

# The Perception on Women Working in Core Mining Environment

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**KEYWORDS** Women. Mining. Transformation. Skills Development

**ABSTRACT** Until 1996, all women in South Africa were prohibited, by law, from working underground. With the introduction of the Mining Charter all, this changed and companies started hiring women for different positions. The objectives of the study were to determine the perceptions about women working in core mining environment, of the working environment of women in the mining activities, to establish what changes were made to accommodate women in this specific mine, and to determine if women can advance to senior positions within this company. A field study was conducted at a chrome mine, and a random sample of 100 employees participated part in the study. The central research tool utilised was a questionnaire using a Likert-5 type rating scale. The findings were that whilst a lot has happened since 1996 to create an environment that is accommodative to women working in the mining sector, mining companies would still have to work hard to change the perception that women are not wanted in the mining industry. There is a lot of resistance towards women working in the core mining industry. Mines are making changes to accommodate women. Women are receiving a lot of support from management to become part of the mining environment.

## INTRODUCTION

Historically, the mining industry has been dominated by the perception that it was exclusively for male workers. This perception was even enforced by legislation set out by various governments. In the early 1900s, Article 2 of the International Labour Organisation's (ILO) Convention 45 of 1935 came into play, forbidding the inclusion of women in underground mining. The article stated, "No female, whatever her age, shall be employed on underground work in any mine." In South Africa, legislative barriers also prevented women from working underground until relatively recently. The South African Minerals Act of 1991 banned women from working underground (Simango 2006:15). In 2002, the South African Mining Charter was instituted to address the imbalance that existed in the industry (AngloGold Ashanti 2007 Annual Report to Society). The charter required mining companies to ensure that 10 percent of their total workforce were women by 2009, as compared to only 2 percent in 2000 (Mlambo 2011). The charter also allowed women to work underground, rather than only on the surface. This change created various new

challenges for the mining community. Regardless of all these challenges, according to statistics from the Chamber of Mines, in 2000, only 3.2 percent of mineworkers were women, a figure that rose to 10.1 percent in 2010, in line with government's goals, outlined in its 2010 Sector Skills Plan draft paper, 10 percent women in mining by 2013 (Chamber of Mines 2010).

## Problem Statement

The inclusion of female workers underground was not without a great deal of resistance. Because of females' special needs, mines had to make changes to accommodate female workers. Suitable toilets and change rooms needed to be set up (AngloGold Ashanti 2007 Annual Report to Society). The protective gear that is worn underground also presented few challenges, such as being one-piece overalls, the women needed to remove the entire suit to use the toilet (Mlambo 2011). Another challenge that women face is the extreme heat that miners have to work in underground (Mlambo 2011). Probably the biggest challenge that mines faced was the inadequate and inappropriate housing that they provide for workers (Mashiane 2011:3). The main problem with this forced implementation of female workers into the mining area is that there are still severe challenges and perceptions that women do not belong in a physically tough work environment, such as underground mining.

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Across all cultures, there is still the expectation that women should have children early, but in doing this they will not be in a position to attend to their original professions. Women obtain degrees, but once graduated, they marry and have children (Campbell 2007:8).

### **Objectives of the Research**

#### *Primary Objective*

- ♦ To establish the perceptions of women in core mining activities of the work environment.

#### *Secondary Objectives*

- ♦ To establish what changes were made to accommodate women in this specific mine.
- ♦ To establish whether women can advance in this company.

### **Literature Review**

The mining industry has been known globally as a male-dominated industry throughout the ages. In 2002, the South African Mining Charter was instituted to address the imbalance that existed in the industry (AngloGold Ashanti 2007 Annual Report to Society).

#### *Global Perspective*

Globalisation has not only altered the environment for doing business in South Africa, but also quite dramatically exposed inherent fault-lines in business organisations in the country. Globally, the environment has become more competitive and dynamic, so that various leaders throughout the world have realised the need to make changes in their way of operating if their organisations are to survive (Kotter 1990).

According to Mihail (2006), on a global scale, women represent a relatively untapped source of talent in the workplace. Even though progress has been made over the last decades, barriers to women's advancement continue to persist.

Burke (2001) argued that the trend of women entering the workplace has increased in numbers over decades in all developed and developing countries: their pursuits of education have shifted to the professions of business management, engineering and computer science. Burke

(2001) further confirmed that women have made great strides in entering management in various professions; however, this has not transformed the way in which business perceives women globally.

According to Kephart and Schumacher (2005), women have been struggling within all types of organisations for equal roles and equal respect alongside their male counterparts for years. The South African mining environment is no different when it comes to inequality of gender. The South African Minerals Act of 1991 banned women from working underground (Simango 2006: 15). In 2002, the South African Mining Charter was instituted to address the imbalance that existed in the industry (AngloGold Ashanti 2007 Annual Report to Society).

#### *Ethical and Cultural Factors Influencing Females*

According to Kaplan (2001: 221), women in the world, who are lacking rights, are more oppressed and subordinated within familial and cultural relations. This argument is extended by Wilson (2001: 25) who states that globally 'rights' have become the archetypal language of democratic transition. Rights have come to signify the terms of democracy, morality and social justice, the notion of equality. Especially the rights of women are on the foreground now. Historically, women stayed at home and looked after families, but that all changed since women's rights became a priority. Singer (2002: 1) indicated that social responsibility remains a big challenge for women because the majority of women in mining are single mothers, and often these women have limited schooling.

Forastieri (2002) indicated that women's responsibility towards their own households involves that they need to perform a large part of household duties on their own and, as such, these women suffer from excessively long working hours per day inclusive of the underground shift work. Forastieri (2002) stated that women, if exposed to the abovementioned working hours, could suffer the following effects: health problems such as stress, chronic fatigue, premature ageing and other psychosocial and health effects. The tension between cultural and gender rights should be framed in pragmatic, political terms, rather than moral terms. This was the basis of the development legislation to address

inequality and subordination of women in general (Deveaux 2003: 1).

Gouws (2005: 27) explains that '(t)he social and cultural diversity amongst South African women, the vast inequalities in livelihoods and social capital, the array of political-ideological positions and the violently-imposed, radicalised fissures of apartheid. Women are divided by race, class, ethnicity, region, religion, sexuality, and generation.' Gouws (2005:1) further states that "(w)omen have expressed a great gender awareness and activism during the transition period to democracy and have managed extremely high levels of gender based violence such as rape and domestic violence.' Gouws (2005:36) also indicated that African women living under customary law and traditional law are deeply associated in terms of equality rights and cultural rights. She also argues that the opposite of equality is inequality. Ignoring women's differences with men reinforces and reintroduces inequality; these differences can lead to another form of exclusion through which non-dominant groups or groups within non-dominant groups, such as black women, could be excluded from development.

Campbell (2007: 8) reported that '(i)n South Africa, across the cultural spectrum, there is still a social expectation that women should have children early, but if they do this, they will have no time to establish themselves professionally and it is not clear whether they will afterwards be employable in their original speciality.' Campbell (2007: 8) continued by saying that '(t)here is strong social support for women to get university education, but once they have graduated, the pressures to marry and have children pile up again; this is a cultural issue and so difficult to overcome.'

### **Retention**

As indicated by Campbell (2007: 8), the percentage of women working in the mining industry is increasing. Mining companies employ many women, but in support functions, such as administration, human resources, public and investor relations, finance, audit and legal. The consensus of women in mining is that participation should refer to women employed in technical positions and in the productive workforce. Considerable progress has been made in attracting young women to study mining engineering

at university (Campbell 2007: 8). "The real problem, the industry is now discovering, is retaining its female technical and production staff" (Campbell 2007: 8).

The same author states that it is not only other mining companies that poach the female mining engineering graduates, but also companies in completely different sectors of the economy. These companies offer less physical, more comfortable jobs, with higher salaries and higher social status and are more family friendly.

Campbell (2007: 8) states that issues such as the social environment underground, sexual harassment or sexual intimidation or assault, the physical challenges of working underground or the physical environment are all factors that cause women to leave the underground working environment. To improve retention, the company also needs to identify places and jobs suitable as entry-level positions for women. There are of course certain physical constraints between men and women and companies will need to manage these constraints to ensure that they retain the female miners in their company.

Ranchod (2001: 29-33) advised that if a company wants to ensure sustainable development in regions where mining companies are operational, female participation must be increased to ensure that the local economies of those regions benefit by a reduction in poverty, specifically among women.

### **Resistance to Change**

McCulloch (2003:418) indicated that mining and hard manual labour have always been associated with masculinity. Schutte et al. (2002) indicated that there are physiological issues to be taken into consideration. "Women are not physically identical to men; specifically for mining, and the differences in physiological make-up must be accommodated." According to statistics from the Chamber of Mines, in 2000, only 3.2 percent of mineworkers were women, a figure that rose to 10.1 percent in 2010, in line with government's goals, outlined in its 2010 Sector Skills Plan draft paper, 10 percent women in mining by 2013 (South Africa. Chamber of Mines 2010).

On this basis of deeply embedded practices, the industry will therefore be very reluctant to change certain practices with specific reference to the female employment in this historical male-

dominant arena of the mining industry (Fourie 2009). Whittock (2002: 449) described the phenomenon of stereotypical male beliefs indicating that women do not pass the mental and physical endurance to perform the inherent job requirements of underground work because women are too weak and therefore promulgate legislation to exclude women from the underground workings. Whittock (2002: 450) emphasises that assumptions related to rules, behaviour, ability and needs of women still exist within organisations; this being said, it is clear that organisations must prioritise challenges that exist with specific reference to sex stereotyping.

Lazcano (2003: 4) discusses the existence of discrimination against women for reasons related to beliefs that women contaminate work processes. Mines are bastions of resistance to change.

### **South African Perspective**

The Department of Minerals and Energy (No Date) has made public statements in various reports, publications, conferences and seminars that it is strongly committed to resolving the issues that women experience in mining. The Department acknowledges that there are a number of matters that need to be addressed, as this is a relatively new concept in South Africa.

South African society is still getting used to women in the workplace. There have been great advancements and a number of very positive events. However, there are still a number of remaining challenges. The emancipation of women in South Africa requires national liberation, the transformation of gender relations and an end to exploitation. According to (Horn 1991), this can only be addressed as part of a total revolutionary transformation of South African social and economic relations. "National liberation does not automatically guarantee the emancipation of women" (South Africa, African National Congress Programme of Action 1990).

Since the research problem's theme is workplace inclined, a need to start by defining legislation relevant to the study is important in order to understand the fit of the industry in question with regard to compliance with legislation.

In the early 1900s, Article 2 of the International Labour Organisation's (ILO) Convention 45 of 1935 came into play, forbidding the inclusion of women in underground mining. The arti-

cle stated, "No female, whatever her age, shall be employed on underground work in any mine." In South Africa, legislative barriers also prevented women from working underground until relatively recently. The South African Minerals Act of 1991 banned women from working underground (Simango 2006: 15). Section 9 of the South African constitution precludes discrimination based on gender. With the adoption of the Mine Health and Safety Act in 1996, restrictions on women working on mines, including underground, were lifted. Current South African legislation on women and mining is more progressive than existing international norms and practices.

### ***Employment Equity***

South Africa's Employment Equity Act of 1998 (Act 55 of 1998) aims at "implementing positive measures to redress the disadvantages in employment experienced by black people, women and people with disabilities, in order to ensure their equitable representation in all occupational categories and levels in the workforce" and requires an employment equity plan (Section 17) and monitoring thereof (Section 21). The Employment Equity Act requires the employer to identify barriers for equitable relations and optimum performance by their employees as well as a draft programme, which can address and eliminate the identified employment barriers (Fourie 2009).

Implications of the Employment Equity Act for the mining industry include the need for training opportunities to be extended more proactively to women, and the active promotion of qualified women within the mining hierarchy.

### ***Skills Development***

The purpose of the Skills Development Act of 1998 (Act 97 of 1998) is to "provide an institutional framework to devise and implement national, sector and workplace strategies; to develop and improve the skills of the South African workforce; to integrate those strategies within the National Qualifications Framework contemplated in the South African Qualifications Authority Act, 1995; to provide for learnerships that lead to recognised occupational qualifications; to provide for the financing of skills development by means of a levy-grant scheme and

a National Skills Fund; to provide for and regulate employment services; and to provide for matters connected therewith.”

### ***Mining Charter***

In October 2002, the South African Mining Charter was instituted to address the imbalance that existed in the industry (AngloGold Ashanti 2007 Annual Report to Society). The Department of Mineral Resources together with mining industry stakeholders, including the chamber of mines, South African Mining Development Association and the National Union of Mine Worker signed the Mining Charter. The Charter required mining companies to ensure that 10 percent of their total workforce were women by 2009, as opposed to only 2 percent in 2000 (Mlambo 2011). The Charter also allowed women to work underground, rather than only on surface. After five years, the stakeholders met to review the progress. The results revealed that only 26 percent of mining companies have complied with the 10 percent women participation in mining. However, the average rate of women participation is 6 percent, the bulk of whom are represented in support functions with less than 1 percent in core management positions, a large proportion of which represents a preserve for white women (Mining Charter Impact Assessment Report 2009: 2). Before the Mining Charter was instituted, women were not allowed to work underground (Simango 2006: 15). The objective of the Mining Charter (2002) is to create better opportunities and benefits for women and their dependents, a group identified as historically disadvantaged South Africans.

### ***Transformation***

In 2002, the South African Mining Charter was instituted to address the imbalance that existed in the industry (AngloGold Ashanti 2007 Annual Report to Society). The vision of the original charter was: “To facilitate sustainable transformation, growth and development of the mining industry” (Anon. 2010a). South Africa has launched a new charter to facilitate the sustainable transformation and development of its mining industry, with an emphasis on a target of 26 percent black ownership of the country’s mining assets by 2014 (Anon. 2010b).

### ***Affirmative Action***

The Employment Equity Act of 1998 drives affirmative action. The objectives of the Act were later infused into the broad-based economic empowerment scorecard. They were given a range of targets spanning a period of 10 years from the date of inception. Equity is further affirmed in the Promotion of Equality and Prevention of Unfair Discrimination Act (Act 4 of 2000). The imperative of redressing historical and social inequalities, as stated by the Constitution of the Republic of South Africa, in, *inter alia*, section 9 (equality and unfair discrimination) resides in the Bill of Rights (Fourie 2009). Therefore, employers must give preference to ‘suitably qualified people’ from designated groups. Designated groups are defined as women, black and coloured men, and people with disabilities (Fourie 2009).

### ***Black Economic Empowerment***

South Africa’s policy of black economic empowerment (BEE) is not simply a moral initiative to redress the wrongs of the past. It is a pragmatic growth strategy that aims to realise the country’s full economic potential while helping to bring the black majority into the economic mainstream (Anon). The mining industry has adopted a proactive strategy of change to foster and encourage black economic empowerment in the form of ownership, management, employment equity, procurement and rural development (Mining Charter 2002). Ranchod (2001: 27) is of the opinion that the mining industry still indicates tendencies and preferences to employ white women in the professional and more elite positions, whereas the positions in the industry relating to underground occupations are more likely still occupied by black women. Price (2002: 102) concluded that race should be reflected in the design and measurement of the impact of employment schedules and programmes for both female and male counterparts alike.

### ***Industry Perspective***

South Africa is one of the world and Africa’s most important mining countries in terms of the variety and quantity of minerals produced. It is the leading source of nearly all of Africa’s metals and minerals production apart from diamonds (Botswana and the DRC), uranium (Niger), cop-



per and cobalt (Zambia and the DRC) and phosphates (Morocco). Only crude oil and bauxite are not found here.

For at least the last fifteen years, the South African mining industry has been a job-shedding industry; therefore, the enabling policy and legislation allowing women to participate in mining have not been matched by job-creation opportunities in the sector.

Compared to other employment sectors, women's integration into mining has been slow, and while some progress has been made, women working underground are very much a novelty in South Africa, with images of women mine-workers occupying headline news. This sector is often associated with unsafe working conditions, a historically unregulated policy environment and a lack of appropriate mining technology. Women enter small-scale mining primarily as a means of survival.

Mining continues to support and stimulate growth and development in the country. Mining companies contribute extensively to South Africa's tax base; rail, road and port development is more often than not spurred on by the development of new and extended mining operations; new towns are established in mineral-rich areas; it attracts new investment into the economy; it leads the way in empowerment, skills development and transformation; and it injects over R40 billion into the economy via wages (Chamber of Mines 2008).

### *Selection Criteria for Underground Female Workers*

The underground environment can be defined as dark and damp, and with an increase in temperature relative to an increase in depth (Fourie 2009). The circumstances include an environment in which employees are often required to work alone, work in confined spaces, sometimes without any communication technology and in the form of self-directed teams with little direction from senior supervisors (Singer 2002: 1). Working conditions are difficult and sometimes vary hazardous. Wynn (2001) considered the underground environment as harsh and it will be required of women to have a high level of overall fitness. Tasks could specifically include:

- ♦ The physical capability to perform tasks such as lifting or carrying relatively heavy objects,

- ♦ The ability to pull objects across various inclines or flat rough surfaces,
- ♦ The ability to install heavy objects considering all the mentioned requirements,
- ♦ A degree of difficulty to perform these tasks in areas of confined spaces in which the humidity and temperature are high, and
- ♦ These physically draining requirements are to be performed daily for the majority of the underground shift and for extended periods.

Ranchod (2001:31) stipulated the consideration of physical facilities such as ablution facilities and change rooms specifically designed and equipped for women and bi-sexual toilet facilities.

Wynn (2001) stated that women working in physical environments such as mineral processing plants and in the underground workings of a mine do perform routine tasks; for example, conducting sample tests and carrying them through the processing plant by means of carrying bags and, in doing so, require them to open ventilation doors that are under pressure. He continued to say that women do require some degree of physical fitness and strength to perform these mentioned tasks. Although physical fitness and strength are certainly a requirement, it is also clear that different equipment requires different techniques and skills that may even vary in complexity.

Singer (2002: 2) concurs and explains that the workload required is often gruelling.

The underground mining environment has unique challenges and therefore the mining sector was not seen or marketed as a good career choice for professional women and, at the lower levels, the industry has traditionally drawn its labour from a largely male workforce (Fourie 2009). Schutte et al. (2002) indicated that there are physiological issues to be taken into consideration. "Women are not physically identical to men; specifically for mining, and the differences in physiological make-up must be accommodated. These are not insurmountable, but they must be managed." If this is then considered, it will be a management requirement to evaluate work categories based on physical requirements. Schutte et al. (2002) also indicated the following:

- ♦ There are four categories of physical constraints facing people working in South African deep-level mines: aerobic capacity;

heat tolerance; functional strength and body dimensions. These all affect the ability to do work, especially in hot conditions.

- ♦ Aerobic capacity is the capacity to perform work in which the body uses oxygen, such as high physical intensity work lasting more than five minutes. “Women’s maximum aerobic capacity is 15 percent to 30 percent less than men’s,” he reports. As a result, women doing the same physical task as men will tire more quickly. Women are also less tolerant of heat than men. On average, 35 percent of women are heat intolerant, as opposed to only 5 percent of men.
- ♦ Concerning functional body strength – important in an industry where many tasks are still manual – women have less than men. Women also have less lift and carry capacity, because they are generally smaller, shorter, and lighter, with shorter arms than men. The hand and arm strength of women are, on average, 70 percent of that of men. However, when it comes to whole body pushing and pulling, women are at less of a disadvantage, averaging 80 to 90 percent of what men can do.
- ♦ Body dimensions are important with regard to the design of mining equipment and its efficient operation. Much of the equipment used in South African mines is designed overseas for use by men (and, indeed, women) who tend to be significantly taller than the average South African woman.

It can be concluded that the mining industry is physically very demanding on all underground employees on a daily basis for extended periods, requiring employees to spend the majority of their underground shift to perform physical tasks.

Despite legislation and various other initiatives, female miners are not given any privileges. Singer (2002: 2) highlighted that female underground employees must also pass the same induction and other screening tests as the male employees. The selection criteria consist of numerous physical testing procedures, such as the requirement to climb up and down steps for half an hour in an acclimatising room heated to a predetermined temperature, equal to the temperature underground, to test employees’ capacity to perform work in high temperatures. Singer (2002: 2) indicated the basic requirement to ensure employment is because the potential test

candidate successfully completes the acclimatisation step test without fainting, and as such qualifies for the physical examination and is then eligible for employment.

Ranchod (2001: 28) indicated that women differ from men both physically and physiologically, and a workplace or work system, including technology, designed for men could in some respects be unsuitable for women.

Schutte et al. (2002: 817) referred to findings indicating that female mineworkers had difficulty in passing the standard heat tolerance test used by mining companies in South African. The consequences of high environmental heat loads can be expressed in terms of impaired work capacity, errors of judgement, and the occurrence of heat disorders, especially heat stroke, which is often associated with severe and irreversible tissue damage and high mortality rates. Schutte et al. (2002: 817) also concluded that the female body is significantly less adaptable to hot environments, specifically if she is in the premenstrual cycle. They continued with a generalisation that under conditions of high ambient temperature and low humidity thermoregulation in women is “less efficient” than in men.

Singer (2002: 2) evaluated male and female workload output and indicated that females in general find it difficult to complete certain tasks based on physiological differences. Specific reference is being made to hauling of rock and clear indications are that women cannot haul as much rock as most of the male workers do. The implications for mine management is that certain work categories do require a minimum output level in terms of physical capability and if the females do not deliver the required outcome the potential impact will be:

- ♦ Potential loss of production;
- ♦ Increased risk of injury;
- ♦ It could require more employees to perform the same output levels as previously achieved by the male employees, and therefore a higher labour cost component.

McCulloch (2003: 418) indicated that mining and hard manual labour have always been associated with masculinity.

### ***Harassment and Pregnancy Challenges Faced When Employing Females***

Whitlock (2002:449) indicated that existing studies refer to numerous harassment manifes-

tations such as threats, demands and even bodily contact. Their male counterparts who use unacceptable language and comments often abuse women in the form of verbal harassment. Campbell (2007) warned that issues that may cause women working underground to leave include the social environment underground, which is hostile to women; fear, or experience of sexual harassment and/or sexual intimidation or assault; the inability to cope with the physical challenges of working underground; and, even if they can cope, finding the physical working environment just too unpleasant.

Conversely, the Basic Conditions of Employment Act 75 of 1997 explicitly forbids employers to make, or allow, a pregnant (or nursing) employee to do work that is hazardous to her health or the health of her child.

McGwin et al. (2002:1306) referred to statistical data released by the Department of Minerals and Energy indicating that more than one hundred miners are killed every year in the South African mining industry. They also indicated that the mining industry has the highest fatality rate per occupation and industry. This is a worrying fact as mining is seen as the backbone of the South African economy. Ranchod (2001: 32) indicated that the industry will face major challenges regarding the integration of women into the underground workings and he warned that specific occupational health and safety requirements will have to be considered by the mining industry with regard to this. Keegan et al. (2001) made it clear that such a reform process must make changing the culture of the industry a priority; however, in doing so, an emphasis must be placed on the number one priority, being the achievement of mining safety milestone targets.

One of the major safety concerns is that of personal protective equipment (PPE). PPE is designed and supplied specifically for the use of the male population (Forastieri 2002). This results in women not being adequately equipped with the right gear and, as such, a higher potential realises for women to be more accident prone. However, in research by Singer (2002: 2), it was found that women are more careful towards unsafe conditions.

Another concern is that of physical hard labour that women have to endure in the mining environment. Physical hard labour could cause lower back pain and it has been found that the effects of lumbar curvature on lower back pain

risk factors during repetitive postural upper extremity musculoskeletal disorders in the neck and upper limbs are common among industrial workers with women specifically being prone to this phenomenon (Arvidsson et al. 2003: 309).

Appel (2009) reported on an audit of the mining industry and the findings of which indicated 66 percent compliance to safety systems compared to the industry in the public domain being perceived as very dangerous with 34 percent non-compliance.

## EMPIRICAL RESEARCH

### Target Population

The target population consisted of employees working at a chrome mine the in North West Province, South Africa.

### Sampling

A sample group of one hundred employees from one company were selected from the mine. Employees were asked to complete a questionnaire about employee commitment during the period of September 2012.

The results were used to make recommendations in order to improve employee commitment at this specific company.

### Statistical Data Analysis

A factor analysis was done on the results obtained from the questionnaires. The data initially suggests that a five-factor solution should be considered. The five factors explain 78.3 percent of total variance, and all eigenvalues are greater than 1. If one groups the attributes into factors by their factor loadings, however, it dissolves into three factors (Table 1).

Although the Cronbach alpha in Factor 1 and Factor 2 was high, the factor loadings of Factor 3, Factor 4 and Factor 5 were not high (Table 2).

The factor analysis was repeated, this time forcing it to extract four and three factors. According to the new factor analysis, all the items under career advancement factored together and the reliability analysis confirmed that these items can be grouped together to form a scale called *attitude towards women* (Cronbach alpha =



**Table 1: Factor loadings for five factors on the different questions**

<i>Attributes</i>	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>	<i>Factor 5</i>
Career tracking	.940				
Woman involvement	.887				
Leadership support	.826				
Management support	.707				
Diversity		-.890			
Transformation		-.877			
Accommodate woman		-.854			
Feel comfortable	.347	-.449			
Program support			.770	-.417	
Importance of woman		-.406	.442		
Pregnant woman	.329		-.438		
Personal protective clothing				-.673	
Harassment		.319		.592	
Gender equality				.389	
Housing of woman					.857
Explained variance	5.602	2.223	1.491	1.389	1.035
Proportion variance explained by factors	37.3%	14.8%	9.9%	9.3%	6.9%
Cumulative proportional variance explained	37.3%	52.2%	62.1%	71.4%	78.3%

**Table 2: Factor loadings for three factors on the different questions**

<i>Attributes</i>	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>
Diversity	.886		-.188
Transformation	.831		
Importance of woman	.701	.152	
Accommodate woman	.651		-.164
Feel comfortable	.541	.164	-.167
Gender equality	.302		
Woman involvement	.207	.834	
Career tracking		.819	
Leadership support		.763	
Program support	.212	.646	.155
Management support		.581	-.534
Pregnant woman			-.677
Housing of woman	-.241	.232	.442
Harassment			.419
Personal protective clothing	-.163	.190	-.195
Explained variance	5.380	1.979	1.301
Proportion variance explained by factors	35.87%	13.195%	11.072%
Cumulative proportional variance explained	35.87%	49.065%	60.137%

0.89). All items under the perceptions of women in mining were grouped together, but also included statements such as: In my organisation, changes have been made to accommodate women – this was named transformation and diversity (Cronbach alpha = 0.84). For Factor 3, the scale was found to be unreliable with a Cronbach alpha value = 0.38 (Table 3). This tells us that statements such as those on harassment and housing will have to be analysed individually when doing t-tests, ANOVAs and correlations.

According to the p-values, it is evident that transformation and diversity have a small effect ( $p=0$ ) when it comes to age. Attitude towards

women has a slightly higher effect ( $p=0.17$ ) than transformation when it comes to age (Fig. 1).

Half of the respondents (50%) agreed that my manager supports women in our department. Twenty-six percent (26%) strongly agreed with this statement. This shows a good attitude from

**Table 3: Cronbach's alpha values of the factors**

	<i>Items</i>	<i>Cronbach alpha</i>	<i>Average inter-item correlation</i>
Factor 1	6	0.839	0.459
Factor 2	5	0.890	0.629
Factor 3	4	0.380	0.131

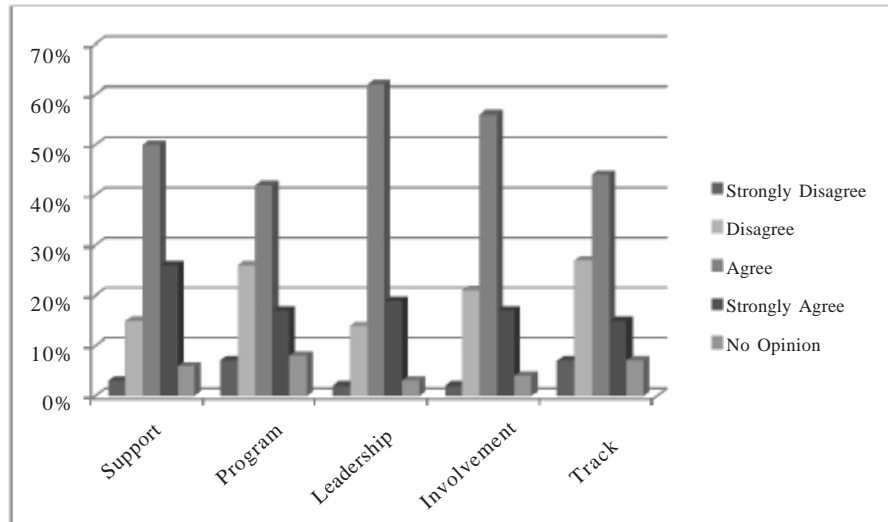


Fig. 1. Attitude towards woman

management towards women. Forty-two percent agreed that there are programmes that address the skills gap between women and men. Sixty-two percent of respondents agreed that my organisation supports leadership and the acquisition of new skills irrespective of gender. From this result, it becomes clear that women are able to advance in the company. Fifty-six percent (56%) of respondents agreed with the statement that in my organisation leadership involves women employees in decision-making, which confirms that the company has a high regard for the views of women in the company. Forty-four percent (44%) of respondents agreed that their managers keep track of women’s career progression.

**CONCLUSION**

From the data that were received, certain findings can be concluded. The age of respondents was relatively young, with 75 percent under the age of 40. This will have an effect on the results that are obtained, because the younger age group tends to be more acceptable to women in the workplace and also to changes in the workplace.

Sixty-one percent of the respondents were male, which corresponds with the literature study, which reveals there is a shortage of women in the mining sector. The fact that there are fewer women in the study will have a major im-

pact, because the study is focused on the perception that exists towards women in mining activities.

It is clear from the responses of participants that transformation plays a large role in the company, with 64 percent of respondents agreeing that it is top of the agenda. This might be because the Mining Charter has very specific targets that must be met. The results also show that employees are encouraged to embrace diversity. With regard to the question whether there are equal numbers of women and men, it shows that there are fewer women than men. This result confirms what is stated in the literature study. Out of the participants, 82 percent felt comfortable in the organisation. This is a very good sign for any company, especially for a mining company that is faced with difficult challenges regarding women.

Seventy-six percent of respondents agreed that their managers support women in their department. Management has a big responsibility to lead by example. By showing workers that they support women, they are changing the attitudes of workers towards women. From the data, the researchers can ascertain that there are programmes to address the skills gap between men and women; managers also keep track of women’s career progression. Probably the best results that are obtained from the study are that in this company women are able to advance and

that they are involved in decision-making. By including women in all facets of the company, the attitude towards women will be changed.

Four questions were analysed individually, because they could not be grouped together and because they contain important information. These four questions are some of the most challenging that exist in the mining workplace at the moment and have a major impact on the attitude towards women and the rate of transformation. Sexual harassment is a major problem that women in the mining sector have to cope with. There are a small number of participants who agreed to having been sexually or physically harassed. From the literature study, the researchers anticipated a higher incident, but this figure still shows that the company definitely also deals with the same problem. Another big issue that women in mining encounter is that of personal protective equipment. Over the years, personal protective equipment was made only for men and only with the specific dimensions of men in mind; however, with women starting to work in mines, it can be seen that this is a problem. Clothing specifically designed for women will have to be investigated. Pregnant women will always be a topic while women work in mines. Pregnant women must work in non-hazardous conditions. This forces the company to move these women to different sections.

### RECOMMENDATIONS

The following recommendations can be made from the survey results:

- ♦ Programmes will have to be implemented to address the perception of the male workers that women do not belong in an underground mine, as there are still certain issues such as culture and workplace environment that need special attention.
- ♦ Workers will have to be informed and trained on the sexual harassment policy of the mine.
- ♦ The company will have to look into specific health and safety issues pertaining to women, such as personal protective equipment and housing.
- ♦ The company must make sure that women who are fast-tracked are specifically looked after and that management is aware of their progress at all times.

- ♦ The company will have to make sure that gender equality remains a priority, as this can have a major influence on the progress that has already been made.
- ♦ Employees must be promoted within the ranks on an equal basis and on ability.

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