been organized into four sections: Section one is an introduction to this study. Section two presents the gender analysis. Section three discusses the pan world review, and Section four concludes the study.

2. Gender Analysis

Gender analysis is a type of socio-economic analysis (USAID). It is a tool to better understand the realities of the women and men, and girls and boys, whose lives are impacted by planned development (Pasteur 2002). It identifies the types of gender differences and inequalities that might otherwise be taken for granted; for example, how men and women have different access to and control over resources, carry out different social roles, face different constraints, and receive different benefits. Once highlighted, they can be addressed and alleviated by carefully designed programmes (USAID). It explores the nature of gender differences. During a gender analysis, we systematically ask questions about the differences between men and women in a given population, with respect to their roles and activities, resources and constraints, and benefits and incentives.

To understand gender analysis, it is important to understand the conceptual difference between two terms, "sex" and "gender". Sex refers to the biologically determined differences between men and women, and is universal. Gender, on the other hand, refers to the social differences between men and women, which are learned, changeable over time, and vary widely within and across cultures (ILO 1998).

Over the years, many gender impact assessment frameworks have emerged. Each of them has its own strengths and weaknesses. Their suitable application depends on the

context in which they are being used. However, all of them have the potential to be useful when considering the gender impacts of a mining project. Each framework consists of a series of tools designed to facilitate the capture and analysis of specific information and is often displayed in a table of matrix form (Hill and Newell 2009). The most commonly used gender analysis frameworks are:

- (a) Harvard Analytical Framework
- (b) Moser Gender Planning Framework
- (c) Gender Analysis Matrix
- (d) Longwe Women's Empowerment Framework
- (e) Social Relations Approach

The present study uses both the Harvard analytical framework and the Moser gender planning framework.

2.1: The Harvard Analytical Framework, also known as the Gender Analysis Framework or Gender Roles Framework, is one of the earliest gender analysis and planning frameworks. This framework was developed by the Harvard Institute of International Development in collaboration with the Women in Development (WID) office of USAID. This framework is based on WID efficiency approach, which in turn is based on increasing women's income as a means towards empowerment (Diane 2002). According to the framework, allocating resources to women and men in development efforts makes economic sense and will make development itself more efficient.

The framework has a matrix for collecting data at the community and household level. It has four components: the activity profile; the access and control profile; the analysis of influencing factors; and the project cycle analysis (ILO 1998). The first component answers "who does what?", including gender, age, time spent, and location of the activity. The second component identifies the resources used to carry out the work identified in the first component, and access to and control over their use for each gender. The third component records factors that influence gender differences in the above two profiles. The fourth component examines an intervention in light of gender-disaggregated information. The framework also has a series of checklists consisting of key questions to be asked at different stages of the project cycle-identification, design, implementation and evaluation (ILO 1998).

This framework is best suited for project planning and baseline data collection. It makes women's role and work visible, and distinguishes between control to and access over resources. However, "it offers little guidance on how to change the existing gender

inequalities. It tends to result in gender-neutral or gender-specific interventions, rather than those that can transform existing gender relations" (ILO 1998).

2.2 Moser Gender Planning Framework: Caroline Moser has developed one of the most popularly used frameworks. It is a planning methodology aimed at the emancipation of women from their subordination and their achievement of equality, equity and empowerment. The framework consists of six tools. The first one is identification of gender roles. The triple role of women (women's role in production, reproduction, and community management) are identified by mapping the activities of household members over the course of 24 hours. The second tool, gender needs analysis, emphasizes that women have different needs from men due to their triple role and their subordinate position in many societies. It assesses the needs of women and men using categories of practical and strategic needs (World Bank). Practical gender needs, if met, help women with their current activities (provision for water). Strategic gender needs, if met, enable women to transform the imbalance of power between men and women (education, equal wages).

The third tool is the disaggregate control of resources and decision making within the households. It examines the differences in the control of and access to resources by asking "who controls what", "who decides what and how?" The fourth tool is a plan for balancing the triple role. It identifies how women manage their various roles, and seeks to clarify how planned interventions will affect each one. The fifth tool is used to consider how different planning interventions (welfare, equity, anti-poverty, efficiency and empowerment) transform the subordinate position of women. The last tool involves women, gender-aware organizations, and planners, in planning (World Bank 2010).

A recent complementary methodology to this framework is gender audit (Moser 1995). It aims to describe the impacts of gender mainstreaming in terms of three concepts: evaporation (where good policy intentions are not followed in practice), invisibilisation (where monitoring and evaluation procedures do not document what is actually occurring in practice) and resistance (when effective mechanisms block gender mainstreaming with opposition, essentially political, and based on gender-power relations, rather than on technocratic procedural constraints). The above framework is useful for planning at all levels from policies to projects. However, it is static and does not examine change over time as a variable.

3. Experiences across Countries

This paper has reviewed experiences of women in the mining sector, across the world. Generally most of the research on the impact of mining has shown that mining has a

negative impact on women. Yao (2006) has given a number of reasons why only a few women are employed in the coal mines of China. They are: availability of inexpensive male labour, cultural factors, and customs in traditional China, where it is regarded as ominous for women to be present in the mining tunnels. The custom of foot-binding also works against their mobility. Purevjah's (2010) study on mining in Mongolia shows that mining company job advertisements openly express a preference for male employees due to general hardness of the conditions, which are not suitable for women.

Dreschler (2001) uncovered the several factors that are contributing towards female participation in Artisanal and Small-scale Mining (ASM). They are: deterioration of subsistence farming (low prices of agricultural commodities, effect of droughts on farmlands, and lack of farmlands), low demand or lack of public and private employment, lack of trading commodities, high inflation rate, high birth rate, and extended families. Yakovleva (2007) found out the main drivers of female employment in Ghana gold mining. They are: need to bring income to households and lack of employment opportunities in the region. Furthermore, impoverishment of subsistence farmers is another main reason that forces women to join mining; while Amutabi and Lutta-Mukhebi (2001) found out that pressure on agricultural land, diminished fertility, high cost of agricultural inputs, unpredictable rains, and frequent droughts in are reasons that force women into mining in Western Kenya.

Though jobs in mining are highly paid in Mongolia, lack of enforcement of labour standards, and poor working conditions have resulted in many deaths and accidents among employees. As a result, a number of female-headed households and women's economic burden compel both women and children to also take up such high risk employment (Purevjah 2010). Therefore, the main question is what are the main gender issues in mining? In Asia, Europe, The Americas, or Africas, how does it change? Or is it same across the world?

3.1 Roles and Responsibilities

According to Lahiri-Dutt (2006), cultural attitudes towards what constitute male or female jobs result in occupational segregation, and its extent varies according to the specific nature of the job and the country in which the operation is located. In the Kaltim Prima Coal (KPC) mine of Indonesia, over half the female employees are in the "white collar" or administration-related sections, while there are a few female operators in the mines, driving heavy machinery and trucks day and night. According to her, women in Indian collieries were initially employed as "gin girls", but shifted to other surface and underground work when the mechanical system of lifting coal from shallow shafts was phased out. The main job for women until the early 1990s was as loaders of the coal cut by their male counterparts.

Though the mining industry employs women, their numbers are decreasing all over the world. Women miners drive heavy machinery in developed countries, but in India, women work mainly in "white collar" and "pink collar" jobs in the mining-related offices and research agencies (Lahiri-Dutt 2000). In the Raniganj coal region of India, there are three features of the skewed gender distribution in favour of male labour. They are: male labour migration in search of job opportunities, lesser economic and social opportunities for women, and gender bias in the coal mining industry (Lahiri-Dutt 2000).

In Burkina Faso, women do not normally work in the mining shafts. Traditional gold panning is exclusively practiced by women (post-menopausal) in southern Burkina Faso, while deep-shaft mining is a male domain. These mining camps show a clear gender discrimination of labour (Werthmann 2009)-miners, ore buyers, and gold traders are male. Breaking of ore with hammers is done by boys and men, while crushing of smaller pieces of ore with metal mortars and pestles is usually done by women and girls, though occasionally even men take up this activity. Both women and men from the local villages sell drinking water and firewood to the inhabitants of the mining camp; but as men own bicycles and donkeys for transport, they do this work in larger quantities. Men also own mechanical mills for grinding ore; and all the butchers are male, while providers of cooked food and sorghum beer are female (Werthmann 2009). Many girls and women work as petty traders, vendors of cooked food, waitresses, or bar girls, in the market area of the mining camp. Others work in a fenced-in area, the *comptoir*, where the ore is crushed, ground, and washed by day labourers. For women, the most profitable occupation in the *comptoir* is running a stall (*hangar*) for processing the ore.

In the gold mines of Ghana, one task mainly carried out by women is loading and transporting material. They are also engaged in panning, sluicing and separating gold. However, the final separation of gold is exclusively a male activity (Yakovleva 2007). Loading trucks with crushed ore and sand is a woman's job, while digging, crushing stones, and washing are carried out by men. Moreover, all underground work is also done by men.

In Western Kenya, women often engage in gold panning. They are also engaged in hawking food and other supplies to the miners and other buyers for a fee. Young girls also often engage in gold panning in the evenings after school, and during weekends and school holidays. Besides, the women prepare the children for school and the family breakfast, milk the family cows, attend to the family garden, buy provisions for breakfast, and set up daily order of family business enterprises. They also take care of other household chores like cleaning, washing, laundering and cooking as the men sit by (Amutabi and Lutta-Mukhebi 2001).

Heemskerk's (2003) study in the gold mines of Surinam shows that women manage mining operations, work as cooks and clean mining camps. Almost all of them are involved in retail marketing-they buy cigarettes, malaria medicine, and other products from the capital city and sell them in the mining areas at higher prices. Few of them own shops, which also serve as restaurants. There are a few female pit labourers, but porters, carpenters, or foremen are commonly men. However, most cooks, and all sex workers are women.

In artisanal mining, women have been a part of all operations including panning, carrying, washing, and sorting the ore for generations. And in countries like Ghana and Zimbabwe, women have started taking the same responsibility as their male counterparts by owning mining titles (Labonne 1996). The governments of these countries have formulated gender blind legislation to ensure that both women and men have access to mining titles.

Tallichet's (1995) study in the coal mines of West Virginia shows that women are involved in labour jobs, which involve mine maintenance. Such jobs require less skills, more strength, and endurance. According to the women, men's sexualisation has reinforced men's, particularly supervisors', stereotypical beliefs about women's incapability for doing more masculine-identified work. This has contributed to the gender typing of jobs. Organizational constraints like realignments of the work force and shift work, and non-availability of necessary training have negatively influenced women's advancement decisions.

In Mongolia, men and women do equal work across a wide range of ASM activities. They are: ore sack transportation, gold separation using water or by blowing, digging, lifting ore sacks from up to 20 meters deep holes, working inside deep holes and vertical tunnels, milling, crushing, and sluicing. Here women are also responsible for productive work at home, including food preparation, fetching water, gathering wood fuel, and caring for the children, elderly, and the sick (Purevjah 2010).

3.2 Assets/Resources and Constraints

In Burkina Faso, a few women own gold mining pits but leave the actual management to their male partners. With the money they make, they acquire plots, construct houses, and rent out. They also work as brokers between the black market traders and the gold miners (Werthmann 2009). Women in the rural areas of southwestern Burkina Faso do not have independent access to land and are less involved in cash crop production compared to men. They are less educated and earn a limited income by selling sorghum beer, snacks, clay pots, or baskets. They earn enough money to buy clothes or cooking pots, while the young men earn money for a cow or a moped. Therefore, a mining site

offers income-generating opportunities that would otherwise only be accessible through labour migration to distant locations (Werthmann 2009).

In the gold mines of Burkina Faso, there is a general suspicion that women have illicit sexual relationships with the gold miners. Added to this bad reputation, they also face health hazards and risks such as infections and work-related diseases, exploitation, lack of schooling, sexual harassment, violence, etc. There are several cases of divorce after the women refused their husbands' demand to refrain from going to the mining camp in order to pursue petty trade. On the other hand, the camp offers economic independence to divorced and widowed women (Werthmann 2009).

In Ghana's gold mining area, many women complain about common problems associated with carrying loads, which include headaches, waist, neck and back pains, and minor injuries such as cuts and bruises. The local health authorities also reported malaria, anaemia, hypertension, and diarrhea as the common diseases that affect women in mining. Besides, they are extremely vulnerable to HIV/AIDS and other sexually-transmitted diseases (Werthmann 2009; Amutabi and Lutta-Mukhebi 2001). In Western Kenya's gold mining areas, the presence of tuberculosis, meningitis, thinning and loss of weight, coughing, and wounds is common. Teenage children join mining camps to earn pocket money, and due to peer pressure.

In his historical study, Peter Alexander (2007) compared the key reasons regarding why in the first three decades of the twentieth century, women worked underground in Indian collieries, but not in those of South Africa. According to him, the reasons for this are technical requirements, economic pressure, cultural constraints, political campaigns, and legal imperatives. In India, women who worked underground were mainly family labour, who usually worked with their male counterparts as haulers. Secondly, employing women is advantageous as they are paid less. However, women were not always available for family labour. In course of time, public campaign acted as a catalyst to change, and legislation reduced the employment of underground women workers.

In South Africa, the collieries were mostly mechanized; they needed a regimental workforce and not family labour. Another reason of not recruiting women is that, with state support, they have access to Mozambicans, indentured Indians, and South Africans impoverished by taxation, in addition to land shortage and lack of support for African agriculture. There was also opposition to the employment of women, as Africans depend on women for the production of food. Finally acts in 1898 and 1911 banned women from underground work.

Pollock's (1996) study on Nauruan (a small island in the centre of the Pacific Ocean) women shows that they have maintained control over their land through matrilineal ties. Over the years, mining of phosphate has been very intrusive, and yet to bring an imposition of male control over those resources. When women received small rent on those lands, they spent it for family commitments, unlike men who invest it offshore and are considered rich.

Artisan mining is viewed as a way of making quick money to increase the traditional earnings which result from subsistence activities such as farming and trading. It provides women with new employment opportunities and results in higher income. It also helps women fulfill their social and economic roles (Labonne 1996). Tallichet's (1995) study shows that women in the first few years of their underground work encountered men's sexualization of work relations in the form of sexual harassment, propositioning, or sexual bribery. Women who failed to capitulate to a foreman's sexual demands usually got more difficult work assignments. Another punishment is social derogation designed to humiliate the women who refused sexual requests.

3.3: Decision-making Power

There is lack of activism among the women coal miners. Furthermore, lack of access to information and other subsistence bases have rendered them virtually powerless (Lahiri-Dutt 2000). Nauruan women are concerned about their land rights, and voiced these concerns at public meetings. Their individual land rights which were so closely protected and maintained over the mining years are now under threat. They are concerned that the government will necessitate nationalization of land in order to acquire the land required for rehabilitation (Pollock 1996). In artisanal mining as well, though women work under the same miserable conditions as the men, they are not equally compensated; hence they failed to attain the same decision-making positions as their male counterparts (Labonne 1996).

3.4: Needs, Priorities and Perspective

According to Werthmann (2009), "what women need in mining camps is practically the same they need in general: the possibility of earning a livelihood without being exploited or harassed, education and health care, and the protection of rights by impartial state authorities". Women's needs cannot be met if one focuses only on one issue and leaves out others. It is appropriate to listen to their decisions and what according to them are viable alternatives.

3.5: Benefits and Incentives

A major factor that has contributed to the adverse impact of mining on women is that they have largely been excluded from negotiations concerning benefits from mineral

development, including employment. As many studies have shown, women have not shared the benefits of mining; they are denied of higher wages and are subjected more to pollution and health hazards. This gender disparity in pay begins very early in life: in case of child labour, girls are paid in kind (food), while boys are paid in cash (Purevjah 2010); and for all age groups, wages are lower for girls compared to boys.

The female operators of heavy machinery in Indonesian coal mines (KPC) feel proud and self-confident as they are doing a difficult job. Their earning improves community welfare in the places of their origin (Lahiri-Dutt 2006). In many mining camps of Burkina Faso, women form networks or associations that offer assistance in cash or kind when a woman is in need, or intervene in cases of conflict with authorities, customers or partners (Werthmann 2009). There is some evidence of positive impact of mining on women, such as increased access to education and travel, improvement in infrastructure such as roads and transport, and thus, access to market (Purevjah 2010).

4. Conclusion

Experiences across countries shows that the situation of women involved in mining is the same across the world. As gender equality and empowerment of women is an important Millennium Development Goal, countries must work towards achieving the same. Promotion of alternative livelihoods is an option. However, alternative livelihoods promoted in the mining areas are often unattractive for the people working there, because income from mining is much higher. Credit schemes coupled with training measures are introduced by some development organizations to encourage women to pursue alternative livelihoods (Banchirigah 2008). Increasing the levels of education amongst women could improve their skills and level of participation in farming, trading, and small-scale mining, thereby encouraging them to become more proactive in securing loans, developing businesses, and improving the health of their families. Mining can only be an effective vehicle of economic development if gender concerns are built into every aspect of project development.

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