

# MONGOLIA: RAISING FEMALE PARTICIPATION IN THE LARGE SCALE MINING SECTOR



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# INTRODUCTION

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AsAs Монголиа has begun to develop its abundant mineral resources over the past decade, the share of mining in GDP has more than tripled to around 20 percent currently. The sector has also contributed up to a third of total government receipts in recent years and more than 80 percent of exports in 2010. With one large-scale copper-gold mining project (Oyu Tolgoi) expected to come onstream in 2013 and several other large projects in the pipeline, the economy's dependence on the mineral sector will only grow in the coming years.

Evidence suggests that women tend to miss out on the potential benefits associated with a booming mining sector<sup>1</sup>. For example, data from mining companies worldwide shows that only 5-10 percent of the extractive industry workforce tends to be female, typically in service support roles, while the bulk of risks relating to health, social and family disruptions also tended to be borne by women<sup>2</sup>. In addition, large scale mines typically tend to be the dominant employers in remote locations. But as a study of the coal mining industry in Indonesia finds, when large-scale mining is combined with an overwhelmingly male workforce, there can be profound effects on gender relations with women being forced to depend on men for their economic survival, either as wives or prostitutes.<sup>3</sup>

The development case for greater involvement of women in minerals and related sectors is straightforward. Women constitute half of society and therefore should share equally the benefits from mining and not bear a greater burden than men from the risks of mining<sup>4</sup>. The business case is to develop a culture of equity and diversity in the

workplace, drawing upon a broad pool of labor in what has traditionally been and still is a male dominated industry. By overlooking women who are as productive and effective as men, extractive industry companies drive up labor costs for what may already be a very small pool of skilled workers. Recruiting workers from overseas is an option but tapping a domestic pool of labor (women) is likely to be a politically and economically more palatable/cost effective solution.<sup>5</sup> Other potential benefits include evidence from Chile, Zambia and Papua New Guinea that operating and maintenance costs for mining and related heavy equipment are lower when these are operated by women, increasing their lifespan and bringing cost savings to firms<sup>6</sup>. That said, it is important that a “women are safer” or “take fewer risks” approach does not reinforce occupational segregation and gender stereotyping.

These issues are even more timely in Mongolia given that several large scale mines are expected to be developed in the near future. Currently the formal mining sector in Mongolia employs roughly 40,000 people<sup>7</sup> or about 4 percent of total employment (Figure 1).<sup>8</sup> Although mining tends to be capital intensive, its expansion should nevertheless generate significant employment opportunities. Moreover, as it scales up, there should be direct knock-on effects on other sectors, such as transport, utilities and construction which

1 Eftimie, Heller and Strongman (2009)

2 For an excellent review of these see Eftimie, Heller and Strongman (2009)

3 Lahiri-Dutt and Mahy (2006)

4 Strongman, J. (2008) Gender mainstreaming in the mining sector and mining communities. Another argument is that while men tend to use their income on the gratification of their immediate consumption needs, women tend to save more of their money or spend it on their dependents, health, education, etc.

5 Mining companies worldwide are currently struggling to meet rapidly growing global demand for iron, copper and other essential commodities and skilled labour shortages are a key constraint. In Australia, looming skill shortages – an estimated 86,000 workers are needed this decade on top of the 200,000 that the industry already hires – are leading to a rethink of industry and government policy towards women and indigenous minorities. For example, see <http://www.e-mj.com/index.php/features/461-australian-mining-industrys-looming-labor-shortage.html>

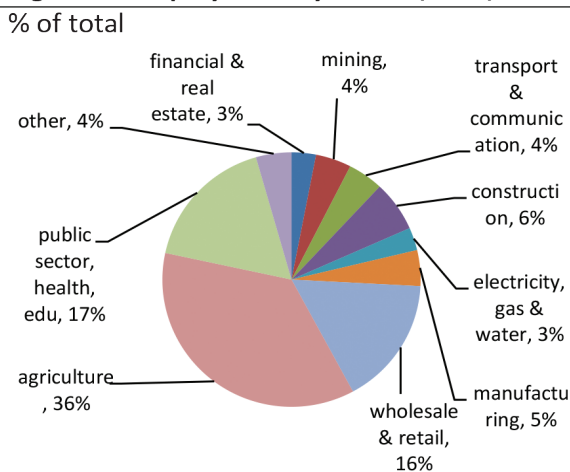
6 IFC (2006) “Promoting gender equality in the private sector – hiring women in mining production jobs”

7 Rising to nearly 47,000 in 2008 before the drop in global commodity prices led to a deep economic downturn and a sharp rise in unemployment.

8 Although it is estimated that the actual figure as high as 100,000 once seasonally driven artisanal mining is also taken into account, see ILO (2006).

currently account for another 13 percent of total employment. However, there has been little discussion of large scale mining in Mongolia from a gender perspective, although small-scale or artisanal mining and its gender related impacts have received growing attention in recent years<sup>9</sup>.

**Figure 1. Employment by sector (2008)**



Source: NSO

Accordingly the objective of this note is to identify strategies, policies and practices to help improve women’s access and participation in mining. The policy note starts by gauging potential growth and employment effects associated with the expansion of the mining sector on other sectors, using a computable general equilibrium model specially calibrated for the Mongolian economy. It then considers experience and lessons from other countries that are trying to integrate and ensure the participation of women in large-scale mining and the practical policy recommendations to do so.

The key findings are that there is a high degree of occupational segmentation in the mining sector, with women mostly located in service support roles, although this is by no means unique to Mongolia. However in Mongolia’s case, this segmentation also likely reflects Mongolian labor regulations that existed until 2008 and which limited women’s participation in the sector. The impact of these regulations is likely to have been further compounded by gender stereotyping and cultural norms which encourage women

<sup>9</sup> E.g. ILO (2006), and World Bank (2012)

towards “easier jobs” and a male-dominated mining industry culture where discrimination and harassment against women is rife.<sup>10</sup> It is worth nothing that although there are fewer female than male graduates with natural science and technology degrees in Mongolia, their numbers are not small: of the 5800 or so students with such degrees that graduated in 2009/10, some 2300 were women suggesting that there are two problems with female employment in the mining sector in Mongolia: firstly that there are insufficient women with the requisite technical skills, and secondly, those that do possess these skills, do not get hired or choose to self-select out of mining sector jobs.

Evidence from around the world indicates that gender equal laws are a necessary and crucial first step towards guaranteeing gender equality and equity, *but by themselves are not sufficient*. Instead the government also needs to introduce policies that promote gender equity e.g. through affirmative action policies in the mining sector as well as regulations that ensure the health and safety of both men and women. Meanwhile laws against sexual harassment which tends to be widespread in mining and associated sectors also need to be enforced.

In addition, the mining sector in Mongolia is already experiencing a shortage of skilled professionals, and given the scale of expansion expected over the medium to longer term, the paucity of skilled workers is likely to grow even more acute. Government intervention, coordinated with industry and aimed at vocational and technical training can help to ensure that women are able to shift from service support roles to the professional mining (and related industry) stream, helping to overcome this shortage.

Furthermore, female participation in the mining sector concerns not only women as workers, *but also women as owners*. Given that women tend to have smaller business networks

<sup>10</sup> As elsewhere in the world, extractive industries and related sectors tend to be heavily male dominated, and a combination of discrimination and self-selection by women – mining is seen as a “tough job,” takes place in remote areas where family relationships are hard to maintain, support services are inadequate and women may feel socially isolated – can all operate to reduce women’s participation even further.

than men, policy actions such as ensuring that the award of mining licenses is transparent will go a long way towards providing a level playing field for women. Other measures that can help include the provision of micro credit and business training to women entrepreneurs who are local suppliers to mining firms<sup>11</sup>. The government can also mandate the reporting of how companies (and not just in the mining sector) are applying equal opportunity policies. A summary of the policy actions suggested and the implementing agencies is set out in Table 1 below.

Finally, institutional reforms are needed at the industry level to ensure that women are fully able to participate in the mining sector. An example of how this has been successfully done by one of

<sup>11</sup> Local supply companies employ substantial numbers of people and their importance should not be overlooked. The catering company which supplies the Oyu Tolgoi mine for example employs some 4000 workers, nearly three quarters of which are women.

the world's largest platinum producers located in South Africa is provided in Box 1. Such measures will prove extremely important in encouraging women to invest in technical and mining related education, to apply to mining sector jobs and to continue working in the mining sector. Mining firms will accordingly need to make firm commitments, reinforced by clear incentives and targets with clearly stated consequences in case of failure to progress, to diversify their workforce. This needs to be accompanied by a review and understanding of where women are located in the work force, what their key concerns are and whether existing infrastructure support female workers (e.g. separate accommodation and toilet facilities, child care facilities, flexible work policies). Companies may also consider revising recruitment/hiring strategies with the objective of raising the share of female employment across all professional categories in the mining sector.

**Table 1: Suggested Policy Actions and Implementing Agencies**

Key Policy Actions	Implementing Agencies/Partners
<i><b>Broad policy actions</b></i>	
<p><b>Implement the Law on Gender Equality passed in February 2011.</b> The law sets out the responsibilities of public agencies including through affirmative action and mandates the establishment of a complaint mechanism through the National Human Rights Commission and employment dispute commissions.</p>	<p>The main implementing agency is the <b>National Committee on Gender Equality (NCGE)</b>, supported by all organs of government to ensure that there is adequate representation of women in all spheres of government and that the minimum ceilings for female employment in the public sector set out in the Law on Gender Equality are adhered to. Partners: <b>ADB, World Bank, other international donors and national and international agencies</b></p>
<p><b>Create opportunities for work for women in the mining and related growth industries through appropriate technical and vocational skills programs, technical and scientific education and small business training</b></p>	<p><b>Ministry of Social Welfare and Labor, Ministry of Mineral Resources and Energy and Ministry of Education</b> will need to coordinate with each other, with mining companies and with local (and possibly international) higher education institutions to assess particular skills required and how to provide training on those skills. Currently there are high levels of occupational segregation by gender in the mining workforce, with women working mainly in service support roles (catering, laundry, cleaning). The government could set up appropriate technical, vocational and business education programs that provide the skills for women to enter mining related career streams, both as employees as well as owners/managers of supplier businesses. The government could also support mining companies in setting up work-training or internship programs for female students</p>
<p><b>Address sexual harassment in the work place, which also tends to be problematic in mining industries.</b></p>	<p><b>NCGE / Ministry of Social Welfare and Labor and NGOs.</b> The newly passed law on gender equality contains provisions including establishing internal procedures for its prevention as well as a complaint mechanism. Adherence to these by the public and private sector need to be carefully monitored. The NCGE could also set up a small “legal cell” which provides legal, financial and informational assistance to women subject to sexual harassment. The government could introduce informational awareness campaigns on various electronic and print media. Annual campaigns of “best companies to work for” could also help pressure companies to improve their working environment.</p>



Encourage the presence of women not just as workers but also as owners in the mining and related sector.

**Ministry of Mineral Resources and Energy** could ensure greater transparency in award of mining contracts and openness in bids, which would encourage women to compete on a level playing ground for lucrative mining contracts. In addition, the **Ministry of Social Welfare and Labor** and **Ministry of Finance** could coordinate to provide small business training to women and access to SME finance. This would increase women's presence in supplier businesses (to the mining sector).

Introduce decrees that promote affirmative action in the mining sector where female under representation is particularly acute.

**Ministry of Social Welfare and Labor /Ministry of Mineral Resources and Energy.** Following the example of South Africa (see Box 1), the government could mandate that a certain percentage of the workforce in mining, where women are acutely under-represented, are female within a specific time frame (say 5 years). This would complement other programs that equip women with the necessary technical and vocational skills to work in the mining sector (see section above).

Introduce best practice recommendations on how to incorporate equal opportunities in the mining sector and require companies to either comply with or explain why they are not doing so ("light touch regulation").

**Ministry of Mineral Resources and Energy** in partnership with **NGOs** and/or **international agencies, trade unions** and **company and workers representatives.**

Assess health and physical needs and safety to improve working conditions for both men and women in the mining industry. In the case of women, this also requires assessing whether the right facilities and services are in place to help them integrate better into the workforce (e.g. separate and secure living condition, change and toilet facilities etc)

**Ministry of Social Welfare and Labor supported by NGOs and/or international agencies** (e.g the IFC) and in consultation with employers, trade unions and workers.

# BACKGROUND AND CONTEXT

Mongolia has some of the world's largest untapped mineral deposits, including copper, uranium, coal and gold. Close proximity to fast-growing China, which for example is estimated to have imported 165 million tons of coal in 2010 up from 103 million tons a year earlier,<sup>12</sup> means that there is a ready market for these commodities.

It is estimated that Southern Mongolia alone has the potential to produce more than 45 million tons of coal per year (Table 2) generating revenues of \$5bn or more a year<sup>13</sup>. Oyu Tolgoi (OT), which is the world's largest undeveloped gold-copper project and which is located just north of the Chinese border, is currently under construction, and is expected to produce from 2013 onwards some 500,000 tonnes of copper and 500,000 ounces of gold per year for at least 35 years. It is widely expected that the government will allow other mines to expand or begin operations as well including Tavan Tolgoi which is believed to be one of the largest untapped coal deposits in the world, and, once developed is expected to produce 15mn tons a year.<sup>14</sup>

As a result, the economy is expected to experience significant structural changes as its dependence on the mineral sector grows. The development of the OT mine alone is expected to result in more than a quadrupling of GDP within a few years when production begins in 2013 (Figure 2). While medium to long term projections are subject to uncertainty, the share of the mineral sector in overall GDP is expected to rise from about one-fifth currently to more than one-half by 2016 simply as a result of the OT mine becoming operational. If over the medium term, other mines

are developed as well, then the mining sector share of GDP will rise even further.

In addition, significant investment is required to get Mongolia's mineral resources out of the ground and to market. Accordingly, large multiplier effects on other sectors directly related to mining, particularly infrastructure, transport and utilities are expected. For example, an estimated US\$5bn is required in the Southern Mongolia region by 2015 for investment in railways, electricity, towns, and water.<sup>15</sup> The largest investment needs are in electricity generation (about US\$2.7bn) to meet the energy needs of the population and mining projects. Considerable investment in railways and road transportation links (of up to US\$1.1bn) is also needed. Meanwhile, some US\$1.4 bn is required for urban development around mining centers to house workers and their families as well as associated service providers. For every mining job created, there may be 2 - 4 additional jobs generated indirectly among local suppliers such as catering, laundry, clothing and uniform supply, clerical support and so on.<sup>16</sup>

But increasing natural resource specialization will also affect other sectors aside from those directly related to mining and these impacts may not be all positive. Typically a mining boom or windfall carries the risk of Dutch Disease. This occurs when large commodity rents associated with a boom in mining exports cause the exchange rate to appreciate and/or push up domestic inflation. With the tradable sector (typically manufacturing, but also other sectors such as agriculture or firms exposed to import competition) unable to raise its prices in response to rising domestic input prices its competitiveness and profitability is undermined and it contracts while the non-

12 <http://www.mineweb.com/mineweb/view/mineweb/en/page38?oid=120867&sn=Detail>. It has previously been reported that China is building up to two coal fired power plants a week. <http://news.bbc.co.uk/2/hi/asia-pacific/6769743.stm>

13 World Bank (2009)

14 The Tavan Tolgoi coking and thermal coal deposit for instance, for which the government is currently is seeking contract mining agreements to develop the deposit, holds about 6 – 6.5 billion tones in reserves, thus making it one of the largest unexploited fuel reserves in the world.

15 World Bank (2009)

16 Eftimie, Heller and Strongman (2009). Multipliers associated with an expansion in mining output can be quite large. For instance it has been estimated that output multipliers associated with the mining industry in southern Australia are in the region of 2, income multipliers are 3 and employment multipliers are as high as 4.

traded sectors (services) expand. Accordingly an expansion in mining and associated industries may aid the expansion of some sectors, but also

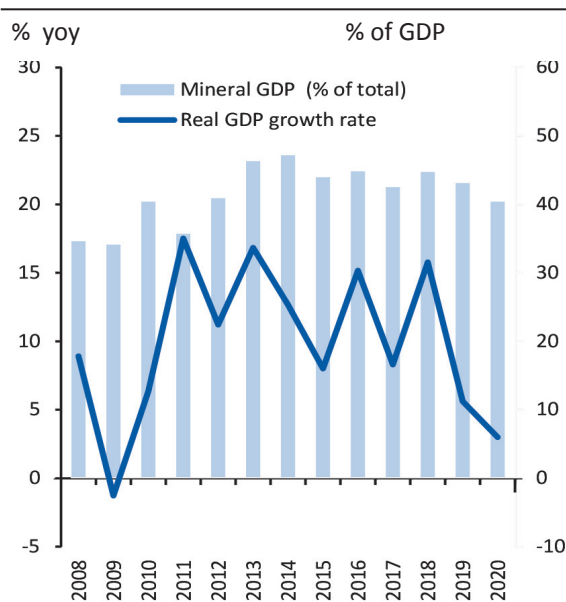
the contraction of others such as agriculture or manufacturing that are hit by Dutch Disease.

**Table 2. Potential Major Mines in Southern Mongolia**

Mine	Mineral	Life (years)	Production (000, tons/year)
Tavan Tolgoi	Coal	200+	15,000
Uhaahudag	Coal	40	10,000
Baruun Naran	Coal	20	6,000
Tsagaan Tolgoi	Coal	20	2,000
Nariin Sukhait	Coal	40	12,000
Ovoot Tolgoi	Coal	50	5,000
Sumber	Coal	50	5,000
Shiveer Ovoo	Coal	200+	14,000
Oyu Tolgoi*	Copper	50	2,000
Tsagaan Suvraga*	Copper	20	250

Source: Southern Mongolia Infrastructure Strategy (2009). \* Production figure is for copper concentrate (30 percent copper)

**Figure 2. Projected impact of OT mine on GDP growth**



Source: IMF, WB. Notes: The chart shows the impact of OT coming onstream, and GDP growth may stay high beyond 2018 if other major mines are also able to expand output.

# POTENTIAL GROWTH AND EMPLOYMENT IMPACTS ASSOCIATED WITH AN EXPANSION OF THE MINING SECTOR

To explore the potential growth and employment impacts associated with the upcoming mining boom a multi-sector computable general equilibrium model specially calibrated to the Mongolian economy is employed. The analysis uses the World Bank's MAMS (Maquette for MDG Simulation)<sup>17</sup>, which provides a general framework for economy-wide country-level medium to long run analysis. However given data constraints, the MAMS model for Mongolia (as indeed any CGE model for any economy) should be seen as providing a general approximation of the economy and the simulations as indicating the broad magnitudes and directions of change.

The simulations assume that mining sector output doubles between 2012 and 2014. The results are compared to a baseline in which the mining sector continues to grow at the same rate as the overall economy, assumed to be 6.5 percent over the long run. The resulting surge in mining sector exports requires, for equilibrium to be regained and the current account to balance over the medium to long-term, imports to expand and/or other non-mining exports to decrease. In part this is achieved by a nominal appreciation of the exchange rate which hurts the competitiveness and profitability of the traded sectors (Figure 3).

However a real exchange rate appreciation is also an important part of the adjustment mechanism. This is primarily driven by a reallocation of the relatively scarce labour factor to the mining sector which pushes up economy-wide wages. In turn, this also undermines profitability in the traded sector and agriculture, which contract (and Figure 4) releasing factors to

construction, the private non-traded sector and government sector which expands in line with rising mineral sector tax revenues. The extent to which employment expands/contracts by depends upon the intensity of factor use, the degree of substitutability between different types of factor inputs and the relative increase in factor prices. For instance, as agriculture and manufacturing shed jobs, these are more readily absorbed by the service sector which is labor intensive and where the opportunity to switch to labor-saving technologies may be more limited (Figure 5).

The simulations suggest that the expansion of the mining sector could add some 5000 jobs annually (Figure 6) between 2012 and 2014 (or some 15,000 jobs). But it is important to emphasize that these are broad indicators of the extent to which employment could expand.<sup>18</sup> A lower bound (and one that is more plausible) is provided by the Southern Mongolia Infrastructure Strategy Report (2009) according to which the development of mines in Southern Mongolia could generate an additional 10,000 or so jobs in the near to medium term with further jobs likely if mines in other parts of the country are also developed. Additional jobs in mining related sectors – construction, catering and other local companies that supply the mines – are also likely to be substantial<sup>19</sup> and similar in number to those created directly within mining.

17 See Löfgren, Lee and Robinson (2001) and Löfgren and Díaz-Bonilla (2006) for a description of the basic features of a MAMS model.

18 The MAMS model assumes that labour is used in fixed proportion to other factors in the mining sector. Accordingly, as the mining sector doubles in size so do its labour needs. However the production technology in the other sectors assumes that profit-maximizing producers choose factor input ratios including labour on the basis of relative factor costs that minimize production costs (or maximize profits).

19 As noted above, employment multipliers can be fairly large for these related sectors

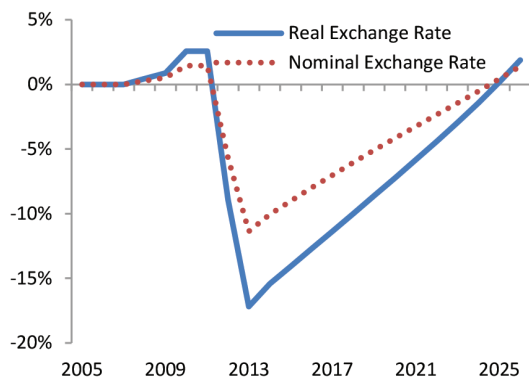
Most mining jobs, as well those in other high growth sectors such as construction, will likely accrue to men. In part this reflects legal and other impediments to women regarding work in extractive and related industries in Mongolia (for example women are not allowed to work in underground mining or drive trucks above a certain haulage as discussed in the next section), but also industry cultural factors that discourage women from working in mining. Offsetting this, employment will expand in sectors where women's economic participation is already relatively high e.g. the private non-tradable sector and the public sector (Figure 7).

However it is worth noting that irrespective of which sector they are located in, large gaps in what women and men earn (Figure 8). For example, women were paid 23 percent less than men in mining and 17 percent less on average and nearly a third less in community and social services where female participation is relatively high. In addition, as documented in the companion policy note on labor markets in Mongolia,<sup>20</sup> women are located mostly in informal sector wage employment in the service sector, heavily concentrated in support positions in retail and catering.

20 Gender disparities in Mongolian labor markets and policy suggestions (2011), World Bank, forthcoming.

**Figure 3. Scaling up of mineral output: exchange rate movements**

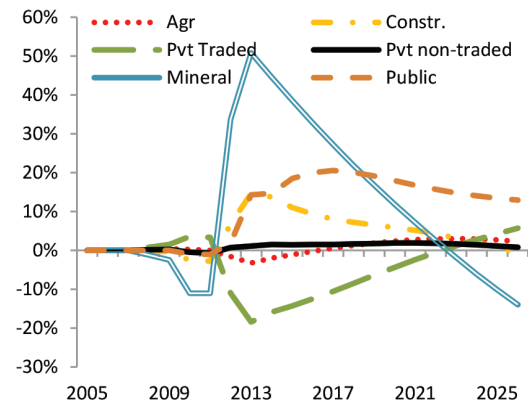
Difference to Baseline in % (+ is a depreciation)



Source: World Bank

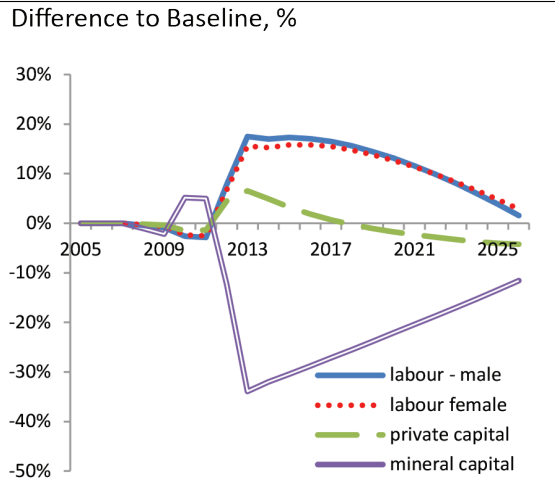
**Scaling up of mineral output: real value added by sector**

Difference to Baseline in %



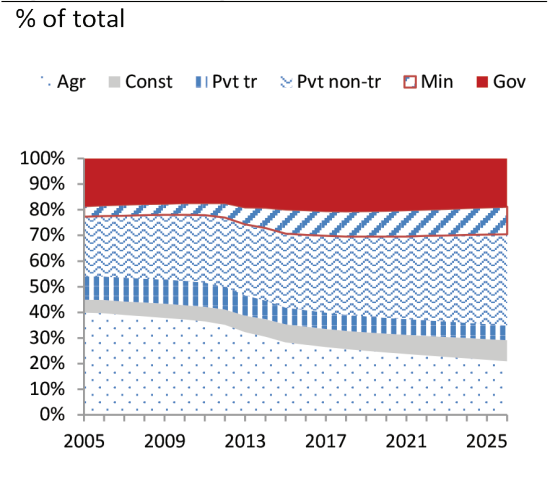
Source: World Bank

**Figure 4 : Average economy wide rents by factor**



Source: World Bank

**Figure 5 : Employment by sector after scaling up of mineral output**



Source: World Bank<sup>21</sup>

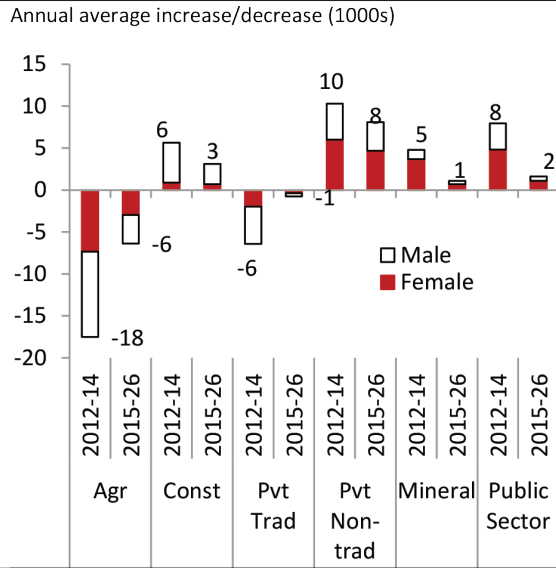
Moreover, there is unlikely to be a seamless shift of workers out of contracting sectors into those that are expanding as assumed in the MAMS model. Large job losses e.g. in the low-skill agricultural sector which accounts for more than a third of total employment (refer back to Figure 1) are unlikely to be mopped up completely by the mining sector. Neither is it clear how the private non-tradable sector will mop up the influx of low-skilled workers from agriculture. Instead, what is most likely is skill shortages in some sectors (mining, financial services) and unemployment in others (agriculture and retail). Alternatively depending on policy actions, the results could be very different. For example if all the mining export revenue is saved overseas in a sovereign wealth fund, or if the government makes an effort

to constrain government spending as the economy grows helping to minimize appreciation pressures, then the Dutch Disease effects could be much smaller<sup>22</sup>.

<sup>21</sup> Labor supply is exogenously determined by population growth within MAMS. Accordingly these charts simply depict a reallocation of factor inputs from one sector to another in response to wage movements and given elasticity of substitution between factor inputs.

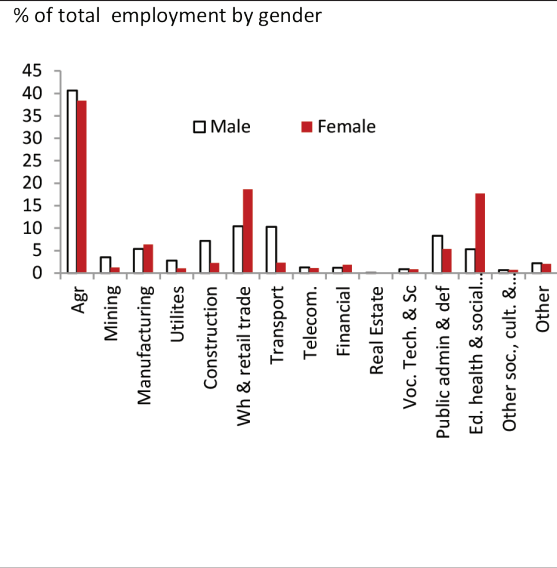
<sup>22</sup> The impact of different government policies in minimizing Dutch Disease effects is being explored in a separate World-Bank and IMF study.

**Figure 6. Employment gains/losses by sector and gender**



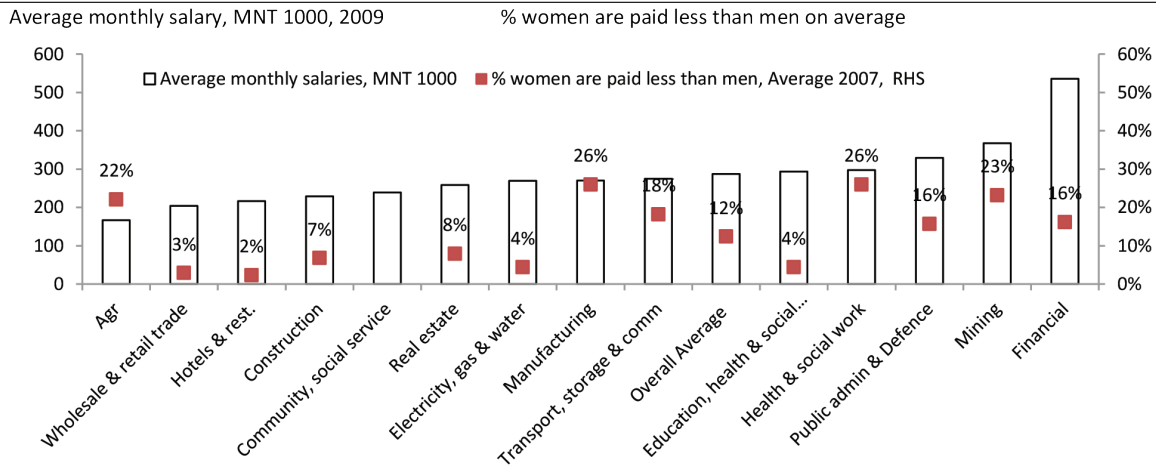
Source: World Bank (2010). Figures in labels are total employment gains/losses by sector (average per year)

**Figure 7 Actual employment by gender and sector, 2008-09**



Source: LFS 2008-09 Survey

**Figure 8 Average wages by sector and wage gaps between men and women**



Notes. Data labels indicate the percentage amount that women are paid less than men on average in a particular sector. Source: NSO 2009 Statistical Yearbook and ADB (2010)



# IMPEDIMENTS TO FEMALE PARTICIPATION IN MINING AND RELATED INDUSTRIES IN MONGOLIA

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Low female participation in the extractive industry and related sectors is the outcome of several factors. On the one hand, extensive legislative impediments mean that women have far fewer opportunities in these sectors. On the other, the absence of affirmative action policies in combination with discrimination may also play a role and may also encourage women to choose other occupations.

Mongolia is a signatory to core international human rights instruments and treaties relating to women, including the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW) and also has a relatively strong legislative framework including the Family Law, a Law on Social Welfare, Law on Domestic Violence and a Labor Code that aim to prevent any discrimination or violation of human rights, including women's rights. More recently the country also passed a Law on Gender Equality. This is an important first step in a country which previously lacked any specific national law on gender equality, and particularly because it spells out responsibilities of specific public agencies to ensure gender equality.

However labor regulations that were in place until 2008, and gender stereotyping are together likely to have played an important role in reducing women's participation in the mining sector. The labor regulations prohibited women from participating in a wide range of activities (Appendix B). Although formally not "law" they were legally binding as they were effectively a regulation authorized by the law. The prohibited activities included "all kinds of underground work" in the mining industry, irrespective of whether or not these were safe, involved hard physical labor, were mechanized or not and irrespective of the

nature of work (e.g. as geologists, engineers, or mine surveyors). They also prohibited women from working in crushing and in using certain machine tools in construction, restricted employment in transportation including driving vehicles that had more than 2.5 tons of carrying capacity or 25 passengers or more, and other types of work in the utilities sector. The main objective of these restrictions was to address health and safety concerns, but their extensive nature prevented women from undertaking jobs that are deemed "safe" in other countries. For example, the list covered industries such as meatpacking, textile, tailoring and publishing, where such health and safety concerns may be quite small. In addition, health and safety concerns could arguably have been more directly addressed, to the benefit of both men and women, rather than through exclusionary labor regulations

Gender stereotyping is also important in Mongolia, with anecdotal evidence suggesting that women are not encouraged to enter jobs that are deemed "unsuitable and unsafe" and that women should be protected from "hard jobs." Case study and interview evidence also points to sexual discrimination as an important factor restricting women's entry into mining. For instance, an ILO study documented that although domestic mining companies did not explicitly discriminate against female geology students when requesting recommendations for hiring from the Mongolian University of Science and Technology (MUST) student body, nevertheless they preferred male employees (ILO, 2006). As a result, even though women comprise half of all geology graduates, they amounted to only 10 percent of mining sector employees. In addition, most female employees worked in service support



roles such as cooks, cleaners, brick-makers, or tended livestock and vegetable patches for the companies.

The ILO study also interviewed women employees in a number of companies in the formal mining sector and documented sexual harassment and a lack of gender-sensitive company policies with respect to living and working conditions. For example, women working in both service support and professional roles reported harassment and disrespectful treatments<sup>23</sup> and there was a

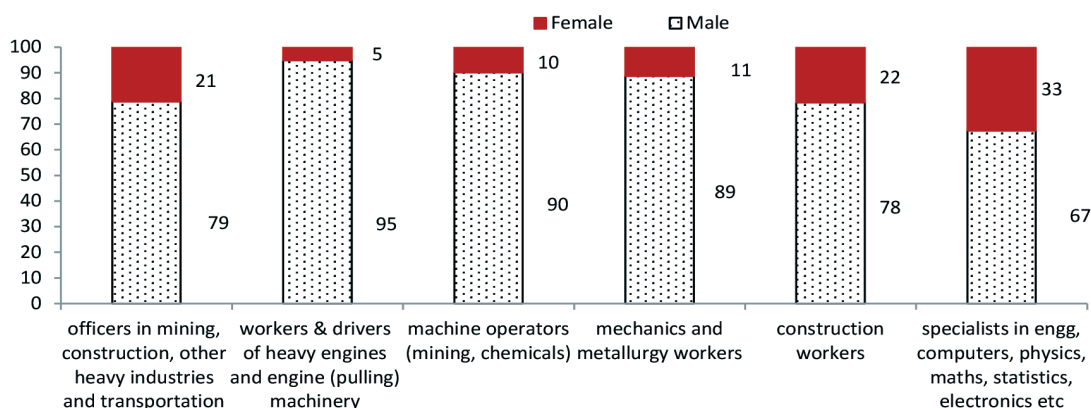
reluctance to register any complaints because such behavior was considered the norm. In addition, there was limited support provided for women with families with some mining companies requiring women to live at the mine and charging a fairly high daily fee if their families wanted to stay over. Others interview respondents reported having to share living quarters/accommodation with men, tough working conditions that included exposure to chemicals and high temperatures.

23 “The women working at Mongolgarzar, the much larger mining company located in Omnogov province... complained of disrespectful treatment and harassment from the male mine workers and security guards, being unreasonably overworked by their supervisors and enduring forced separations from their

children and families. They alleged that the male workers called them “local Indians,” a derogatory phrase, and were arrogant – sometimes subjecting them to humiliating experiences” (ILO, 2006)

**Figure 9. Occupational segmentation in mining, engineering, construction, and other related industries**

% of total employment by occupation and gender



Source: HIES 2007-08 survey

The upshot is that there is considerable occupational segmentation in mining and associated industries. For instance, only 5 percent of all employees working as “drivers of heavy engines and engine (pulling) machinery,” are women (Figure 10). The corresponding figures for machine operators and mechanics in mining and chemicals, and for officers in mining, construction, transportation and other heavy industries are 10 and 11 percent respectively (2007-08 Household Income and Expenditure Survey). Meanwhile the ADB (2010) documents that women comprise

only 16 percent of the National University’s School of Mining graduates<sup>24</sup>, reflecting their limited employment opportunities and their occupational choices. And, of the 5800 or so students that graduated with natural science and technology degrees in 2009/10, 40 percent were women compared with 70 percent of the 22,000 social science, humanities and education graduates.<sup>25</sup>

24 Student Statistics of the School of Mining, 2009-2010 academic year. Women constitute 22% of Master’s degree students and 39% of Doctor’s degree.

25 NSO (2010).

# FEMALE PARTICIPATION IN THE MINING SECTOR IN OTHER COUNTRIES

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Gender Gender unfriendly company policies, sexual discrimination and harassment are not unique to Mongolia's extractive industry. However, there are concerted efforts being made to document and improve the working conditions of women, to better integrate them into the mining workforce in both developed and developing countries. *This is being driven by the mining industry itself* to address acute skills shortages that are harming corporate profitability otherwise.

The first (and crucial step) taken in Australia and Canada for instance, is that the mining industry in conjunction with academia and the government has undertaken audits and surveys of what factors affect female participation in the mining sector, and how to retain and attract female staff.<sup>26</sup>

What these surveys from developed countries show that despite the presence of gender equal laws, the mining sector workforce is overwhelmingly dominated by males and that the work culture and gender unfriendly policies followed by firms are important reasons why the sector was both unable to attract and to retain women workers.

Canada for example, has some 840 mines and some 1400 mining companies listed on the Toronto Stock Exchange and its mining and exploration sector hires some 150,000 workers directly<sup>27</sup>. Although the representation of woman in mining and exploration has risen from less than 11 percent in 1996 to 14 percent in 2006 (Figure 10), it is much lower than their participation in the overall workforce at 47 percent.<sup>28</sup>

Labor force statistics are similar in Australia, where the mining sector hires some 120,000 employees fulltime, of which some 13 percent are women. In addition, surveys show that women are heavily concentrated in support, clerical or administrative roles and there are large pay gaps within mining occupations that cannot be explained by differences in the number of hours worked by men and women. Moreover even in occupations where women are well-represented, they do not hold a proportionate number of managerial positions (Figure 11).<sup>29</sup>

Generally, surveys from both Australia and Canada document that the mining culture and working conditions are heavily skewed against women. This was despite the fact that women were experienced, willing and prepared to participate fully in the whole range of jobs and occupational roles available in the sector, including as heavy equipment operators and in remote exploration camps<sup>30</sup>.

In both countries women identify a "male dominated work culture" as a key challenge for a successful career at every stage<sup>31</sup> and also reported discrimination against women as a "serious and systemic issue"<sup>32</sup>. Although serious sexual harassment was not identified as a major complaint, nevertheless "moderate levels of sexual harassment and bullying, such as inappropriate comments and displays of sexually offensive material" were accepted at mine sites and women were typically reluctant to formalize complaints of harassment and discrimination.<sup>33</sup>

26 For example, see the Office for Women and Minerals Council of Australia Report (2007) and the WIM (2010) survey of women in the Canada's mining industry.

27 If workers in mineral and metal manufacturing sectors are included, the number rises to 350,000 or about 2 percent of the workforce.

28 WIM (2010) survey of women in the Canada's mining industry.

29 Office for Women and Minerals Council of Australia Report (2007)

30 WIM (2010) survey of women in the Canada's mining industry.

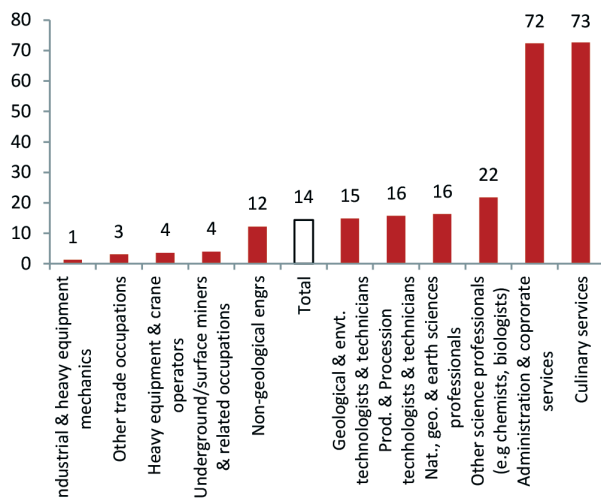
31 WIM (2010) survey of women in the Canada's mining industry.

32 Office for Women and Minerals Council of Australia Report (2007)

33 Office for Women and Minerals Council of Australia Report (2007)

**Figure 10. Occupational segmentation in mining and exploration sector in Canada, 2006**

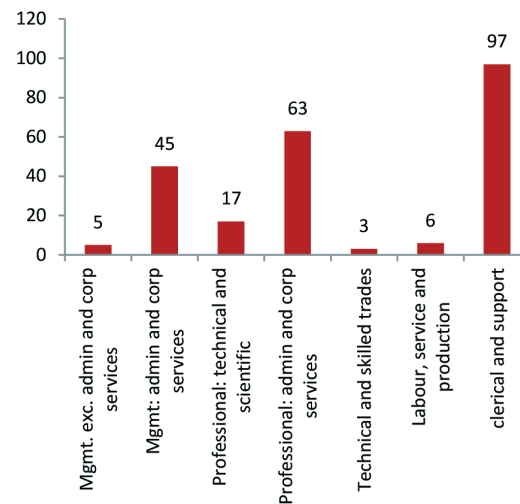
Female employment as % of total employment in sector



Source: WIM Canada (2010)

**Figure 11. Representation of women in managerial positions in Canadian mining sector, 2006**

% of total employment by gender



Source: WIM Canada (2010)


In addition, women were likely to experience social and professional isolation because of the relatively few number of women working in the industry. The surveys show that with men recruiting “in their own image” and most supervisory and managerial positions held by males, women had relatively few mentors or role models to look up to. Meanwhile working conditions resulted in difficulties in retaining female staff, for example due to a lack of suitable child care facilities, long working hours, unattractive shifts and extended periods of travel to mine sites<sup>34</sup>. Even where flexible work programs were available, the work culture was not regarded as being supportive of workers accessing these programs. These factors also played an important role in career choices made by female students with many viewing mining as a tough industry to work in. Care issues and the lack of support were particularly important, with women disengaging from the workforce in the absence of support regarding

child care, or difficulties in climbing the corporate ladder due to taking maternity leave.

However, there is a growing recognition within industry itself that current practices have to change. The main driver behind this is an acknowledgement that, in the face of acute labor shortages, an increase in women’s participation in the mining sector will be an integral part of the sector’s future success<sup>35</sup>. Thus the surveys for Australia cited above are the outcome of a research partnership between the Australian government and the Minerals Council of Australia to understand and to establish a baseline of the factors affecting women’s participation and experiences in the mining industry, with the objective of improving its attraction to and retention of female workers.

<sup>34</sup> Mineral Council of Australia (2006), Office for Women and Minerals Council of Australia (2007) and Sardar (2008)

<sup>35</sup> For example it is estimated that the Canadian mining industry will face a shortfall of some 60,000 workers over the next decade, with less than a 1000 expected to be filled annually through migration. An estimated 70,000 are needed to fill skilled worker shortfalls in the Australian mining sector. Ignoring women, who have and are still historically under-represented in the mining sector, will only serve to hurt profitability.



Essentially, rising labor costs and a shortage of workers in the face of high commodity prices hurts corporate profitability as projects are delayed. Companies have therefore begun to address what is essentially an issue of “bodies”: they need workers and it doesn’t matter whether these are male or female. This has meant that in order to attract and retain women, companies have to offer not only better remuneration but also better career prospects and better working

conditions for women. The number of women in Rio Tinto’s employment, for example, has risen from 11 percent in 2000 to 15 percent by 2007, with mothers being offered flexible working schedules to go home at night to their children. For remote mining sites in Australia, Rio-Tinto also offers its staff (men and women) fly-in and fly-out options in which the company flies employees to the mine and back again when the shift is over.

# CONCLUSIONS AND POLICY RECOMMENDATIONS

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This section summarizes the key findings of this policy note and proposes recommendations and reform areas that will help women to better access opportunities in the mining sector and related sectors. The overarching message is that

- a) **Mongolian labor regulations that lasted until 2008 restricted women's participation** in the high-growth and high-pay mining sector. Women's participation is limited to service support roles.
- b) **The impact of these regulations has been further compounded by gender stereotyping and cultural norms which encourage women towards "easier jobs" and a male-dominated mining industry culture where discrimination and harassment against women is widespread.**
- c) **A shortage of mining sector workers is already a key challenge for the mining sector in the coming years and will likely grow worse as the sector expands.** The Mongolian mining sector and associated industries will generate a significant number of jobs as the mineral industry scales up. Women are an easily available<sup>36</sup> but overlooked source of labor which companies will be foolish to overlook. The alternative – importing workers from overseas or waiting for more males to graduate – is more costly and in the case of migration possibly politically unfeasible. Recruiting from overseas is likely to be hard as well give that the mining industry globally is currently facing a severe shortage of workers, which is expected to worsen over the coming decade.

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<sup>36</sup> In terms of currently available mining and mining related graduates that could be hired, augmented by technical and vocational education programs to increase existing numbers.

- d) **Gender equal laws are a necessary and crucial first step towards guaranteeing gender equality and equity, but by themselves are not sufficient.** They also need to be backed up by institutional and cultural reforms at companies to ensure that gender equality is well-rooted in law *and* practice. Indeed, as the difficulties experienced by female workers in the Australian and Canadian mining sectors demonstrates, the presence of laws can provide the illusion of equality which may not exist in reality. However, in these countries serious efforts are being made to document women's working conditions, in an effort to improve them, and which are being supported and adopted by companies.
- e) **Another serious impediment is the lack of complaint mechanisms and the lack of gender equality awareness among people to use available mechanisms (trade unions, courts, inspection agency) for claiming their gender equal rights.** Women use these when they are laid off or miss eligible benefits but usually not against gender discrimination in the workplace. No programs exist to raise awareness of both employers and employees.

With regard to national policies that would be beneficial for women in the mining sector, the main recommendations are set out in detail below:

- a) **Implement the Law on Gender Equality passed in February 2011.** The law was prepared by the National Committee on Gender Equality (NCGE), in consultation with NGOs and the government and with assistance from the Asian Development Bank. The objective was to promote equality

between men and women in political, economic, family and educational spheres.<sup>37</sup> Aside from setting out the responsibilities of public agencies including through affirmative action, it also mandates the establishment of a complaint mechanism through the National Human Rights Commission and employment dispute commissions.

**b) Promote safe and healthy working practices for both women and men in the mining sector**

- The 1999 Ministerial Decree that lasted until 2008, contained extensive prohibitions that prevented women from working in key high-growth occupational areas, including the mining sector, for health and safety reasons. The regulations were withdrawn in 2008, but the issue of mining as a hazardous occupation as the recent experience of Chilean miners who were trapped underground for several months indicates. However these are concerns that apply to both men and women. Accordingly health and physical risk assessments for both men and women should be undertaken, in consultation with employers, trade unions and workers. In the case of women, these

assessments should also take into account three main categories of women: those of reproductive age but not breastfeeding or pregnant; pregnant women and women who are breastfeeding (see IFC 2010b for an example of how such assessments have been carried out in other mining companies). The objective of such an exercise can be two-fold: the first is to identify areas where current legal provisions are too broadly applied or outdated, and the second is to mandate better health and safety regulations for all, both men and women.

- The labor regulations, in combination with cultural stereotypes in an industry that is already not regarded as female-friendly have left a legacy of acute under-representation of women in the mining sector. It may also be possible to use ministerial decrees to directly address gender imbalances, as for example has happened in South Africa where the government set an explicit target that 10 percent of total employment in the mining sector comprise women by 2010 (Box 1).

37 ADB (2010) Country Gender Assessment

### **Box 1 Integrating women into the mining workforce: the example of Lonmin Plc in South Africa**

Lonmin Plc which is the world's third largest primary platinum producer and is based in South Africa, has successfully worked to incorporate women at every level in its operations in recent years. The move, supported by a three year partnership with the International Financial Corporation (IFC), has been driven by legislative requirements (the South African Department of Mining directed that 10 percent of all mining workers comprise women by 2010), a desire to create equal opportunities for women and also a view to the company's bottom line.

The Women in Mining (WIM) program focused on the following four aspects: preparation, recruitment, development and retention of women. To prepare the company to absorb women into the workforce, a detailed employment equity audit was conducted to assess gaps and issues hindering women's participation. The areas covered included: employment barriers, types of jobs suitable for women, policies to support recruitment and retentions, state of physical infrastructure for women such as toilets and change houses, management structures, cultural readiness, communication, monitoring and evaluation strategies.

As a result of the audit, the following steps were taken to prepare for the recruitment and retention of women. First the management and governance structures were changed at Lonmin. For example, a steering committee composed of senior executives was set up to provide guidance, troubleshoot and monitor support for the WIM program as well as an employment equity forum that met monthly, and one senior woman VP was appointed as an internal champion for the program. Incentives were also established, notably a scorecard which required each department to achieve female recruitment targets as well as performance scorecards for managers.

Also four WIM related policies were identified in order to institutionalize the programs. These include general guidelines for the WIM program, an employment equity policy that required managers to provide equal recruitment opportunities for women, a pregnant and breastfeeding policy that provided direction on how to handle these issues including alternative placement strategies, and a sexual harassment policy that clearly spelt out what constituted sexual harassment, the complaint mechanism, and consequences. The physical environment was also made more comfortable for women, e.g through building separate toilet and change facilities in underground shafts, and designing a two-piece overall for women. A comprehensive communication strategy was also developed to communicate the key features and female success stories of the WIM program, awareness campaigns and workshops on sexual harassment.

What was the outcome? Starting in 2007, the company had raised total female employment from 4.6 percent to 6.9 percent in 2009, an increase of 42 percent (or some 480 women). Other key program successes included the adoption of the four WIM policies, including on employment equity, sexual harassment and maternity leave. 12 women change houses and nearly 200 toilets were built in mining shafts.

The project is also notable for the fact that it provides a clearly documented practical approach towards raising women's participation in the mining workforce. In this sense it is a manual that can be amended/modified to be used in other countries. For example, it sets out templates that can be used for conducting a physical health assessment and suitability of jobs by gender, sets out how salaries should be evaluated in order to determine to what extent and why wage disparities are based on gender and concrete recommendations to address discrepancies and so on.

Source: IFC (2010a) and IFC (2010b)



c) **Provide technical and vocational training to women to ensure that they are suitably qualified for mining sector jobs.** Currently there are high levels of occupational segregation by gender in the mining workforce, with women working mainly in service support roles (catering, laundry, cleaning). The government could set up appropriate technical, vocational and business education programs that provide the skills for women to enter professional mining career streams. This would require various arms of the government, including the Ministry of Social Welfare and Labor, Ministry of Mineral Resources and Energy and Ministry of Education to coordinate with each other, with mining companies and with local (and possibly international) higher education institutions to assess particular skills required **and how to provide training on those skills.**

d) **Enforce sexual harassment laws and create awareness among victims on their legal rights.** Sexual harassment has been widely documented in educational institutes and in the workplace in Mongolia (ADB, 2010), but it can be particularly acute in mining sites. Companies (and universities) should be encouraged to introduce a systematic (and sympathetic) policy vis-à-vis sexual harassment and also provide complaint mechanisms through which women can report their concerns. Nationally, the government can try and increase awareness of sexual harassment through advertising and information campaigns as well as setting up support services for women experiencing sexual harassment.

e) **Female participation in the mining sector concerns not only women as workers, but also women as owners.** As discussed previously, a key problem with the mining industry is that there are insufficient women in managerial or leadership roles, and this is one area that may qualify for government support.

A good example of appropriate policy actions – on which the Mongolian government has made progress – concerns the method by which mining licenses are awarded. Until recently, the process by which mining licenses were issued was ad hoc and opaque and led to allegations of

corruption and nepotism in license allocations. It is crucial that women, who tend to have smaller business and political networks than men and were therefore at a particular disadvantage with respect to obtaining licenses, face a level playing field with regard to bidding for these licenses. The Ministry of Mineral Resources and Energy has recently prepared and adopted regulations that increase the efficiency and transparency of mining cadastre operations and has implemented a fully computerised cadastre management system to further increase the transparency and integrity of the licensing system.

Other policy actions that might be suitable include supporting women business forums including meetings with mining sector professionals and investors (male and female, domestic and overseas) where women entrepreneurs are able to network and to exchange ideas for business opportunities in mining. Women as owners of supplying companies should also not be overlooked and useful policy actions in this regard include business training and micro-credit finance.

f) **Mandate reporting of how companies are applying equal opportunity policies.** These policies are non-existent as such, while the few general provisions in the labor code are not enforced. It also slips the attention of the Professional Inspection Agency which is mandated to oversee labor laws and standards. While there has been considerable emphasis in recent years on corporate social responsibility vis-à-vis environmental, gender and social impacts on the communities in which mining companies are situated, relatively less has been attention paid to gender issues *within* the workplace. The government (or the NCGE) could produce a list of best practice recommendations for mining companies, and require companies to either comply with or explain why they are not doing so. This is an example of “light touch” regulation followed, for instance, in the UK with respect to corporate governance, which recognizes that the burden for compliance and reporting is much higher for smaller companies.



The main areas of concern at the company level are how to change industry “culture” and practices with regard to hiring, developing and retaining female staff. These include issues of diversity, health and occupation safety, sexual harassment, inflexible work practices and occupational segregation. The main recommendations in this area are:

- a) Review company policy, communicate commitment to all stakeholders and establish clear benchmarks with penalties.** Companies need to be aware that by overlooking an easily and locally available pool of labor, they are harming their own profitability. The first step is management commitment that is reinforced by clear incentives and targets, with clearly stated consequences in case of failure to progress. Management commitment also needs to be communicated to and shared with by other stakeholders. These include the Human Resources Department, unions and/or unorganized workers, core operations (mining and processing) in mining firms. These stakeholders can be brought on board through explaining why women are a valuable part of the workforce e.g through sensitization workshops. This could also include incorporating gender considerations (e.g. the number of women on the team, whether women have been able to participate in training and courses that could help career advancement) in performance indicators for senior management (See Appendix C for an example on how Lonmin Plc, the third largest global platinum producer has incorporated women into its workforce in South Africa).
- b) Assess existing operations to assess the extent to which they incorporate women and changes that are needed<sup>38</sup>.** This includes audits of where the female workforce is located within an organization, and what is impeding the presence or career mobility (horizontally or vertically) for women in core mining

operations. It also requires an assessment of what jobs are most suitable for women, and whether existing infrastructure supports female workers. For example, change houses, separate accommodation facilities for women and families, underground toilet facilities are all important factors that could help improve existing work practices vis-à-vis women.

- c) Improve workplace culture, address career development issues and provide gender appropriate work options for women.** The sector needs to address the “maleness” of the industry by awareness raising activities, ensure that women have sufficient access to complaint mechanisms and have a zero-tolerance policy towards sexual harassment. Flexible work policy arrangements which take into account the family and care responsibilities of women and child care facilities are also important. With regard to career development, given the low levels of female participation in the minerals sector, affirmative action policies may be needed initially with clear targets identified, substituted by training and mentorship opportunities later on.
- d) Revise recruitment/hiring strategies with the objective of raising the share of female employment across all professional categories.** Actions that companies could consider include recruiting women from undergraduate and graduate campuses from across a broad range of disciplines (engineering, metallurgy, management, finance etc) so as to raise awareness of the kind of career possibilities that exist in the mineral sector. Vocational training/ internships targeted to women may also help in offsetting some of the negative perceptions of the industry and help influence their educational and career choices.

<sup>38</sup> See IFC (2010b). Women in Mining: A Guide to Incorporating Women into the Workforce, Draft V.10, IFC. This provides comprehensive details and guidelines on how to assess mining operations, facilities and services and the degree to which they are female-friendly.

## APPENDIX A:

# THE CGE-MAMS MODEL FOR MONGOLIA

MAMS is a multisectoral real CGE (computable general equilibrium) model that can incorporate policy efforts to achieve the Millennium Development Goals (MDGs) and more broadly, poverty reduction and growth by explicitly accounting for and modeling the health, education, and water-sanitation and infrastructure sectors and their linkages with the rest of the economy. As noted in Lofgren and Diaz-Bonilla (2006), the main requirement is the development of a country specific database in a social accounting matrix (SAM), that replicates the behavior and structure of the economy of the economy. Its main advantage over other macro models is that it has much richer set of households, sectors and factor input types and can be easily scaled up or scaled down depending on the desired degree of sophistication and complexity. MAMS also has micro-foundations, i.e. prices clear markets (both product and factor), producers maximize profits and consumers maximize utility.

The baseline SAM for Mongolia is calibrated using publicly available national statistical data, notably 2005 input-output and supply-use tables. The SAM provides a comprehensive account of the circular flow of income in an economy, encompassing factors of production, institutions (households, government, the rest of the world), demand (intermediate and final, with the latter including consumption, investment, exports) and supplies (domestically produced goods and imports). The main closures adopted to achieve equilibrium are that government spending adjusts

to clear the budget, the exchange rate adjusts to balance the current account and domestic household investment (or private investment) adjusts to clear any savings-investment imbalance.

The MAMS model for Mongolia is disaggregated as follows: there is one representative household which primarily earns its money from labour income, from the ownership of private capital and mining capital. Households pay taxes to the government and also receive transfers from it, as well as from the rest of the world. The economy has 6 sectors, producing 6 different goods and services, namely agriculture, mining, tradable (mostly manufacturing), construction, non-tradables<sup>39</sup> and the public sector<sup>40</sup>. In addition, there are three main factors of production: labour which is disaggregated by gender, private capital and mining capital. Each sector also uses the products of other sectors as inputs, as well as two other goods which are entirely imported as intermediate inputs, namely fuel and intermediate capital which is used solely by the mining sector. Overall labour supply is determined by exogenous population growth. Private capital formation depends on private savings and investment rates in the economy. Baseline factor payments as a percentage of total input payments are given below.

<sup>39</sup> Wholesale and retail trade, hotels and restaurants, financial intermediation, real estate, renting and other activities, utilities.

<sup>40</sup> Public Administration and Defence, Health and Social Services, Education, Other Community, Social and Personal Services

**Table 3. Baseline factor payments as % of total input payments by sector**

% of total

	Agr	Con	Pvt Trad	Pvt Non-Trad	Min	Gov
Intermediate exc pvt non-tradables	19	63	50	27	33	65
Pvt non- tradable	5	14	18	23	6	7
Labour	19	13	16	23	7	23
Pvt. Capital	57	9	17	28	5	5
Min. Capital	0	0	0	0	48	0

## APPENDIX B: REGULATIONS RESTRICTING WOMEN'S EMPLOYMENT IN THE MINING SECTOR (1999-2008)

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### ORDER OF THE MINISTER OF HEALTH AND SOCIAL PROTECTION

13th August 1999

Number A/204

Ulaanbaatar city

TO ORDER on the basis of the article 101 and the section 5 of the article 109 of the Law on Labor of Mongolia:

1. To reapprove the “Listing of works prohibited to be performed by women” as an annex 1 and the “Listing of workplace prohibited to be performed by minors” as an annex 2.
2. To oblige senior authorities of organizations and entities to work in compliance with the listing.

MINISTER'S ROLE  
EXECUTIVE

S. SONIN

<b>Mining Extractive Industry</b>	<ul style="list-style-type: none"> <li>All kinds of underground work, oil exploitation and refining, use of flammable gas</li> </ul>	<b>Air Transport</b>	<ul style="list-style-type: none"> <li>Airplane mechanic</li> <li>Airplane connector</li> <li>To perform a technical service for airplane and its engine</li> </ul>
<b>Leather Industry</b>	<ul style="list-style-type: none"> <li>All kinds of work using chalk (bleaching powder) in its lifecycle such as tanning, preparing extract from sodium and chrome, to carry and gather a tanned leather</li> </ul>	<b>Wood preparation and generation industry</b>	<ul style="list-style-type: none"> <li>All works transmitted through wood generation and water float</li> <li>To load and unload timber by hand</li> <li>To cut, sort and collect wood in the underground storehouse</li> <li>To compose chlorine of a paper mill</li> <li>To crush wood</li> </ul>
<b>Glass industry</b>	<ul style="list-style-type: none"> <li>Blow a glass by mouth</li> <li>To crush a carbide by hand</li> </ul>	<b>Construction assembly</b>	<ul style="list-style-type: none"> <li>To assemble a stovepipe and canal</li> <li>To dig a well</li> <li>To pour, broke and crush a platen by hand</li> <li>To crush a rock</li> <li>Autoclave men</li> </ul>
<b>Textile industry</b>	<ul style="list-style-type: none"> <li>To prepare aniline salt and flux by hand</li> <li>To prepare hydrochloride by hand</li> </ul>	<b>Social Services</b>	<ul style="list-style-type: none"> <li>Clean the drainage filter</li> <li>Plumber of drainage canal</li> </ul>
<b>Publishing industry</b>	<ul style="list-style-type: none"> <li>Printing machine</li> <li>To develop and poison a picture, zinc and an offset printing</li> <li>To mould a stereotype</li> <li>To melt lead</li> <li>Letter roll</li> <li>Machinist of an one-sided chop machine</li> </ul>	<b>Common work and profession</b>	<ul style="list-style-type: none"> <li>Antenna work</li> <li>To pot bitumen and asphalt</li> <li>Mountain rescue work</li> <li>Parachutist and fireman</li> <li>To work in contact with mercury</li> <li>To blend and dye paint with mercury</li> <li>Stoker of all kind of heat boilers</li> </ul>
<b>Tailor Industry</b>	<ul style="list-style-type: none"> <li>Machinist of a minute and separate chopping machine used for incise transmission</li> <li>To operate a special function iron press</li> </ul>		<ul style="list-style-type: none"> <li>To clean, dye, repair and seal tank and cistern going inside of it, which stores flammable and greasing materials</li> <li>To mix ethyl with fuel</li> </ul>

<b>Meat industry</b>	<ul style="list-style-type: none"> <li>• To cause numbness of cattle, pig and bird, and to execute them</li> <li>• To butcher cattle</li> <li>• To work in a storehouse with amikan refrigerator</li> </ul>		<ul style="list-style-type: none"> <li>• To clean heat boilers, stovepipe, canal and camera</li> <li>• To extract and carry coal, lava and ash</li> <li>• To fire heat boilers, repair and clean boiler house, carry fuel and ash</li> <li>• To melt, cast, discharge and pack cast iron and metal</li> </ul>
<b>Railway transport</b>	<ul style="list-style-type: none"> <li>• Train connector and composer</li> <li>• Install twin wheel band and rim</li> <li>• Bridge locksmith (plumber)</li> <li>• To tan, lift and unload bearer (tie)</li> <li>• To clean, bloat and blow stovepipe</li> <li>• Padding men</li> <li>• To go under the train for service and control check</li> <li>• Maintenance work of diesel-locomotive, supply equipment, fuel and electric motor</li> <li>• To block in a road by an electric blocker</li> <li>• Driver of heavy vehicles for road maintenance</li> </ul>		<ul style="list-style-type: none"> <li>• To melt, pour, stretch, cast, mould and scroll pot lead, to make and seal an accumulator, to plumb cable, to generate a pot lead made things by hands</li> <li>• To melt a base metal such as pot lead, copper, mercury, gold, zinc and silver out of ore</li> <li>• To seal channel and canal</li> <li>• Striker</li> <li>• Auto machine operator and presser that prints metal in a cold condition with a power higher than 25 tones</li> <li>• Base machinist of drum chipping</li> <li>• Smasher</li> <li>• Steam auto machine' wheel</li> </ul>
<b>Water transport</b>	<ul style="list-style-type: none"> <li>• Diesel engineer of a ship</li> <li>• Steersman/pilot, sailor-man</li> <li>• To dive</li> <li>• Ship mechanic</li> <li>• To put a seamark</li> </ul>		<ul style="list-style-type: none"> <li>• Stove/boiler repairmen</li> <li>• To seal and repair high pressure canal</li> <li>• To pour an electric filter</li> <li>• Machine operator and repairmen of a stationary diesel electric station</li> </ul>
<b>Auto Transport</b>	<ul style="list-style-type: none"> <li>• Vehicle with more than 2.5 ton of carrying capacity, driver of a vehicle with more than 25 seats</li> <li>• Flammable and greasing material, storing reservoir, to repair internal part of cistern, to seal</li> </ul>		<ul style="list-style-type: none"> <li>• Compressor man</li> <li>• To polish and cover metal by a chemical method</li> </ul>

Source: Government of Mongolia and World Bank

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