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Research Article

Socio-Economic Factors and Women Participation in Rwandan Mining Projects a Case of Rwanda Mining Association

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A B S T R A C T

This report presents a study conducted in Rwanda Mining Association to assess socio-economic factors and women participation in Rwandan mining projects. Specific objectives for the study were: To investigate the effect of socio-cultural and economic factors on women participation in mining projects; Determine the influence of company management procedures on women participation in mining project; and to examine the impact of mine sites working and living conditions on women participation in mining projects. Using purposive and simple random sampling technique, the target population of 835 workers (676 men and 159 women) was selected from 30 mining companies. The sample size of 270 respondents including 51 women and 219 men was also selected. Collected data was analyzed through SPSS software using chi-square and regression models. It was found that socio-cultural beliefsand Socio-economic factors have negative relationship with women participation in mining. Company management procedures (recruitment, workers' promotion and skillsdevelopment and job allocation procedures) applied in human resources management were also found to have negative effect on women participation in mining. The nature of mining work places, working and living conditions in terms of Occupational Safety and Health (OSH) of workers do not facilitate women integration in mining. Female workers face particular challenges such as being fired once they get pregnant and lack of work contracts. If mining is to contribute for poverty alleviation by eliminating inequality in accessing economic benefits in rural areas between men and women, all these factors should be addressed in a manner favorable to women. It is recommended that Community should be sensitized on how to develop good understanding on social responsibilities between men and women by balancing gender principles with socio-cultural beliefs. Positive work environment for all workers, both men and women should be established and respect of rights accorded to women in terms of OSH should be ensured as it is done in other sectors of activities.

Keywords: Culture, Gender Equality, Gender Mainstreaming, Mining, Mining Project

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Introduction

Mining in Rwanda is considered as one of important economic activities expected to highly contribute for handling poverty in rural areas mainly caused by lack of equal consideration of men and women in accessing economic opportunities. In most cases women are deprived from economic benefits in rural areas while they constitute a majority of active population. (MINECOFIN, 2013).

Within the extractive industry, uncovering reasons for low representation of women in mining workforce remains of big interest. Extractive industry's-specific workforces with related academic efforts have been found to be barriers that affect women engagement in the sector. (MIHRC, 2016).

Supported by strong political will on strengthening gender equality, the government of Rwanda has put much effort to promote women participation at all decision-making organs and successful results in different institutions have been achieved but mining in Rwanda is still a male dominated sector. According to existing statistics on mining workforce, women were represented at 16% in 2014 while in 2016 it reduced to 14%. (RNRA, 2016).

Problem Statement

Mining projects present challenges, opportunities and risks to sustainable development for women. Even though some mining projects have policies on empowering women, equal employment opportunity and even with recognition of the quality of having men and women in mining projects workforce, the impacts of their policies have long been questionable. The relationship between policy on gender equality by mining companies and their practices seems to be contradictory as mining continue to be a highly male dominated sector.(Pimpa, 2019). In the case of Rwanda, the mining sector has been set as one of important pillars for addressing the issue of poverty in rural areas caused by inequality in accessing economic resources between men and women where the later are vulnerable. (MINECOFIN, 2013). Despite of strong government political will to strengthen gender equality at all levels, mining continues to be a male dominated sector. At the end of 2014, women were represented at 16% while in 2016 this number has reduced to 14%. (RNRA, 2016).

Assessment of factors affecting women participation in mining projects starting from managerial, operational up to community levels would be an important input for setting up strong strategies to promote women integration in mining sector.

Research Objectives

General Objective

The main objective of the research study was to examine factors which contribute to low participation of women in Rwandan mining projects.

Specific Objectives

- To investigate the effect of socio-cultural and economic factors on women participation in mining;
- To determine the influence of company management procedures on women participation in mining;
- To examine the impact of mine sites working and living conditions on women participation in mining.

Research Questions

In order to realize research objectives and provide significant explanations to the research problem, the following questions were asked:

- How do socio-cultural and economic factors affect participation of women in mining?
- How do company management procedures influence women participation in mining?
- How do working and living conditions of mine work place affect women participation in mining?

Conceptual framework

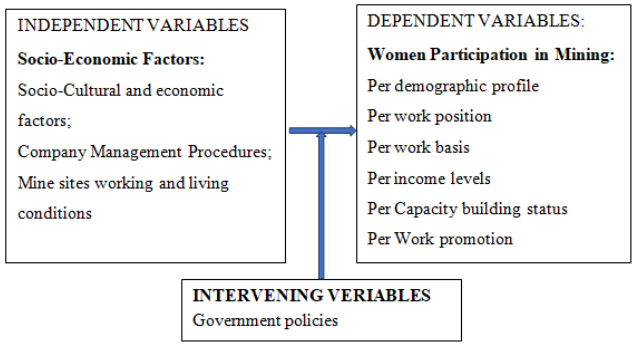

Figure 1.Conceptual framework

Research Design

This research has used descriptive and correlational research designs. According to (Jayanka K.N and Prianka S., 2015).

Target Population

The target population was comprised by the total population of 835 including 676 men and 159 women miners.

Sample Size

Slovene's formula was used to determine the sample size (Fadilah P. and Mohd H., 2017) with the error tolerance of 5%. Using the formula: $n = \frac{N}{1+Ne^2}$; Where: n = Number of samples; N = Total population and e = the margin of error estimated at 5%.

$$n = \frac{835}{1+835*0.05*0.05} = 270$$

To determine the number of men or women included in the sample from each selected company, proportion to size method has been used.

Table 1.Sample population

Province	Companies	Target population			Percentage			Sample		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
Kigali	1	28	24	4	3	86	14	9	8	1
	2	25	20	5	3	80	20	8	6	2
	3	21	17	4	3	81	19	7	6	1
	4	33	28	5	4	85	15	11	9	2
South	1	32	27	5	4	84	16	10	9	1
	2	30	26	4	4	87	13	10	8	2
	3	36	28	8	4	78	22	12	9	3
	4	35	28	7	4	80	20	11	9	2
	5	36	32	4	4	89	11	12	10	2
	6	24	20	4	3	83	17	8	6	2
	7	27	23	4	3	85	15	9	7	2
	8	22	19	3	3	86	14	7	6	1
West	1	32	26	6	4	81	19	10	8	2
	2	18	14	4	2	78	22	6	5	1
	3	24	20	4	3	83	17	8	6	2
	4	19	15	4	2	79	21	6	5	1
	5	21	18	3	3	86	14	7	6	1
	6	22	17	5	3	77	23	7	6	1
North	1	25	20	5	3	80	20	8	6	2
	2	23	17	6	3	74	26	7	6	1
	3	24	15	9	3	63	37	8	5	3
	4	28	23	5	3	82	18	9	7	2
	5	36	30	6	4	83	17	12	10	2
East	1	24	20	4	3	83	17	8	7	1
	2	23	20	3	3	87	13	7	6	1
	3	34	27	7	4	79	21	11	9	2
	4	24	20	4	3	83	17	7	6	1
	5	32	23	9	4	72	28	10	9	1
	6	41	31	10	5	76	24	13	10	3
	7	36	28	8	4	78	22	12	9	3
Total	**30**	**835**	**676**	**159**	**100**	**81**	**19**	**270**	**219**	**51**

Source: (RMB, 2019) and Researcher's calculations

Sampling Techniques

Purposive and simple random sampling techniques were used to select respondents.

Data Collection Methods

Primary and secondary data sources were used to gather information in this research.

Data collection Instruments

Questionnaires were used as instruments for data collection.

Research Findings And Discussions

Presentation of Findings

Findings from the research are organized, analyzed and

presented per objective. Each objective has its specific data collected to answer associated questions.

Investigating the Effect of Socio-cultural and Economic Factors on Women Participation in Mining

This research objective was achieved by using descriptive analysis for statistical data collected from respondents' perceptions on socio-cultural and economic factors as shown in the table 2 and 3 respectively.

The table 2, indicates that a big majority of women (94.1%) join mining activity not because they like it but because of poverty with no other alternative means to survive. Employment of women in mining is challenged with socio-cultural beliefs where 42.6% of females in this research confirmed that employment of women in mining is seen as against culture, while others (25.5. %) confirmed that community perceives them as prostitute.

Table 2.Perceptions on Socio-cultural factors and women participation in mining

Perceptions	Female		Male		Total	
	Freq.	**Perc.**	**Freq.**	**Perc.**	**Freq.**	**Perc.**
1. Could you work in mining if you had alternative job?						
No	48	94.1	6	2.7	54	20
Yes	3	5.9	213	97.3	216	80
Total	**51**	**100.0**	**219**	**100.0**	**270**	**100.0**
2. If No why?						
-Because combining house hold responsibilities with mining is very hard	9	19.1	0	0	9	17.0
-Because Mining is very hard and risky for fatal accidents	6	12.8	6	100	12	22.6
-Because, community perceived me as a prostitute	12	25.5	0	0	12	22.6
-Because my work in mining was seen as against culture	20	42.6	0	0	20	37.7
Total	**47**	**100.0**	**6**	**100**	**53**	**100.0**
3. If you earn much income, what will you do in future?						
-Continue working in mining	6	11.8	203	92.7		
-Leave mining for other businesses	45	88.2	16	7.3		
Total	**51**	**100.0**	**219**	**100.0**		

Source: Field data, 2019

The table 3, indicates a big difference between males and females' earnings from mining. Majority of male workers (74.4%) work on permanent basis which majority of them (13.5%) get a monthly salary of 85,000 Rwf. Women who work on permanent basis represent 9.8% only but however their monthly salary is very low comparing to that of permanent men workers as majority of permanent women (60%) get a monthly salary of 25,000 Frw only.

Table 3.Income distribution between men and women per mining work basis

Perceptions	Female		Male		Total	
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.
1. What is your work basis?						
Casual basis	46	90.2	56	25.6	102	37.8
Permanent basis/ Monthly	5	9.8	163	74.4	168	62.2
Total	**51**	**100.0**	**219**	**100.0**	**270**	**100.0**
2. If casual how much do you earn per day?						
1000	36	78.3	0	0	33	33.3
1500	9	19.6	3	5.4	12	12.1
2000	1	2.2	8	14.3	9	9.1
2500	0	0	4	7.1	4	4.0
3000	0	0	15	26.8	15	15.2
3500	0	0	8	14.3	8	8.1
4000	0	0	7	12.5	7	7.1
4500	0	0	6	10.7	6	6.1
5000	0	0	5	8.9	5	5.1
Total	**46**	**100.0**	**56**	**100.0**	**99**	**100.0**
3. If permanent, how much do you earn per month?						
25,000	3	60	0	0	3	1.8
30,000	1	20	6	3.7	7	4.2
35,000	0	0	8	4.9	8	4.8
40,000	0	0	5	3.1	5	3.0
45,000	0	0	11	6.7	11	6.5
50,000	0	0	15	9.2	15	8.9
55,000	0	0	12	7.4	12	7.1
60,000	1	20	21	12.9	22	13.1
65,000	0	0	0	0	0	0.0
70,000	0	0	19	11.7	19	11.3
75,000	0	0	18	11.0	18	10.7
80,000	0	0	10	6.1	10	6.0
85,000	0	0	22	13.5	22	13.1
90,000	0	0	5	3.1	5	3.0

95,000	0	0	7	4.3	7	4.2
100,000	0	0	4	2.5	4	2.4
Total	**5**	**100**	**163**	**100**	**168**	**100.0**
3. At which age would you leave mining?						
40	43	84.3	0	0	43	15.9
45	7	13.7	15	6.8	22	8.1
50	1	2.0	93	42.5	94	34.8
55	0	0.0	100	45.7	100	37.0
60	0	0.0	11	5.0	11	4.1
Total	**51**	**100.0**	**219**	**100**	**270**	**100.0**

Source: Field data, 2019

Table 4.Chi-square and regression results for objective I

Predictors	No		Yes		Total		P value
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.	
1. Do you think that social responsibilities affect your participation in mining							
Female	7	13.7	44	86.3	51	100	0.000
Male	204	93.2	15	6.8	219	100	
Total	**211**	**78.1**	**59**	**21.9**	**270**	**100**	
2. Do cultural beliefs in Rwanda support your employment in mining?							
Female	50	98	1	2	51	100	
Male	10	4.6	209	95.4	219	100	0.000
Total	**60**	**22.2**	**210**	**77.8**	**270**	**100**	
3. Could you work in mining if you had other sources of income?							
Female	47	92.2	4	7.8	51	100	
Male	5	2.3	214	97.7	219	100	0.000
Total	**52**	**19.3**	**218**	**80.7**	**270**	**100**	

Regression coefficients for the objective I

Predictors	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Social responsibilities	0.049	0.0335	1.46	0.145	-0.017	0.1149
Cultural beliefs	-0.36	0.0382	-9.45	0	-0.436	-0.285
Sources of income	-0.433	0.0433	-10.01	0	-0.518	-0.348
Cons	0.7811	0.0392	19.93	0	0.704	0.8582

Source: researcher's calculations, 2020

The regression model in form of becomes:

WP =0.78+ 0.049 SR -0.36CB -0.43 SI +; Where WP = Women Participation (Y); SR: Social Responsibilities (X_1) with a coefficient of. 0.049; CB: Cultural Beliefs (X_2) with (coef. = -0.36) and SI: Sources of Income (X_3) with a coefficient of -0.43 and the constant of 0.78. The chi-square results show that predictor variable related to social responsibilities for the objective one, has a positive effect (coef. 0.049) on women participation while cultural beliefs (coef -0.36) and sources of income (-0.43) have a negative relationship with women participation in mining. As social responsibilities in terms of fulfilling household needs increase with no alternative jobs in rural areas, more women especially single mothers tend to join mining as the only off-farm employment.On the other hand, as much as there is an increase of people who believe in cultural norms and traditions where employment of women in mining is negatively perceived by community when the number of alternative sources of income increase, the number of women who join mining will decrease and vice versa.

Determining the Influence of Company Management Procedures on Women Participation in Mining Projects

Assessing the effect of company management procedures on women participation in mining started by compiling data from different reports in mining companies' administration mainly focusing on domains involved in the management of workers as well as from respondents' perceptions about human resources management procedures vis a vis gender inclusion.

Table 5.Chi-square and regression results for objective I

Perceptions	Frequency			Percentage		
	Male	Female	Total	Male	Female	Total
1. What are the main challenges have you ever got during recruitment in mining?						
My candidature was not easily accepted by company management	0	6	6	0.0	11.8	2.2
My abilities to work in some mining activities was undermined by management	3	14	17	1.4	27.5	6.3
Required conditions to be recruited were complicated	0	22	22	0.0	43.1	8.1
Lack of information about vacant jobs in mining	56	7	63	25.6	13.7	23.3
No challenge	160	2	162	73.1	3.9	60.0
Total	**219**	**51**	270	100	100.0	100.0
In which activity are you allocated?						
Mineral washing and panning	14	54	68	27.5	24.7	25.2
Carrier of water/ore materials	31	75	106	60.8	34.2	39.3
Digging	0	40	40	-	18.3	14.8
Ground sluicing	0	24	24	-	11.0	8.9
Mine technicians	2	2	4	3.9	0.9	1.5
Ore grinding	2	14	16	3.9	6.4	5.9
Support services	2	10	12	3.9	4.6	4.4
Total	**51**	**219**	**270**	**100.0**	**100.0**	**100.0**
2. What would be the most reason for you to be allocated in low paid jobs?						
Managers undermine my capabilities to perform high paid jobs	11	19	30	5.0	37.3	11.1
High paid jobs require physical strength, skills and knowledge that I don't have	53	18	71	24.2	35.3	26.3
I don't feel confident to apply for high paid works	5	14	19	2.3	27.5	7.0
I am not concerned with low paid jobs	150	0	150	68.5	0.0	55.6
Total	**219**	**51**	**270**	**100.0**	**100.0**	**100.0**

3. In which activity have you ever been trained?						
Blasting	14	0	14	6.4	0.0	5.2
Digging	57	0	57	26.0	0.0	21.1
Ground sluicing	82	0	82	37.4	0.0	30.4
Grinding	41	2	43	18.7	3.9	15.9
Panning	22	8	30	10.0	15.7	11.1
No Training obtained	3	41	44	1.4	80.4	16.3
Total	**219**	**51**	**270**	**100.0**	**100.0**	**100.0**
4. Have you ever been promoted from low to high paid job?						
No	40	49	89	18.3	96.1	33.0
Yes	179	2	181	81.7	3.9	67.0
Total	**219**	**51**	**270**	**100.0**	**100.0**	**100.0**

Source: field data, 2019

The table 5, shows that different procedures applied in human resources management such as recruitment procedure, job allocation system, promotion procedures, skills development procedures, etc., are not favorable for the majority of women miners. Respondents confirmed that conditions set out for women to be recruited in mining jobs are complicated and even though they are recruited, they are allocated in low paid jobs because they don't have required knowledge and skills for high paid jobs. Besides, womenin mining do get the same chance for training as their men co-workers. The other issue is that even though women get the same knowledge and experience as men, company management undermines their capabilities to perform some mining activities as men. Promotion rate is very low for women miners (3.9%) comparing to that of men co-workers (81.7%).

Using chi-square test and regression models, through SPSS software, independent variables have been tested to check whether they are correlated with dependent variable or not.

Table 6.Chi-square and regression results for objective 2

Predictors	No		Yes		Total		P value
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.	
1. Do you think recruitment procedures are favorable for your participation in mining							
Female	47	92.2	4	7.8	51	100	
Male	14	6.5	203	93.5	217	100	
Total	**61**	**22.8**	**207**	**77.2**	**268**	**100**	**0.000**
2. Do you think job allocation procedures are favorable for your participation in mining?							
Female	40	78.4	11	21.6	51	100	
Male	15	7	200	93	215	100	
Total	**55**	**20.7**	**211**	**79.3**	**266**	**100**	0.000
3. Do you think skills development procedures support your employment in mining?							
Female	49	96.1	2	3.9	51	100	
Male	0	0	216	100	216	100	
Total	**49**	**18.4**	**218**	**81.6**	**267**	**100**	0.000

4. Do you think Employee promotion procedures are favorable your participation in mining?							
Female	39	79.6	10	20.4	49	100	
Male	52	23.7	167	76.3	219	100	
Total	91	34	177	66	268	100	0.000

Regression Coefficient for the Objective 2

Predictors	Coef.	Std. Err.	t	P>t	95% Conf.	Interval
Recruitment Procedures (RP)	-0.0483	0.0212	-2.28	0.024	-0.09	-0.006
Job Allocation Procedures (JAP)	-0.0343	0.0182	-1.88	0.061	-0.07	0.0016
Skills Development Procedures (SDP)	-0.919	0.0266	-34.49	0	-0.97	-0.866
Employee Promotion Procedures (EPP)	-0.0095	0.0128	-0.74	0.458	-0.03	0.0157
Constant	1.0122	0.0135	75.24	0	0.986	1.0387

Source: Researchers calculations, 2020

Using the regression model, we have:

WP =1.01 -0.0483SDP -0.0343WDP -0.919EPP - 0.009 + ε

(WP: Women participation; SDP: Skills Development Procedures; EPP: Employee Promotion Procedures).

The model shows that comparing to other independent variables, skills development procedures with the coefficient of -0.919 present high negative relationship with the dependent variable. This implies that if no improvement is done on current skills development procedures, women participation will decrease more and more.

Examining the Impact of Mine Site Working and Living Conditions and Women Participation in Mining

This objective was assessed based on respondents' perceptions about the status of mining work places as well as their working and living conditions on mine sites.

Table 7.Challenges of mining nature and working and living conditions

Perceptions	Female		Male		Total	
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.
1. Do you think that mining work places present particular challenges for your work?						
No	3	5.9	211	96.3	214	79.3
Yes	48	94.1	8	3.7	56	20.7
Total	51	100.0	219	100.0	270	100.0
2. If yes what are they?						
Fear for tentative sexual violence	10	20.8	0	0	10	17.9
Fatal accidents	15	31.3	6	75	21	37.5
Fear for walking long distance	23	47.9	2	25	25	44.6
Total	48	100.0	8	100	56	100.0
3. Are many working hours a challenge for your work in mining?						
No	8	16	213	97.3	221	81.9
Yes	43	84	6	2.7	49	18.148
Total	51				270	100.0

4. Do you think that OHS basic rights associated with your work are respected?						
No	45				60	22.2
Yes	6				210	77.8
Total	51				270	100.0
5. If no which of your rights are violated?						
Being fired when you are pregnant	12					21.1
Lack of contract	30					78.9
Lack of necessary facilities	3					0.0
Total	45					100.0
6. Do you have work contracts?						
No	47					21.8
Yes	4					78.2
Total	51					100

Source: field data, 2019

The Table 7, indicates that of 94.1% of female workers confirm that mining work places present particular challenges for their work mostly due to the nature of mine site's location. In fact, majority of women (47.9%) confirmed that they fear to walk long distance from work place to their home while others (31.3%) fear working in underground shafts. The issue of tentative sexual harassment when working in underground has been also said to be a challenge for 20.8% of female respondents. On the side of males, majority of them (96.3%) confirmed that mining activity does not present any challenge for them.

Regarding the Occupational Safety and Health conditions (OSH), the Table 7, shows some work basic rights are not respected for the majority (88.24%) in such way that 92.3% of women respondents do not have work contracts while 26.7 % confirmed that being fired once become pregnant is a challenge for them.

Using scientific method through chi-square and multiple regression analysis, two predictors, the nature of mining activity and the OSH conditions applied in mining were assessed to check, correlation and effect between independent and dependent variables.

Table 8.Chi-square and regression results, Objective 3

Sex	No		Yes		Total		P value
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.	
1. Is the nature of mining work places favorable for improving your livelihood?							
Male	75	34.2	144	65.8	219	100	
Female	38	74.5	13	25.5	51	100	
Total	**113**	**41.9**	**157**	**58.1**	**270**	**100**	0.000
2. OSH conditions are favorable for your participation in mining?							
Male	77	35.2	142	64.8	219	100	0.000
Female	41	80.4	10	19.6	51	100	
Total	118	43.7	152	56.3	270	100	

Regression coefficients for the objective 3

Predictors	Coefficients.
Nature of Mining workplace (NMW)	-0.154625 (≈ -0.15)
OSH conditions (OSH)	-0.195156 (≈ -0.19)
Constant	0.156156 (≈ 0.16)

Source: Researcher's calculations 2020

The multiple regression model in the form of: $Y = \delta_0 + \delta_1 t_1 + \delta_2 t_2 + \varepsilon$ for the objective 3 becomes WP = ε - 0.15 NMW- 0.19 OSH+0.16.

Where WP= Women Participation; NMW = Nature of mining workplaces and OSH =Occupational Safety and Health.

Both two predictors affect women participation negatively and it is shown that the OSH predictor has a high negative effect on women participation comparing to the nature of mining work. This would mean that at the extent working and living conditions become more deplorable, the participation of women in mining decreases and vice versa.

Conclusion and Recommendations

Conclusion

Since 1930 when mining started till now, Socio-cultural factors have been forcing minds of Rwandan community to behave in a way to conclude that mining is for men not for women and hence consider gender inequality in mining as inevitable. Procedures applied in human resources management of mining companies do not at all leave audience to women for joining mining. Socio-cultural factors in terms of social responsibilities and cultural beliefs as well as demographic factors in terms of marital status (married, widowed, single, single mothers, etc,), affect women participation in mining either positively or negatively. Nature of mining work-places and OSH conditions not favorable for women do not allow them to feel mining as easier for them and prefer not joining it.

If mining is to contribute for poverty alleviation in rural areas and especially eliminating inequality between men and women in accessing economic benefits in rural areas, all these factors which affect women participation in mining negatively should be addressed in a favorable manner to women.

Recommendation

Mobilization at community level in general and at company level in particular aiming at improving common understanding about equal sharing of economic resources between men and women would help community to change their mind on equal role on performing economic activities.

For effective social inclusion in benefiting from mining resources, all components of human resources management should reflect gender equality, starting from workers recruitment planning, allocation of jobs to workers, skills development, workers promotion and workers retention strategies should focus to both men and women.

Strong strategies should be put in place by mining regulators to address poor OSH conditions especially associated with employment of women in mining in order to ensure that gender principles are considered as a standard for mining best practice.

Study trips and peer learning methods between mining companies with good records about gender inclusion in their mining operations and those with poor records can be used.

Improved working and living conditions of mine work places in terms of establishing positive work environment for all workers and especially for women is an important input to integrate

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