

MOTHERS in METALS & MINERALS

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Abbreviations:	
ASM	Artisanal and Small-scale Mining
CSR	Corporate Social Responsibility
DRC	Democratic Republic of Congo
GLR	Great Lake Region, Africa
SGBV	Sexual and gender based violence
USA	United States of America

1. Introduction

The arena of metals and minerals is always associated with perceived risks and therefore traditionally remained out of bound for women. Historically or presently, there is no such job which is completed by any one of the genders singly. On the eve of International Women's Day 2025, it is essential to relook into the matter of fostering sustainability through gender equality. This year's theme of International Women's Day is "**Accelerate Action**". Economy, security of a society is dependent upon metals and minerals. Like two eyes, male and female, both genders are constituents of a society. In this context, in the matters related to metals and minerals, it is essential to analyze role of women on historical perspective as well as in present day's context.

2. Women associated with Metal

Maria Salomea Skłodowska-Curie, (1867-1934), known as Marie Curie got interested in a mineral ***pitchblende*** (uraninite U₃O₈) because of its behaviour. She went on discovering polonium and radium, two radioactive elements. She won Noble Prize in 1903 along with Pierre Curie, her husband and Henri Becquerel, another physicist, for their outstanding contribution in radioactivity. She was mother of two daughters – Irène and Eve. Her husband died in a road accident. However, she dedicated herself for scientific work. But society is not a science laboratory. This respected and renowned scientist was drawn to a controversy of some romantic affair. So much so that, "On her return to France, Curie discovered an angry mob congregated in front of her home in Sceaux, terrorizing 14-year-old Irène and 7-year-old Eve. Curie and her daughters had to take refuge in the home of friends in Paris."^[1]

Marie Curie again won Noble Prize in 1911:

"...for her services in the advancement of chemistry by the discovery of the elements radium and polonium, by the isolation of radium and the study of

the nature and compounds of this remarkable element.”
--1911 Nobel Citation^[2]

Marie Curie was the only individual who had won Noble Prize in two branches of science – Physics and Chemistry. The unit ‘curie’ – a unit to measure rate of radioactivity in any substance was named after the title of Marie Curie and her husband Pierre Curie. The same is continued to be used in the field of radioactivity related science and technology.

Resilience and the attitude of not giving up, exemplified by Marie Curie are the two characteristics of female gender in general.

31 years after Marie Curie won her second Noble Prize, amidst World War-2, a project for Uranium enrichment started at Oak Ridge, Tennessee, USA in 1942. Originally, envisioned for 13,000 people, by 1945, there were about 100,000 people on any given day in this makeshift township covered with secrecy. In this project an instrument named as Calutron was used. Calutron is a mass spectrometer used for separating isotopes of uranium. These Calutrons at Oak Ridge's Y-12 Electromagnetic Isotope Separation Plant were operated and monitored by young girls who were just out of high schools. These girls were not knowing what for those machines were, they were only monitoring something on instruments, 8 hours a shift in the big halls full of electrical noise watching numbers of needle gauges. Their skill for adjustment of dials were found better than fiddling by scientists. In the book: *‘The Girls of Atomic City: The Untold Story of the Women Who Helped Win World War II’*, Denise Kiernan has beautifully mentioned stories of these girls, who were engaged in the process of uranium enrichment.

3. Vulnerability of Women in Metals and Minerals Sectors in Africa

Poverty, unemployment, geographically remote locations of mining areas, high value of minerals, long term and short-term conflicts, rowdyism, corruption, lack of rules and regulations, non-implementation of laws etc. give rise to sporadic mining of minerals in small scales. Often such mining has been termed as ASM. As defined by Jennifer J. Hinton the same is given below:

Artisanal and Small Scale Mining (ASM)

“Although a clear definition of artisanal and small-scale mining (ASM) has not achieved consensus, it commonly represents a spectrum of activities ranging in scale from small to large that is generally distinguished from “formal” mining by a relatively low degree of mechanization, high degree of labour intensity, poor occupational and environmental health standards, little capital investments and lack of long-term planning. With as much as 80% of activities taking place outside of a legal framework in some countries (ILO, 1999), ASM is typically an informal and highly disorganized activity.”^[3]

ASM assumes significance as the same may be an essential economic and social fabric. About vastness of ASM, Oil, Gas and Mining Policy Division of The World Bank Group has mentioned:

“There are generally no entry barriers: neither administrative, as it is mainly informal, nor financial, as it is essentially manual. Also, it typically requires little start-up time and very low capital or technical inputs, as for example in alluvial mining along rivers.

The number of commodities mined by ASM miners has been increasing through time. As a rule, artisanal miners would mine high-value minerals such as gold, diamonds, or colored gemstones, which together account for as much as 60% of all artisanal mining. In the Democratic Republic of Congo (DRC) as well as in Sierra Leone, artisanal gold and diamond mining accounts for more than 75% of national mining sector production. When taking into account construction materials and industrial, or other minerals, artisanal miners exploit more than 40 different minerals globally.”^[4]

Artisanal and Small Scale Mining does not automatically indicate any illegality, but the phrases like – ‘taking place outside of a legal framework’ and ‘neither administrative, as it is mainly informal’ in the above deliberations bear a notion of illegality.

Minerals like cassiterite, wolframite and columbite-tantalite are vastly available in Democratic Republic of Congo, Rwanda, Burundi and Uganda. These minerals give Tin, Tungsten and Tantalum minerals. In addition to these, there are gold, copper, diamond in the Great Lake Region of Africa. Plundering of this vast mineral wealth has been cited as one of the core reasons of violent conflicts in Democratic Republic of Congo. In a report titled as – “The Gender Dimensions of Tin, Tantalum and Tungsten Mining in the Great Lakes Region; Desk study, Final Version, 2 August, 2016” it has been mentioned that:

‘Women and girls constitute notable proportions of the ASM workforce (ca. 10-15% in 3T sites and 25-50% in gold sites) ----

‘A significant proportion of ASM communities in the GLR are comprised of vulnerable and disadvantaged groups, including elderly and youth, many of whom are disenfranchised and sometimes landless or displaced. Within these groups, women and girls face additional disadvantages mainly owing to discriminatory beliefs, impediments to their agency and bargaining power, the undue burden of women’s and girl’s work, and lack of access to and control of key assets and benefits derived from them. These mutually reinforcing factors jointly: restrict women’s and girl’s access to skills, education and training; impede their freedom to participate and influence decisions that concern them; relegate the majority to lowest-paying, lowest-ranking jobs, thereby rendering their work largely invisible; and ultimately increase their vulnerability to insecurity, ill health, sexual and gender-based violence and other dimensions of poverty.

‘Sexual and gender based violence (SGBV) is frequently used to operationalize harmful gender norms, beliefs, and values by reinforcing who is in control and who has the power. This ranges from grievous incidents intended to terrorize, as found in areas under rebel control in DRC, to more insidious forms of SGBV, such as discrimination,

exploitation, humiliation or intimidation in secure regions of the GLR. Those with greater authority have excessive impunity in most ASM environments.’^[5]

These issues of SGBV needs global attention. If anything, the theme ‘**Accelerate Action**’ calls for, then the same is to be done for those hapless women and girls subjected to SGBV in GLR of Africa.

4. Women in Mining in India

In their circular no. DGMS (Legis)/Circular No./02 dated 24-May-2019, Director General of Mines Safety under Ministry of Labour and Employment of Government of India has informed about ‘Equal employment opportunities for Women in mines and exemption from the provisions of Section 46 of the Mines Act, 1952 (Revised)’. Salient features of these provisions are given below:

(a) In the case of women employed in any mine above ground –

- i. The owner of a mine may deploy women between the hours of 7 pm and 6 am in the mine above ground including opencast workings;
- ii. the deployment of women shall be after obtaining the written consent of the concerned woman employee;
- iii. the women so deployed shall be provided with adequate facilities and safeguards regarding occupational safety, security and health;
- iv. the deployment of women shall be subject to the framing and implementation of Standard Operating Procedures on the basis of the guidelines issued in this regard by the Chief Inspector of Mines from time to time;
- v. the deployment of women shall be in a group of not less than three in a shift.

(b) in the case of women employed in any mine below ground –

- i. the owner of a mine may deploy women between the hours of 6 am and 7 pm in technical, supervisory and managerial work where continuous presence may not be required.
- ii. the deployment of women shall be after obtaining the written consent of the concerned woman employee;
- iii. the women so deployed shall be provided with adequate facilities and safeguards regarding occupational safety, security and health;
- iv. the deployment of women shall be subject to the framing and implementation of Standard Operating Procedures on the basis of the guidelines issued in this regard by the Chief Inspector of Mines from time to time;
- v. the deployment of women shall be in a group of not less than three.

After issue of this circular, women are increasingly participating in mining activities in both public and private sectors. In one of their iron ore mines, TATA Steel has introduced 'All-Women Shift', first ever in India. Women operates Heavy Earth Moving Machineries in this mine. Hindustan Zinc Ltd of Vedanta, the world's second largest integrated Zinc producer has appointed India's first woman underground mine manager and the formation of the country's first all-women underground mine rescue teams. The company aims at 30% women workforce by 2030.

All these show, Indian mines have left no stone unturned for gender equality in mineral sector.

5. Conclusion

Metal and Mineral sector is striving for prevention of environmental degradation. A motherly touch shall ensure heartfelt actions towards environment protection. It may be by afforestation, CSR activities, clean water provisions etc. A mother understands better than others.

Taking a cue from the reported gender-based inequalities and atrocities in mineral sectors in GLR Africa, it is suggested that governments of other countries take necessary pro-active steps to prevent illegal ASM and occurrence of such situations.

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References:

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