



School of Mining and Geosciences

GENDER IN KAZAKHSTAN'S MINING INDUSTRY

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Thesis submitted to the School of Mining and Geosciences of Nazarbayev
University in Partial Fulfillment of the Requirements for the Degree of
Master of Science in Mining Engineering

Nazarbayev University

03/23/2022

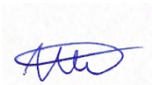
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ABSTRACT

Globally, the mining industry has been considered a male-dominated occupation due to various factors. Gender barriers, such as the gender pay gap, "glass ceiling," discrimination, prohibited working positions, and cultural and social stereotypes discourage women from joining or remaining in the mining industry. However, it has been shown that women's inclusion brings benefits, including a wider talented working pool, support of local expertise, and productive working teams. In addition, with the mining sector's changing economic, social, and operational landscape, there is a strong demand to address gender diversity to attract and retain more females within its workforce.

In Kazakhstan's mineral industry, gender equality reflects the global trend. However, the absence of information in the public domain makes it difficult to accurately assess the depth of the inequity within the mining workforce to-date.

This thesis investigated the status of women in the Kazakhstan mining industry by evaluating employment, pay rate, education, and companies' relation factors. In Kazakhstan's academia, women's participation is less than male involvement. The results showed that women represent only 15.7 percent of the university cohort studying geology and mining and comprise only 19.2 percent of the mining workforce. Working in the mining industry is highly paid, and the gender gap is decreasing through the years, resulting in 5 percent. Which demonstrates profitable working perspective for all, men, and women. In the employment process, for the past decade, the share of women in the mining sector decreased, which means the promotion of gender diversity by the local companies and existing educational programs do not address the issue.

A diverse working force has a broader view with different viewpoints on the development of mining operations. Reconsidering the current state of women in mining labor could lead to socio-economic growth and sustainable development, i.e., preserving local culture strengthening social relations, including ethnic matters. The recognition and understanding of the current gender barriers for women in the mining industry will draw attention to the issues faced by women in mining.

ACKNOWLEDGEMENT

The completion of this study could not have been possible without my thesis Supervisor Professor Zauresh Atakhanova, and co-Supervisor Professor Eleonora Widzyk-Capehart. I would like to express gratitude for providing me with an opportunity to work on a topic that interested me. For all the help, support, guidance, patience during semesters of work, and contribution to this thesis research.

I also would like to give my friends and family special thanks, especially my mother Raushan Shtey and my father Vadim Shtey, for constant moral support during my study, strong encouragement, and reasonable advices.

Last but not least, I want to acknowledge the contribution of my beloved uncle Pavel Shtey; without you none of this would indeed be possible.

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1. INTRODUCTION

1.1 Background

Historically, the mining industry has been considered a male-dominated occupation due to various factors. However, with the mining sector's changing economic, social, and operational landscape, there is a strong need to address gender diversity within its workforce. To manage the mining sector for the benefit of all stakeholders, it is necessary to recognize and comprehend the benefits that women's involvement might bring to the mineral industry and the existing barriers preventing women from becoming fully engaged.

Social-economic growth, development of the sustainable area, diverse working pool, and more productive working teams are often listed among the benefits that women's participation brings to the mining companies. However, women encounter numerous difficulties, such as stereotypes, lack of trust, glass ceiling, fear of denial, sexism, and gender pay gap that prevent them from either entering or remaining valuable members of the mining workforce.

Gender equality in the mining industry of Kazakhstan has not been investigated thoroughly yet. Publications related to the gender gap in Kazakhstan do not generally consider the mining labor sector, which could be attributed to factors influenced by cultural, societal, and legal aspects existing in Kazakhstan.

However, to address the gender imbalance, it is vital to recognize the barriers preventing women's equal involvement in the mining workforce, which would then inform the government, mining companies, and civil societies of the measure to be taken towards equal opportunity for men and women. Subsequently, promoting and enabling more equitable resource management by recognizing and supporting women's engagement in the mining industry as mine workers, community members, and resource decision-makers would lead to economic and societal benefits for the country.

1.2 Problem Statement

The understanding of the current employment conditions for women in Kazakhstan's mining industry will bring attention to specific areas of gender diversity and existing gender barriers. This recognition will enable all stakeholders, especially mining companies, to focus their efforts on reaching gender equality in the workplace by addressing specific concerns, including but not limited to:

- Low employment rate: women constitute 19 percent of the workforce within more than six hundred and fifty mining enterprises operating in Kazakhstan.
- “Glass ceiling: an unacknowledged barrier to advancement in workplaces leads to low participation of women in the decision-making process in Kazakhstan’s mining industry.
- Prohibited working positions: list of prohibited working positions for women affects women’s ability to procure employment within the mining industry
- Social and cultural barriers: women are considered the primary caregivers and are, traditionally, expected to be stay-at-home makers, limiting their ability to pursue professional careers.

1.3 Objectives of the Thesis

1.3.1 Main Objective

The main objective of the thesis was to identify the current status of gender equality within Kazakhstan’s mining industry.

1.3.2 Specific Objectives

The following activities were undertaken to accomplish the main objective of this thesis:

- Completing a thorough literature review on gender equality in the mineral industry worldwide and in Kazakhstan.
- Identifying the existing barriers for gender diversity and gender issues in Kazakhstan’s mining industry.
- Undertaking qualitative statistical analysis of gender inclusivity and educational impact on potential work sources for women in Kazakhstan’s mining industry.
- Conducting quantitative analysis of women engagement within the mining industry of Kazakhstan and the influence of local mining companies on diversity policies.

1.4 Hypotheses

1.4.1 Hypothesis 1

It is hypothesized that the main gender barriers for females inclusion in the mining industry in Kazakhstan are related to social and cultural concepts: marital status, child-rearing responsibilities, public opinion, and stereotypes which leads to recruitment discrimination and pay gap.

1.4.2 Hypothesis 2

In Kazakhstan, women prefer to work in the healthcare, education, and service industry rather than the mining or construction industry, despite an increased number of women studying engineering disciplines.

1.4.3 Hypothesis 3

The local female population faces work restrictions in the mining industry due to government-based exclusions.

1.5 Justification of the R&D

The changing landscape of mining operations and increased pressure to meet international human rights standards in recent years have prompted the mineral industry to focus their efforts on gender equality in the workplace.

Assessment of gender diversity in industries typically considered male-oriented has shown that women's inclusion within the workforce brings operational and safety improvements and contributes to the economic improvements of the countries and an increase in societal well-being.

However, to adopt and implement the inclusivity strategy with increased engagement of the female workforce, mining companies worldwide need to understand the local labor landscape and the obstacles that might stymie the progress towards gender equality.

Therefore, this thesis entitled “Gender in Kazakhstan’s mining industry” addressed the gender diversity within Kazakhstan’s mining workforce.

1.6 Scope of work

The procedures followed and work performed during the study are described in five (5) chapters as follows:

1. *Introduction* defines the study's objectives hypotheses and provides an overview of the scope of the thesis and motivation for this study with its significance to the mining industry.
2. *Literature review* summarizes the existing studies into women's inclusivity and gender diversity in the mining industry worldwide, followed by a specific focus on the Kazakhstan mining industry labor status, delineating the benefits and the barriers for women’s inclusion in the workforce.

3. *Research methodology* describes the study's limitations, data acquisition, and approach to data analysis.
4. *Qualitative and quantitative data analysis* presents the results of data assessment for the selected variables: meaning units, code words, and indicators that consist with words 'women', 'women in mining,' and 'female employees.'
5. *Conclusions and recommendations* summarize the main results of the analysis and provide recommendations for further studies.

2. LITERATURE REVIEW

2.1 Women in the mining industry

Despite considerable advances in women's inclusivity in the labor market, the mining industry is still regarded as a male-dominated profession. In 2017, women constituted between 5-10 percent of the mining industry workforce, placing the industry with the lowest index of gender parity compared to business, office jobs, nursing, and other fields (Ledwaba, 2017). However, according to Ellix (2021), by 2021 women's employment has risen to between 8-17 percent of the mining workforce globally, including low labor workers.

Spitz & Trudinger's (2019) investigation shows that working teams with a high diversity rate performed more productive in the financial and operating area within the mining industry. In addition, developing inclusive and protected fields create an attractive environment for different social communities, hence more wide working pool to recruit personnel (Patel, 2016).

2.1.1 Kazakhstan mining industry vs. women employment

The mining industry contributes significantly to the economic security of Kazakhstan. Currently, the main industrial priorities for Kazakhstan are mining, manufacturing, and agriculture. By 2021, four thousand five hundred seventy-nine (4579) mining operations and mining-related organizations were maintained in the country (Kekchebayev, Zhakupova & Suleimenov, 2021). According to Medetbekova & Ishekenova (2017), in 2016, the mining sector accounted for 51.9 percent of Kazakhstan's total industrial output and contributed 28 percent of the country's GDP.

Women's employment in Kazakhstan's mining sector was reported at 12.19 percent in 2018, with 5.1 percent of small and medium-sized enterprises (SME) led by women. However, Ryskaliyev et al. (2020) found that women in Kazakhstan face gender inequality in the labor market considered masculine, such as mining, due to cultural barriers.

2.2 Gender barriers in Kazakhstan's mining sector

Different gender barriers are categorized by Fernandez-Stark, Couto, and Bamber (2019), including the risk of safety due to unsafe conditions, framework problems, physical prerequisites, location of working place, and intolerance. Spitz and Trudinger (2019) list several issues preventing women participation in the mining sector, including fly-in-fly-out (FIFO) labor, which may prevent flexible working arrangements, sexual harassment, lack of gender awareness, exclusion of women from the decision-making process, mistrust in

competence, and recruitment discrimination. Specifically, Spitz and Trudinger (2019) view FIFO labor in the mining sector as mainly designed for male personnel since women are expected to create living conditions for their families while social opinion and immediate environment usually do not endorse FIFO employment for wives and mothers. Perez (2019) views the gender issues of diversity from a macro perspective wherein mining careers are designed for men.

Additionally, health issues experienced by women, which are often different from those of men, such as infertility, may be caused by working in potentially dangerous conditions, whereas women's health is not specifically considered and, therefore, data is often missing that would regulate the occupation conditions.

Balancing family and working life is more complex for women due to cultural, societal, or other aspects that often place more family-related responsibilities on women than men. Perez (2019) claims that the main problem is not in women existing data about livelihood, but rather it is in disregard and neglected concern from society. Women living at the poverty level settle for deprived and unsafe working environments.

Gender-based violence is one of the main problems in mining labor. According to Botha (2016), female stakeholders in the mining area are at risk of sexual harassment and abuse from male colleagues. According to Hinton et al. (2003), women working as miners in Africa and living in poor conditions are forced to work in sex services. Some women employees shared their experience of how male co-workers ignore providing the required assistance to the new female co-workers, i.e., the traditional work orientation procedure, companionship, and cooperation. In its place, they tend to ignore, harass, and criticize their female co-workers.

Women in Kazakhstan experience several difficulties in regular life, such as domestic violence, sexual exploitation, and misogyny. By 2019, over 2 million Kazakhstani women had suffered domestic abuse (Zhapisheva, 2020). Married female workers working in FIFO labor at night shifts experienced jealousy and condemnation from their spouses and experienced rejection because of possible breadwinner positions that women could achieve (Park, Metzger, Foreman, 2019).

Kazakhstani government does not regulate terms of informal employment (Mussurov, Sholk, & Arabsheibani, 2019). Therefore, cases of harsh conditions are recorded and known by mining stakeholders. Still, they are not provided to the broader public and are used to dissuade most potential females from taking up employment within the mining sector.

Gender segregation causes stagnation of gender inclusivity, which is becoming a big issue for social development and the relationship between men and women, laborers, managers, and CEOs. Because of the traditional view on women's role models in Kazakhstan's reality, it is most unlikely for a female to reach a director's position, regardless of her qualifications. The unspoken rule of the "glass ceiling" is still a common practice in Kazakhstan's mining companies (Kuzhabekova, Janenova & Almkhambetova, 2018). Ryskaliyev et al. (2020) discovered that from 2006 to 2015, women's employment compared to men increased from 62 percent to 67 percent, the gap between men and women's workforce is 33 percent. Moreover, women's participation is also very low in highly technological, innovational, and infrastructural projects. According to Kulekeev et al. (2019), in the countryside, every third Kazakhstani woman is a freelance in farming, with the total earnings just covering daily expenditure, which prevents them from investing in professional development.

2.2.1 Engineering Education

One of the primary factors of female workforce shortage in the mining sector remains the gender segregation of professional education, which lays the foundation for further differentiation of employment (Alshanskaya, 2020). Historically, women used to avoid engineering professions. However, this has changed over time. For example, in the United States in 1995, the number of women obtaining an engineering degree was 2 percent, while nowadays it has risen to 18 percent (Park, Metzger, Foreman, 2019).

According to Vetlugin et al. (2022), the Ministry of Education in Kazakhstan provides more scholarships to STEM and engineering programs. However, the educational trends from 1966 to 2015 show that the majority of bachelor's degree obtained by women were in the Medical Sciences and Education fields rather than in the Engineering field (Indicators, 2015). In the interview, Lazarev (2022), as executive director for administrative issues of the metallurgical enterprise, says: "Today there is a problem with recruitment. For example, we take mining professions. According to the Republic of Kazakhstan legislation, these professions have restrictions on the admission of persons on underground operations. This primarily concerns gender restrictions. We have more than half female students."

In addition, in many cases, after obtaining the engineering degree, women were willing to make a career switch in favor of more "protected" areas, i.e., accounting, home economics, medicine, science and education, and beauty (Indicators, 2015).

2.2.2 The gender pay gap in Kazakhstan's mining labor

The gender pay gap is a wage difference between men and women in labor. According to Mayes and Pini (2014), men tend to earn more than women. Reeson, Measham, and Hosking (2012) indicated that, in the mining industry, men gained more revenue proportionally to the percent of the working pool, while female personnel suffered from the decrease of proportion in the workforce, therefore, diminution of salary. They also showed that mining companies provided fewer opportunities to the female community to achieve better work positions and higher pay salaries, which resulted in pay disproportion.

The gender pay gap at the corporate level in Kazakhstan's mining sector is relatively high. According to Alshanskaya's (2020) study, women in Kazakhstan's population accounted for just over half of the total number of citizens. However, the contribution to the country's economy, growth, and wealth is not realized its potential yet. The gender gap index in Kazakhstan, according to the World Economic Forum (2018), decreases every year; since 2014, Kazakhstan has lost 17 positions on the WEF gender gap list and, by 2018, the country ranked 60th out of 149 countries. The gender pay gap reached 43 percent in Kazakhstan in 2020. A woman's average income by type of economic activity is 438.6 thousand tenge, and the average income of a male worker is 763.9 thousand tenge (Roshchin & Yemelina, 2020). Therefore, women often cannot fully achieve the benefits because of their position in the labor market. The mining labor market remains quite segmented, affecting the gender gap and impeding the country's inclusive growth.

According to Alshanskaya's (2020) findings, the pay gap between men and women in Kazakhstan's mining industry in 2020 is 5 percent. The lower number of working women than working men results from women spending a shorter time at work due to household responsibilities. Overall, due to family responsibilities, women work longer hours than men. Alshanskaya (2020) discovered that in the Republic of Kazakhstan, women spend 4 hours 14 minutes on housework, while men spend 1 hour and 28 minutes, or almost 3 hours less. Studies of Semykina et al. (2010) and Kireyeva et al. (2019) show that gender imbalances in unpaid work deprive women of economic opportunities and hinder the qualitative growth of national economies. Consequently, more comprehensive access to work positions for women would decrease the gender pay gap index.

In addition, sectoral and professional differentiation in mining labor limits the workplaces for the female community. The unemployment rate in the Kazakhstani women's community was 5.4 percent in 2018, which is higher by 1.1 percent than men's unemployment rate. According to Alshanskaya (2020), greater access to jobs does not significantly reduce the earnings gap between men and women. In addition to sectoral differentiation, the labor market is

characterized by occupational segregation. This factor means that women are underrepresented in senior management positions in most areas of the economy (glass ceiling). Kireyeva et al. (2019) reported that employers usually favor hiring male workers, and they provide three times lower wages if they engage female workers.

2.2.3 Recruitment principles of local mining companies

Women of any age have considerably fewer chances of getting a job in the mining sector when they compete with a male candidate, even though they might be more competent or have a very high level of expertise. Furthermore, employers commonly fire female personnel first if economic conditions require a reduction in the workforce (Ryskaliyev et al., 2020).

Women have a poor choice of available jobs in the mining sector as companies prefer not to hire women in their reproductive years (Ward, 2010). According to Park, Metzger, and Foreman (2019), mining companies tend to avoid women with children as candidates due to biased perceptions. The case where a female operator had to work double hard to prove her professional worth after having a child was noted. In Park, Metzger, and Foreman's (2019) findings, one mining expert verified this notion stating that some companies refuse to hire females of a specific age because they believe they will marry, have children, and thus quit working. According to Ryskaliyev et al. (2020), the Labor Code of the Republic of Kazakhstan defines persons with family responsibilities, i.e., women, subjects to whom labor capitals are provided, compensation, benefits, the legal status of which is differentiated. Modern legislation contains norms that allow women to keep their jobs during maternal leave and keep their jobs without consequences for the child's life in the postpartum period.

Lack of representation of women in the mining sphere caused the female community negative experiences and fear of denial by the industry (Spitz & Trudinger, 2019). Bryant and Jaworski (2011) suggested that if most mining companies looked at competence and knowledge first, the number of women in mining could rise. More women would be attracted and will remain to work in the mining industry.

Kee (2006) exposed the Australian practice of the “glass ceiling” phenomenon, shared globally. It is common in situations where women and men are compared regarding the range of pay income and its possible barriers. On the other hand, Booth, Francesconi, and Frank (2003) presented a definition of “sticky floor,” which has similar patterns as “glass ceiling.” Authors defined it as a condition in which equal men and women could be assigned to a similar pay range or position, although where women are assigned to a lower level and men to a higher

level. Studies conducted by Arulampalam, Booth, and Bryan (2007) show that the “glass ceiling” is prevalent in most countries.

Kazakhstan’s position is not different from other CIS countries with respect to the list of prohibited positions and recruitment principles. In 1932, a list of prohibited working positions for women was developed and was introduced in 1974 to protect women and their reproductive health during the Soviet time. Restrictions are related to the severity of work, harmful, and dangerous working conditions. Local women are not allowed to work in some areas related to mining, oil production, metalwork, or construction and installation work (Ivanilova, 2021). According to ‘Order on approval of the list of jobs, in which it is prohibited to employ workers under the age of eighteen, the maximum rates of carrying and moving weights by workers under the age of eighteen, and the list of jobs, in which it is prohibited to employ women, the maximum rates of lifting and moving weights manually by women of 2015, No. 944’ (2015) proposed by Health and Social Development of the Republic of Kazakhstan (2015), the list of prohibited professions for women include 287 positions. In Kazakhstan’s mining and extraction area, 36 professions are banned for women.

However, innovative industrial growth reached Kazakhstan’s labor for the past century. Ore extraction and following activities related to mining operations have been developed and improved during the past decades through technology developments. Nowadays, controlling the working process using automated tools is becoming a basic framework for most Kazakhstan mining companies. List of prohibited professions for women could create unofficial employment where employed women are vulnerable and are not protected by legislation.

International Labor Organization (ILO) encourages countries’ governments to repeal the list of “prohibited professions for women,” considering this discrimination against women in the workplace. International experts insist that men and women should have equal access to all types of work. It is only necessary to ensure safe working conditions for everyone (Ivanilova, 2021).

2.3 Influence of automatization on women inclusion in mining workforce

For the past decades, mining technologies have been developing rapidly, and many labor practices benefit from the implementation of machine learning, advanced remote digital control, and analytical monitoring methods (Durrant-Whyte, Geraghty, Pujol, & Sellschop, 2015). According to Ivanilova (2021), some work processes require more physical strength, which most women do not have. However, innovation and technology development is growing,

and now it is unnecessary to have the physical strength to perform the work. It is more important to have an engineering background and understanding of the working process. The new requirements of general skills in the digital age give human capital more opportunities to pursue the desired job in the mining field. Mining leading companies seek to automate all possible operations to develop healthy and safe working conditions for mine stakeholders and increase operational efficiency. Thus this innovation may provide equal opportunity for women and might attract more women to join the mining industry. Baggaley (2017) reviewed the possibility of robotic systems replacing mine workers in dangerous underground conditions, where people could be in charge and direct the robot using attributed software. Many control functions have now been converted to remote control; if previously an operator had to twist huge valves with physical force, now he only has to master the remote operating console. Therefore, the line between "male" and "female" professions gradually disappears.

2.4 Historical, cultural, and social impact on gender diversity

According to Spitz and Trudinger (2019), every culture has a different view of women's lifestyles. In some cultures, women working in mines "attract" bad luck because of "women's energy."

In mining history, some tragic cases adversely interpreted women's participation leading to banning the female community from operation involvement for many decades. Local communities created rules and policies that hindered the female population working at the mining sites. However, in some cultures, for safe production in underground mines, the picture of the Holy Lady is posted at the entrance (Spitz & Trudinger, 2019).

Women's participation in the mining industry differs every decade. For instance, in India, the current number of women in mining is 6 percent. However, in the early 20th century, the rate of women in mining areas was estimated at 44 percent (Lahiri-Dutt, 2012). According to Eveline and Booth (2002), the Australian mining industry also practiced women mainstreaming in 1980th with engaging women in working operations. It was called the "decade of Equal Employment Opportunity legislation" when the women community could get working positions despite gender factors and were protected by environmental legislation. Nevertheless, before the 18th century, women and children could not participate in the mining sector due to unsafe and hazardous conditions.

Religion is a significant part of social movements in Central Asian counties. Thus, the religious fundamentals are also part of the post-Soviet countries. Behzadi (2019) observed the case study

of Tajikistan's mining industry regarding Muslim masculinity towards women miners. The author raises the importance of a safe work environment for vulnerable communities since male workers perform inappropriate behavior, which affects not only mine working process but the entire operation. The discrimination rate of minorities in the Kante region is relatively high compared to other regions, indicating the Honor-and-Shame system's significant influence in Islam. According to Reeves (2013), Muslim males are frequently depicted as breadwinners, householders, work hands, or victims in Central Asia.

During the Soviet period, women's work employment standards were regulated, and the promotion carried the idealization of women's workforce in every working field, even physically obligated (Kandiyoti, 2007). Nowadays, in some Central Asian countries, exists its rhetoric, where men oppress women's needs and wishes by referring to the local cult of domestic life. In Kazakhstan's society, "work for men" and "work for women" affects both gender groups. The discrimination factor of female mine workers is a masculine type of work, where being feminine is considered a bad qualification (Behzadi, 2019).

Kazakhstan's labor system aims to create a more gender-sensitive society by creating a legislative environment for local stakeholders (Buribayev & Khamzina, 2019). During the Interwar Years in 1923-1940, Kazakhstani women participated in the construction or mining industry in case of near location sites. Women accounted for 41 percent of personnel in concentration factories at the Altaipolimetall enterprises (Baker, 1985). Women's role models during Soviet times used to correlate between emancipation and traditions. However, during Kazakhstan's thirty years of independence, traditional values tended to outweigh emancipation due to religion, stereotypes, and gender segregation. For example, a tradition of Bride Kidnapping has been gaining in popularity for the past decades (Werner, 2018).

The emancipation of women and traditional culture have constantly confronted Kazakhstan's hierarchy. Nevertheless, Kazakhstan is officially a secular State. Soviet inheritance of obligated secularization and influence control of Islam built a specific environment in Kazakh society. Thereby, induced in re-Islamization of men and women for many decades by Soviet transformation that was anti-religious (Baker, 1985). According to Sultangaliyeva (2015), modification of Islam nowadays resulted in a more tranquil system than other Islamic countries worldwide. The new Islamic piety returned to the traditional path, where women were subservient, hence the opposite condition to the Soviet hierarchal system. However, women have new roles to express in the religious area and be empowered. Classes of the Islamic religion are made for women to help improve the new environment for the female religious community, but they are still limited in many areas. Collaboration of Soviet and traditional

religious systems resulted in a new Kazakhstan cultural system, which has taken both features to express. To prove, Kohut and Bell (2013) indicate respectful regard to women by Kazakhstani Muslims compared to other countries, where the degree of mistreatment is high. For example, Kazakhstan has a low grade of subordination support (51 percent). In contrast, countries such as Iraq (92 percent), Tajikistan (89 percent), and Uzbekistan (84 percent) have a high rate of support for women's obedience.

2.5 Women in mining engineering - misperceptions and stereotypes

The traditional stereotype about women in mining labor regarding little contribution to the industry, women's work being neglected and/or diminished (Lahiri-Dutt, 2017).

Sheriffs and McKee (1957) defined the conventional social view of men pictures as a set of characteristics: unconstrained behavior, competence, and wisdom. Meanwhile, women are categorized as supporting, empathetic, and communicative (Goffman, 1979). However, the negative side was also mentioned; for men, it is insolence, rudeness, being authoritarian, pride, and unnecessary rationality. For women, it is "submissive and dependent" (Kinnaird, Kothari, & Hall, 1994). Nevertheless, masculine characteristics are more positively accepted rather than feminine. According to Park et al. (2019), male workers believe that the success of female employees is luck or many working hours, and it feeds the biased attribute of stereotypes. Stereotypes based on prejudice, such as women are "humble, communicative, and caring" and ready to volunteer for the less valuable job, these biases put women into losing positions. Often supervisors delegate female employees with specific tasks based on the belief that women are better in event organization, for example.

Challenging stereotypes is still the main goal for women in this area. Due to that, female stakeholders work harder to prove their rights in particular work positions (Henderson, Stackman, & Koh, 2013). Mining companies' laws and policies could reflect the negative gender pattern to decrease female participation in decision-making and/or working processes. In large-scale mines with international company administration, the women's status is secured by company policies. However, in small-scale mines, the females experience the negative effect of masculine impact, which might flow into unfairness.

Nevertheless, such practices do not define every case of possible gender discrimination, and there are still large companies that use the concept of inclusivity to hide and maintain the status quo with the face of progressive ideology (Macdonald, 2017). Laplonge (2016) reviewed the

common behavior of women in the mining sector. In most cases, women tend to behave more masculinely while working because of fear of rejection by male co-workers. Outdated stereotypes of how women do not fit into the mining industry still affect the recruitment policies of the mining companies. One of the reasons is the physical abilities of a female candidate, however, it is not always the case or could be irrelevant (Park et al., 2019).

Williams, Kilanski, and Muller (2014) provided a case example of misogynistic patterns, i.e., how women could be inadvertently biased toward other women. Female managers regularly selected male workers on promotion to avoid the possible appearance of gender unfairness in favor of female co-workers. Authors claim that women workers have to prove their objectiveness in such conditions by promoting a male employee. Consequently, interviewed women supported having more women on board and giving more opportunities for the female part of the team. However, most of them would not abide company's preferences where their position could be jeopardized.

2.6 Benefits of gender diversity

According to Hunt, Layton, and Prince (2015) in the publication "Diversity matters," companies where the gender diversity index is high, are most likely to achieve 15 percent higher profit of financial returns than other companies. Based on this report, research studies show that total income is more significant in companies with CEO women and has more considerable social success. The top 100 mining companies in the industry have a more significant number of female personnel in leading positions, meanwhile in 100-500 of the largest mining companies percent of women in senior positions is higher than in large mining enterprises that are not in the top 500 (Dawson, Kersley, & Natella, 2016). Economics (2016) also stated that having women in senior positions with decision-making ability positively impacts the company, i.e., high rate of capital return, investment, and sale income. Studies show that mining companies with a more extensive number of female stakeholders in a working team and diverse, friendly firms have better performance in communication, creativity in involving innovative ideas, and resolving technical and business issues related to the working process (Park et al., 2019).

According to Park et al. (2019), male workers usually prefer working with men. Meanwhile, women are willing to work in teams and communicate to organize and solve upcoming problems. Diverse teams tend to perform better than homogenized working teams with more strict and narrow opinions. In the case of female stakeholders in managing position, who could

double or triple her income by working in the mining sphere yet gives broader opportunity to buy her children and family members needed supply for school, provide better education, and medicine. Thus, the poverty rate decreases in women's community, and families profit with a better living standard. From the economic perspective of the country, increasing citizens' income benefits the GDP rate growth; therefore, the mining industry is a highly profitable area. With women onboard, mining companies tend to care about the environment and social problems more; hence diverse working team has a broader view with different viewpoints on the development of mining operation. Kireyeva and Satybaldin (2019) also stated that reconsidering the current state of women in labor could lead to socio-economic growth and accomplishing the development of sustainable areas, i.e., resolving cultural stately, social progress, ethnic matters.

According to Rick, Martén, and Von Lonski (2017), the wider possibility to recruit a wider talented working pool is one of the positive sides of the diversity policy of the mining company. Gender neutrality in the recruitment process helps with providing an opportunity for everyone to apply. Mining companies that limit and focus on men-only hiring provide for themselves a poor working pool compared to companies seeking inclusivity. Park et al. (2019) observed the case of the extreme shortage of oil company stakeholders in recent years, and it cost 60 percent of employees termination. Not only were they the primary labor force, but it also took half a year to fill the jobs with new workers. It brings to the point that dynamic retaining and attracting women could help respond to the demand for a limited number of potential workers. Additionally to the present stakeholder shortage, the aging of present employees could cause a lack of human recourse in the mining industry.

According to Alshanskaya (2020), in terms of gender equality, Kazakhstan is a party to international treaties and has incorporated international standards into its legislation. Kazakhstan, for example, has ratified the Convention on the Elimination of All Forms of Discrimination Against Women, the Beijing Declaration and Platform for Action, and the 2030 Agenda for Sustainable Development. Currently, the Republic of Kazakhstan's gender policy evolution may be found in Kazakhstan's Concept of Gender and Family Policy until 2030.

CHAPTER 3

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Scope

This thesis is focused on reviewing analyzing gender issues in the mining industry of Kazakhstan and providing recommendations to the mining companies to pursue increasing gender diversity. Achieving international human rights standards is vital for every industry but more so in mining, where women represent a small minority. We conducted a study of the literature on gender issues in mining jobs, particularly those in mining engineering, to understand the dynamics of occupation-related gender imbalance.

Exploratory analysis was performed on the qualitative and quantitative data to extract relevant statistics. Descriptive analysis was presented to compare the state of women in various branches of the economy of Kazakhstan. Content analysis was conducted on news publications of Kazakhstani mining companies.

3.1.1 First stage

The project required data resources of the current gender gap in Kazakhstan's mining companies. To complete this task successfully, the following steps were undertaken:

- Literature review of current gender issues in the international mining industry.
- Review of literature on gender diversity impact on mining companies.
- Definition of key barriers to gender inclusivity in the mining industry.
- Review of mining companies' gender diversity policies and their implementations worldwide.

3.1.2 Second stage

The second stage of the thesis research included:

- Collecting quantitative gender data from Kazakhstan's official statistical sources.
- Provide descriptive statistical analysis on the current state of women's presence in the mining industry of Kazakhstan.
- Collecting and analysis of qualitative data on gender issues in Kazakhstan's mining industry.

3.1.3 Third stage

The third step consisted of formulating conclusions and suggestions to mining companies and the government based on the quantitative and qualitative research of gender issues in the mining industry of Kazakhstan.

3.2 Data acquisition

This thesis used quantitative data from annual publications “Men and Women of Kazakhstan” for descriptive analysis. This publication is issued by the official government agency Bureau of National Statistics under the Agency for Strategic Planning and Reforms, a department with the Ministry of National Economy of the Republic of Kazakhstan.

For qualitative analysis, we collected information on well-known large and medium-sized enterprises in Kazakhstan, i.e., KAZ Minerals, Kazzinc, Kazakhmys, ERG (Eurasian Resources Group), and Polymetal. Official company web pages and social media posts that are publicly available are used as the target of review. As the information on official company sources may be edited to present the company in the best light, such information may be biased. However, analysis of personal or other social media sources that do not represent official company information is beyond the scope of our work.

3.3 Data collection and processing

3.3.1 Data analysis

Graph tables in MS Excel were used to extract pertinent summary statistics from the quantitative data. We thematically identified the main gender parity indicators in the mining industry of Kazakhstan. The databook comprised different sections and sub-sections that described employment and the ratio of men and women in certain branches. The data cover all regions of Kazakhstan, and according to The Labor Code of the Republic of Kazakhstan, persons of working age including citizens aged 16-59.5 years women, 16-63 years men. The pay rate section determines the average monthly nominal salary per employee by dividing the accrued salary fund by the actual number of employees and the number of months in the reporting period. The education section consists of schools, gymnasiums, and lyceums (public education organizations) implementing basic and additional general education programs. Scientific organizations and higher educational institutions carry out the scientific and pedagogical personnel of higher qualification with bachelor, master's, postgraduate, and

doctoral programs. Postgraduate education is the main form of training highly qualified scientific and pedagogical personnel - master's students, candidates (doctors) of sciences, and Doctor of Philosophy (Ph.D.).

The transcribed text via news publications and Instagram posts was read for qualitative analysis to obtain existing trends in Kazakhstan's mining industry. Content of the mining companies' Internet resources was analyzed using 'resource,' 'personal experience,' 'subjective opinion and interest' categories. *Resource* category could be or could not be factual and contain news, information, and updates. The *personal experience* category addresses direct (personal) or indirect (e.g., friend, family, co-worker) experience in the mining industry. In the *subjective opinion and interest* category section, female employees express their opinions on the mining sector or discuss the need to discover the issue.

The categories consist of meaning units and code words. Meaning units, in our case, are factors women employees experience, and code words succinctly represent the condensed meaning unit and serve as tools to analyze the data. Meaning units are initial adjustment, work process, benefits, barriers, type of occupation, relation with colleagues, family influence. In our case, the content analysis is a tool to examine the presence, meaning, and correlations of female presence in the public news of the mining companies. The major themes were found through a thorough content analysis highlighting recurrent modal terms.

4. RESULTS

4.1 Quantitative analysis

4.1.1 Employment

The men's and women's employment in 2008 and 2020 is presented in Table 6. In 2020 the number of women in the mining industry was 57.8 thousand, and in 2008, the number of women in mining was 51.3. Thus, the number of women in the industry has increased by 12.7 percent over 12 years. However, the number of men in the same years has risen to 47 percent, which shows that the mining industry has grown, but gender parity has not. In all industries, the increase of women from 2008 to 2020 was 10.2 percent, and the growth of men was 19.1 percent; hence this shows similar agenda to the mining industry in women relations. Considering all sectors by the 12 years, Kazakhstan's number of workers has risen for 9.7 percent of women and 12.5 percent of men.

Table 1. The number of employees in large and medium-sized enterprises by type of economic activity (thousands of people).

	2008		2020	
	women	men	women	men
Thousands of people				
All sectors	3,839.50	4,017.70	4,212.50	4,519.50
Industry	313.8	624.3	345.7	743.5
Mining and quarrying	51.3	149	57.8	219.1

Fig. 5 represents women's presence in different fields by the ratio of women to men employed. This graph shows the significant difference between the number of women employed in All sectors and the Mining industry. In All sectors, women's participation is closed to 45-50 percent through years. Over the long term, the share of women in total employment across All sectors remained unchanged. However, there is a decreasing trend for women's share in total employment in Mining and quarrying. In 2020, women's share was the lowest at 19.2 percent.

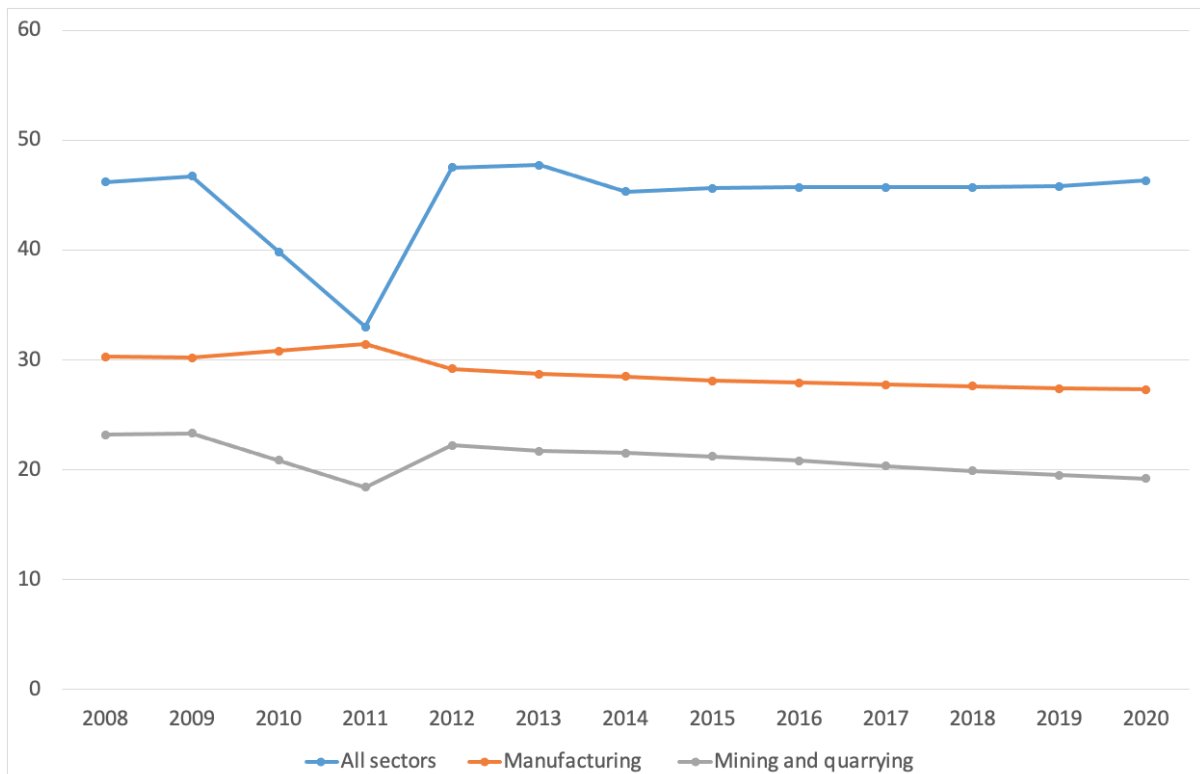


Figure 1. The ratio of women employed to men employed, percent of total

4.1.2 Pay gap

According to the data, the gender pay gap in the mining sector in 2008 was higher than in 2020. In 2008 women received 70% of the level of men’s mining salaries, while in 2020, women received 83% of the level of men’s mining salaries

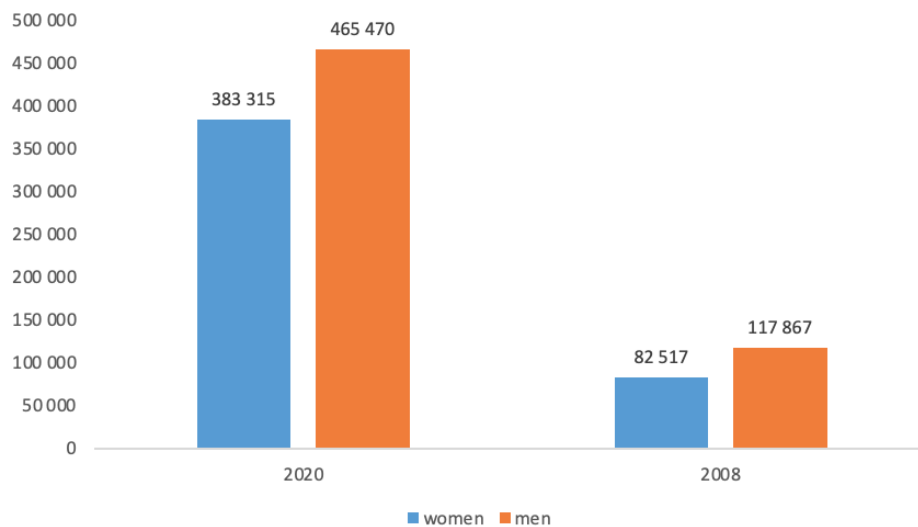


Figure 2. Differences between men and women nominal monthly wages in KZT

Occupation in the mining sector is highly paid, according to Fig. 9. On the graph, the ratio of women's wages to men's wages in percentage indicated that gender pay gap in Mining and quarrying sector of Kazakhstan is less compared to All sectors and Manufacturing. The indicator of the pay gap in 2012 was similar in three compared sectors; however, Mining and quarrying sector has steady growth while All sectors and Manufacturing has a slight increase.

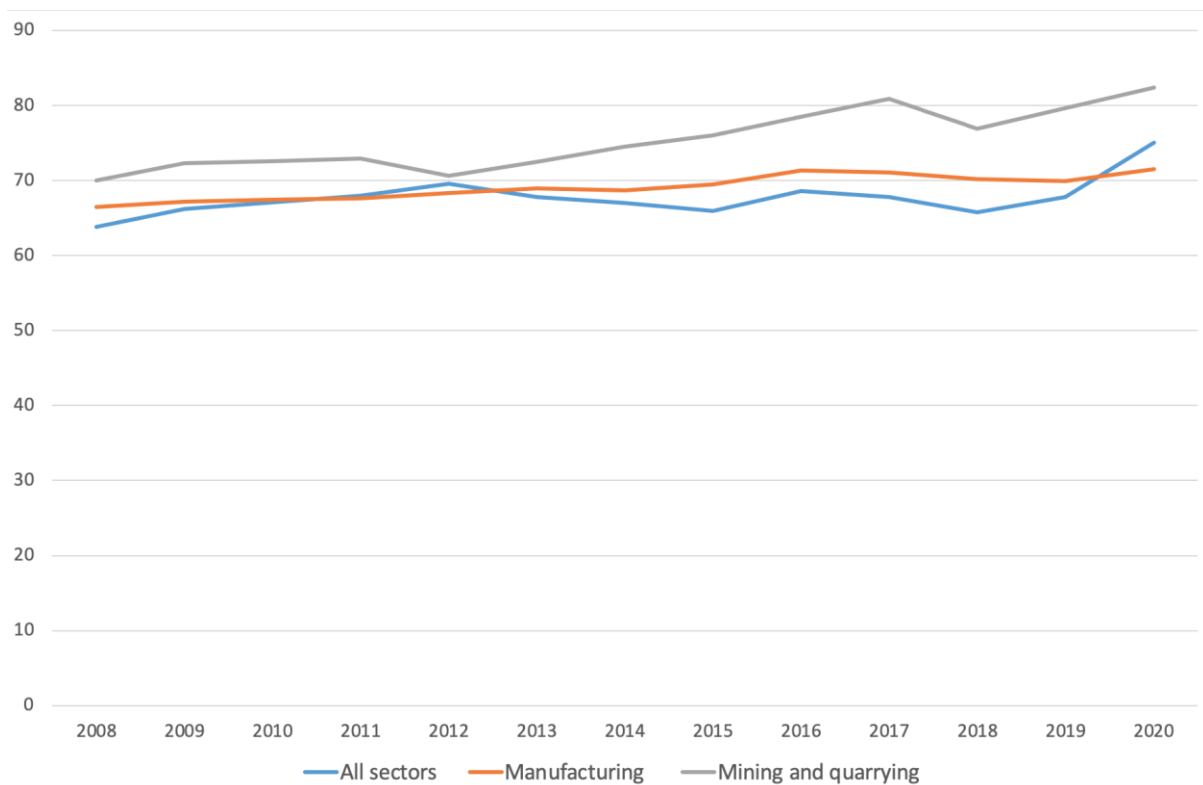


Figure 3. Average monthly nominal wages the ratio of women to men by the type of economic activity

Since most mining companies tend to be large, we compare the pay gap in a subset of large and medium-sized enterprises across sectors. As shown in Fig. 10, the Mining and quarrying sector is still leading with the lowest pay gap compared to other sectors.

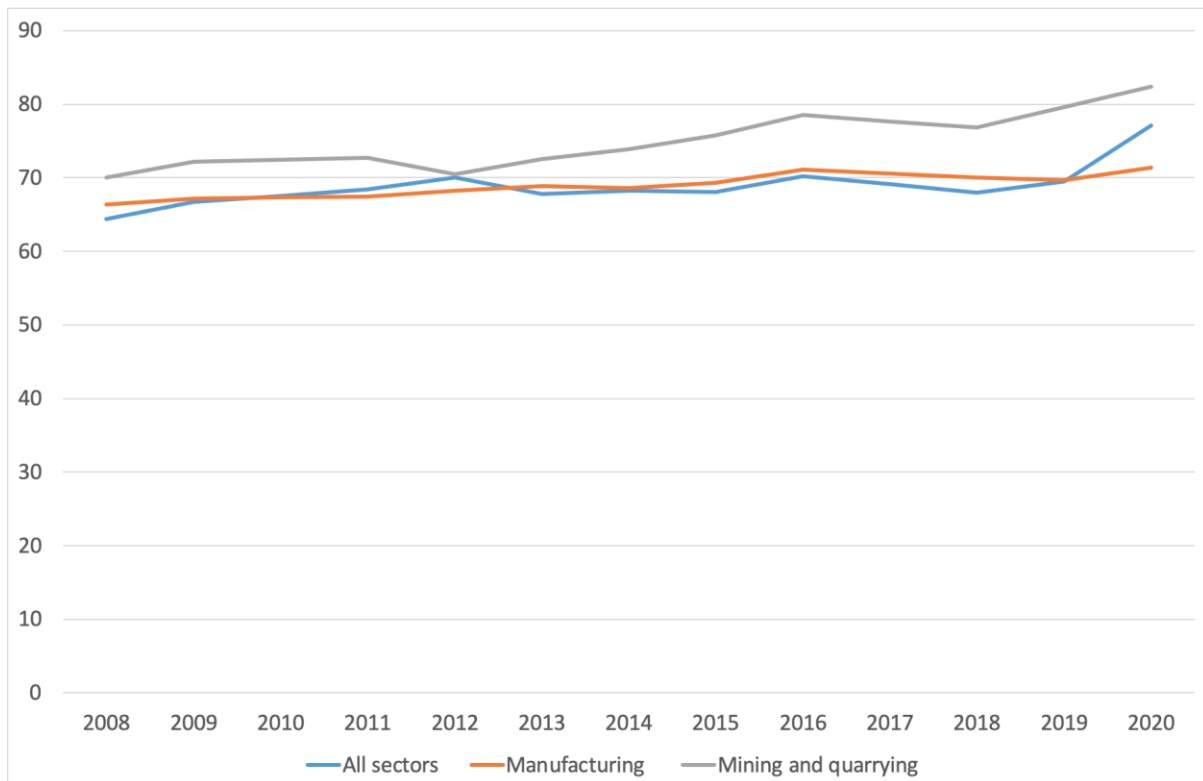


Figure 4. The ratio of women's wages to men's wages in large and medium-sized enterprises, in percentage

4.1.3 Education

The graphs below represent patterns and tendencies in women's education in Kazakhstan. In Fig. 11, graphs show that more women men have Basic IT skills, E-mail and internet use skills, and Programming and other advanced IT skills. Thus, the lack of computer skills argument is irrelevant for women's employment in mining.

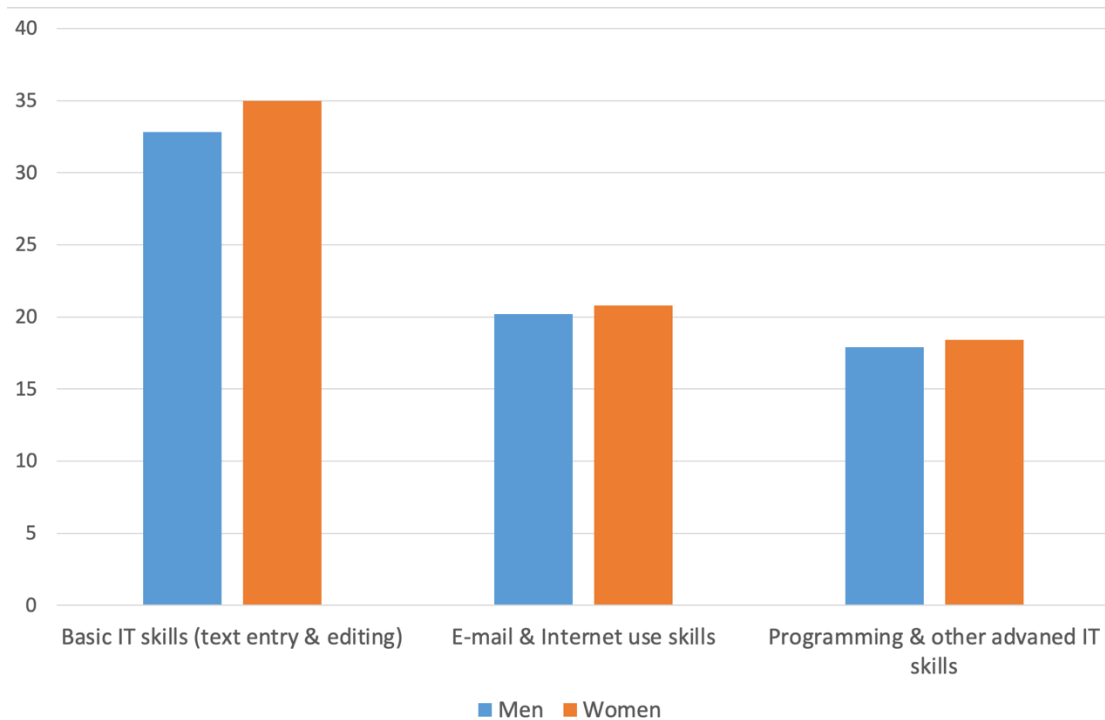


Figure 5. IT skills by gender in 2020, percent of total individuals

In Fig. 12, the share of women on different educational levels shows that the ratio of female students in Primary and Secondary education was close to 50 percent and stable over 17 years. Meanwhile, in Higher education number of female students was changing; the lowest point was in 2019, 50.2 percent. Still, women's presence was higher than men's. In 2009 share of women studying higher education was 58.3 percent, which was a peak point. From 2012 the slight decrease of women higher institutions is present in Fig.12.

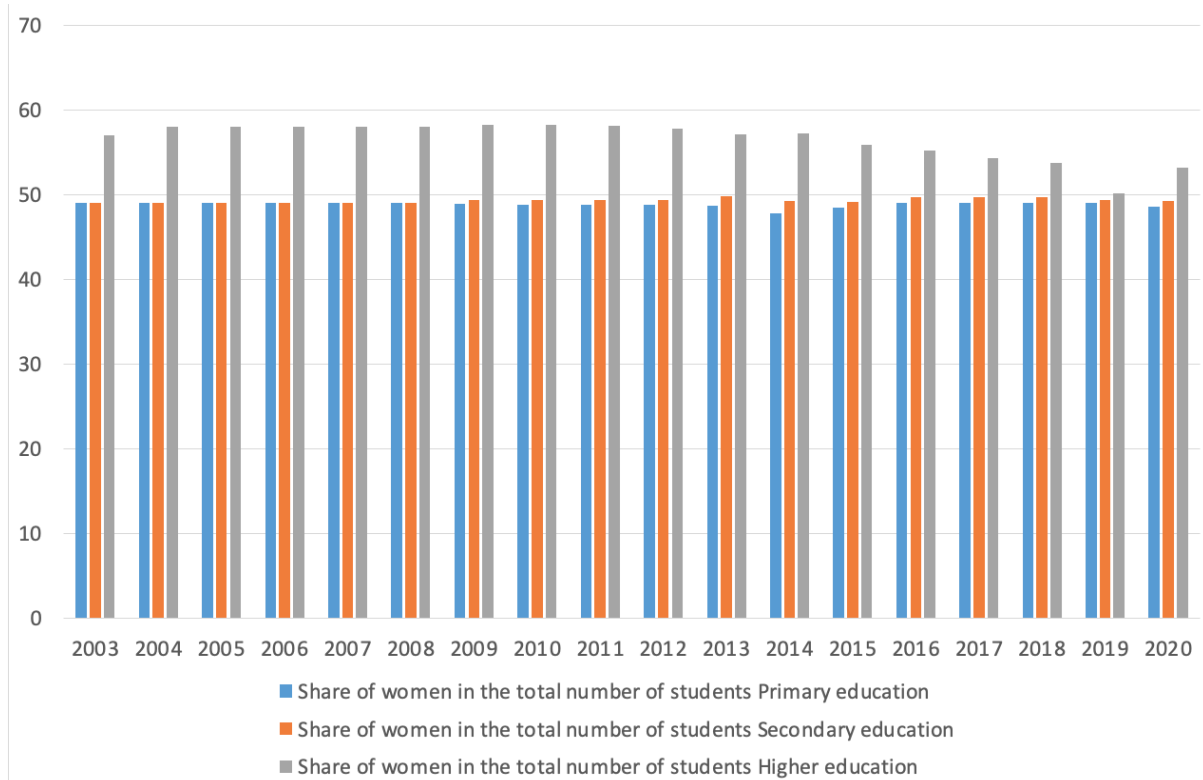


Figure 6. Share of women in the total number of students, in percentage

According to the findings, female students tend to get bachelor's and masters' degree. At the same time, male students tend to prefer Secondary education to their career as soon as possible. The share of women studying technical and vocational education (Secondary education) from 2008 to 2020 is presented in Fig. 13.

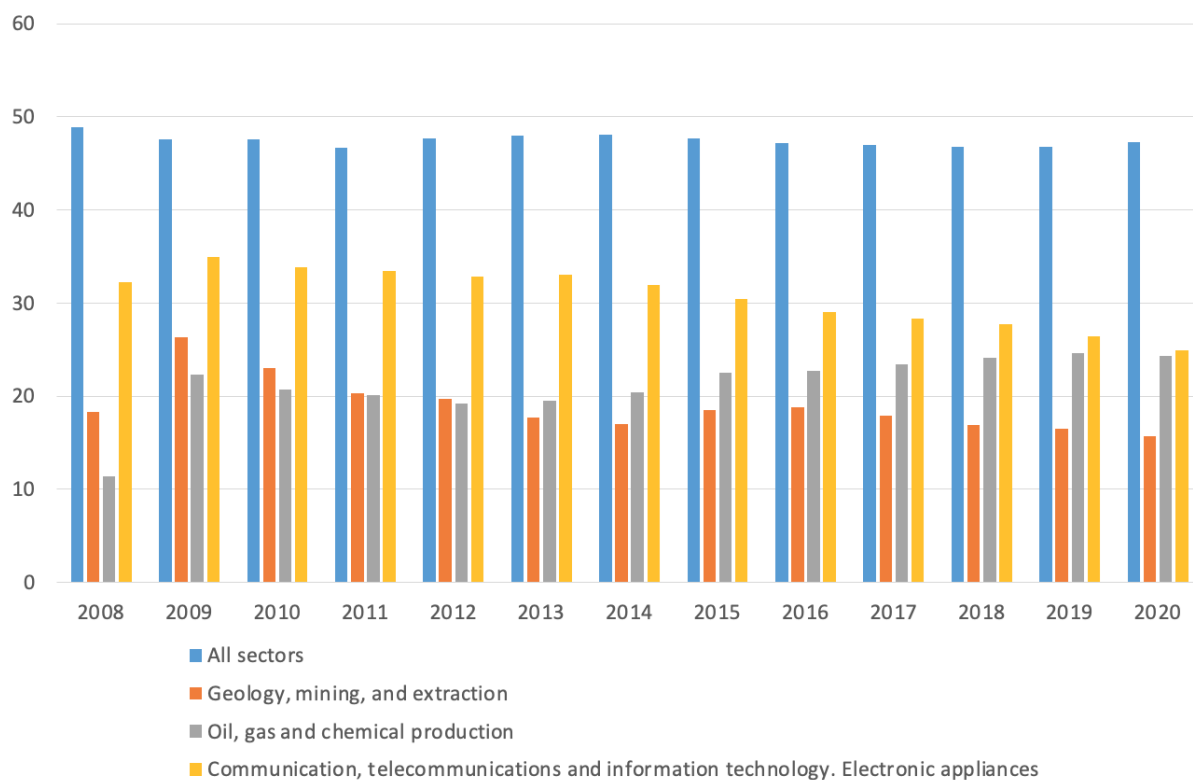


Figure 7. Share of women in organizations of Secondary education, in percentage

At the Secondary education level in 2020 (Fig.14), female students' presence was 47.3 percent in All sectors and 15.7 percent in Geology, mining, and extraction sector. In Oil, gas, and chemical production, women's presence is 24.3 percent out of all students (male and female).

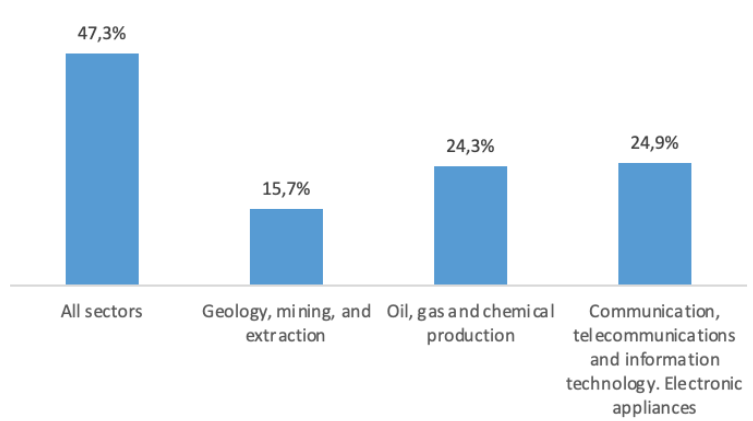


Figure 8. Students in organizations of technical and vocational education by groups of specialties

Higher education in Kazakhstan is quite popular among women. Fig.15 shows that the average female share in the All sectors is 56.2 percent. Natural Sciences, Mathematics, and Statistics have the highest rate of female presence. For example, in 2019 share of women students was

71.2 percent; however, in 2013, the outlier point of 28.8 percent exists. On average, the Engineering, manufacturing, and construction sectors have 29.2 percent of female students. According to the databook, in 2009, these sectors had zero percent of women due to unknown circumstances. Around that time, universities in Kazakhstan allowed only male students in Mining Engineering educational programs. In application requirements, ‘male only’ was prescribed.

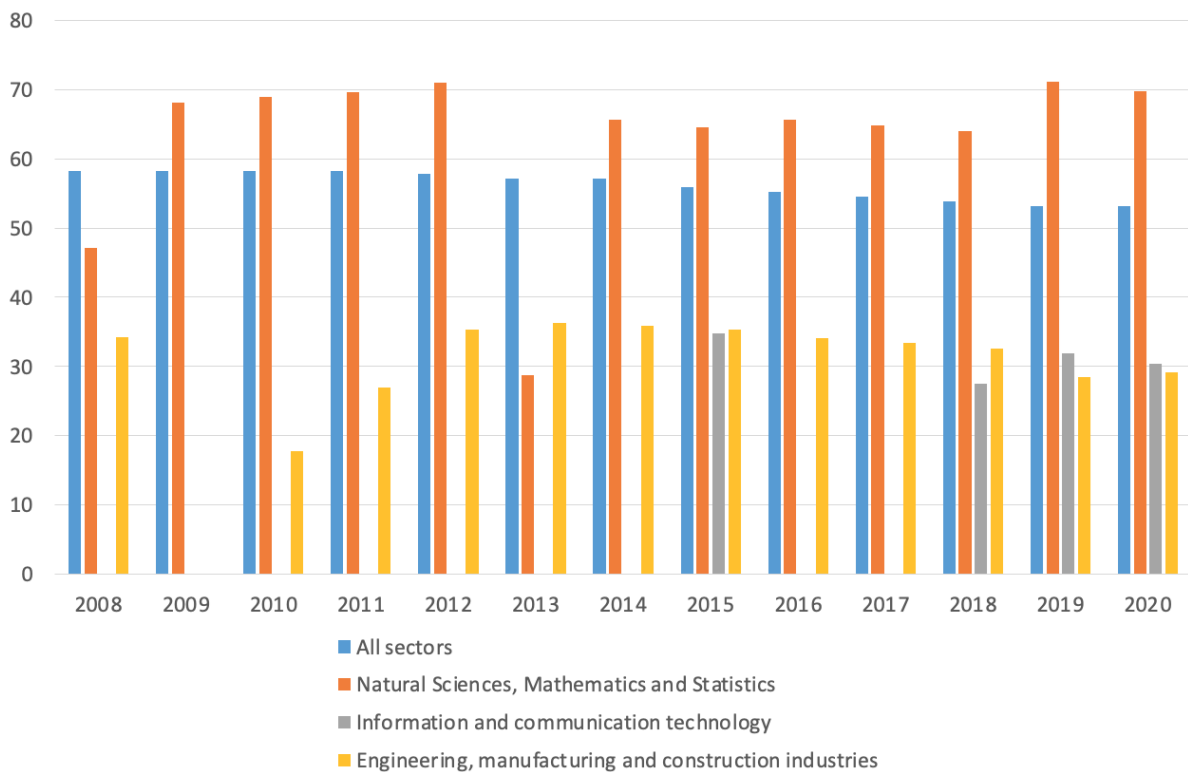


Figure 9. Share of women in the total number of students in higher educational institutions in percentage

Fig. 16 provides that on graduate programs share of women in All sectors on the average is 61.5 percent across 12 years. In 2011 female master students had the highest rate, 65.4 percent, in All sectors. As in undergraduate programs, Natural Sciences, Mathematics, and Statistics sectors have the biggest number of women doing master’s program. On average, female students account for as much as 70.1 percent of the total number of students in these sectors. In Engineering, manufacturing, and construction industries, female students have more prominent indicators than in Secondary education and undergraduate program. On average, women's presence in these sectors is around 45.3 percent across 12 years. The reasons for such rise up could be a lower number of male students and specialty switch of several female students.

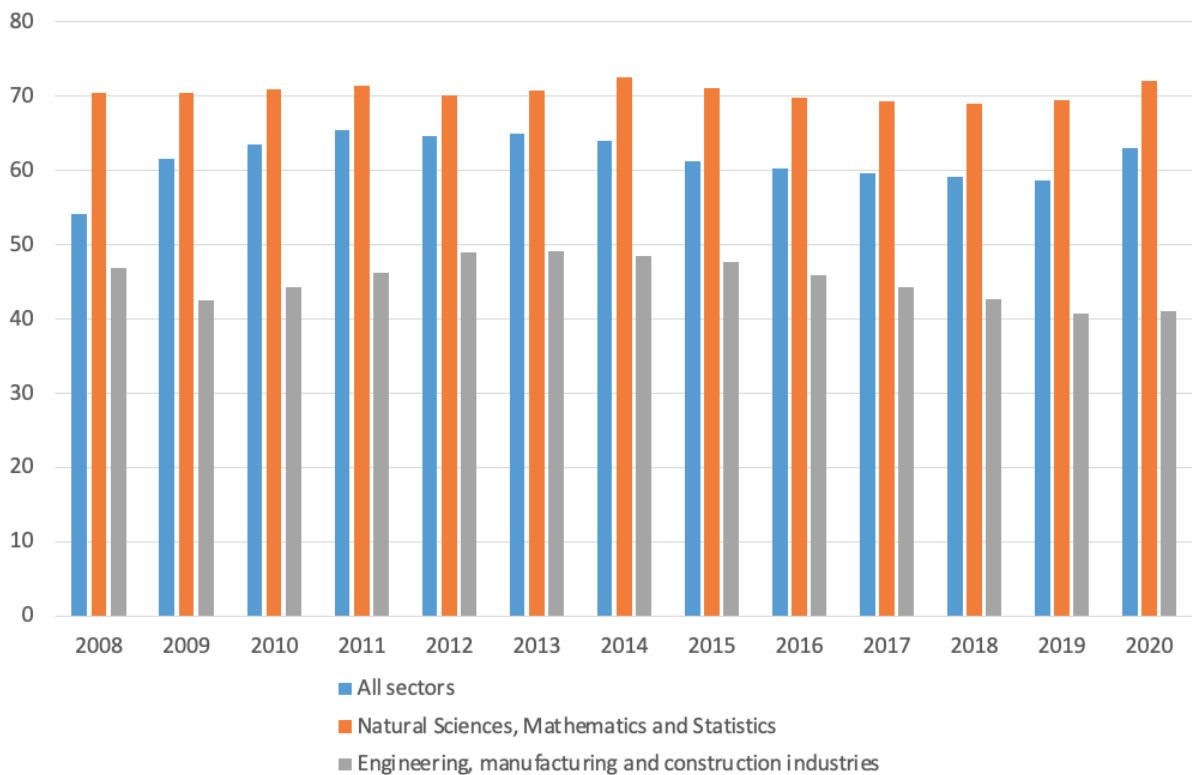


Figure 10. Share of women in the total number of master students

4.1.4 Discussion

The employment section shows a low and decreasing number of female workers engaged in the mining sector. This condition may be due to several reasons initially discussed. Mining companies tend to employ male personnel rather than females because of prejudice, outdated stereotypes, marital status, and potential maternity leave. The gender pay gap could also be one of the reasons which are still present because

- The majority of manual-intensive labor occupy men
- Women commonly work on managing positions
- Lack of women in the decision-making process
- Glass-ceiling
- Underrepresentation of women in mining sector/unfavorable labor

Nevertheless, the gender pay gap in the mining sector of Kazakhstan is decreasing.

The government supports secondary education, undergraduate, and graduate programs in Kazakhstan through grants and exchange programs like Bolashak. In addition, many large and medium-sized enterprises also provide potential employees with grants and stipends.

According to the graphs, the educational trends showed that most female students in specialized secondary education, undergraduate programs, and graduate programs prefer more Natural Sciences, Mathematics, and Statistics than a specialty in the Engineering, manufacturing, and construction industries. In many cases, after obtaining the engineering degree, women were willing to make a career switch in favor of more “protected” areas, i.e., accounting, home economics, medicine, science and education, and beauty.

4.1.5 Summary

Statistical analysis shows the actual data on women and men in Kazakhstan. From 2008 to 2020, the involvement of women in mining has had minor changes, except the gender pay gap. The gender pay gap in the mining sector decreased, which is a positive development. The share of female employment in mining decreased from 23.3 percent in 2008 to 19.2 percent in 2020, resulting in 4.1 percent. Mining companies on official web sources claim that gender diversity improved by years; however, according to statistical data, it lowered. Based on graphs, women favor higher education in traditionally feminine labor. Even though the number of scholarships in the engineering area increases from year to year, women tend to prefer other educational sectors. Overall, the mining sector has a negative pattern in terms of employment and education.

4.2 Qualitative content analysis

4.2.1 KAZ Minerals

KAZ Minerals is one of Kazakhstan's most efficient and fast-growing copper mining companies. According to Forbes, in 2021, KAZ Minerals has risen to first place in the ranking of the largest private companies in Kazakhstan. In 2020, the company produced 306,000 tons of copper, resulting in a cumulative 30 percent annual increase in production from 2015 to 2020. According to the Randstad Employer Brand Research (2021) study, KAZ Minerals is in sixth place in the top 10 most attractive out of the 150 largest employers in Kazakhstan.

On the official website, KAZ Minerals mining company has two publications where code words 'women', 'women in mining, and 'female employees' occur.

Resource category

'Environmental and Social Policy' section of the company strategy stipulated that women should make 19 percent of the general company workforce and 25 percent of the Board of Directors. Compared to other Kazakhstani mining companies, these targets are high. The company is consolidating itself as inclusive and supportive towards its workers. The company creates essential work and safe environmental conditions, thus having high demand from potential employees and being well-liked by ordinary citizens in the region. Local expertise is the company's priority as it supports local communities and provides job opportunities. KAZ Minerals provide up to three years of maternity or paternity leave and revision training for employees returning from such withdrawal. The official source Equality & Diversity (2020) states that the company controls employees' salaries for pay equity for the same work positions to avoid gender pay disparities. The company has around three thousand female employees. Those who work in physically obligated positions are 57 percent of the total, 57 percent are married, and 64 percent have children.

Personal experience category

Web publications of the company Equality & Diversity (2020) and Women in Mining (2020) inform that three female employees in senior positions at KAZ Minerals Group were included in the 2018 and 2020 list of "100 Inspirational Women in the Mining Industry of the World." Two of them currently work in geological and hydrogeological directions for many years. Another woman worker has a position on the decision-making board. All three have worked in academia and being valued by the company.

Subjective opinion and interest category

In the interview, one of the female employees states that there is no difference between men and women in intellectual ability and potential. In addition, other female worker shares that equality in the mining industry is moving in a positive direction. She believes that today in the mining industry, at any level, there are no restrictions based on gender, age, nationality, or skin color and KAZ Minerals demonstrates that. The third female worker in senior position claims that the biggest issue of the mining industry is the lack of narrow specialists, and it is vital to raise the profile of working in the mine. As the main barrier, KAZ Minerals women indicate fear of responsibility at the beginning of their careers. Family members influenced one out of three women in mining to work in the industry. Three of these women have successful careers and have worked in academia.

Results

Table 2. The number of meaning units and frequency categorized using code words in KAZ Minerals company's content

Meaning units	Category	No. of publication	No. of meaning units	Code words	Frequency
Initial adjustment	personal experience category	2	2	women, women in mining, female employees	100%
Work process	personal experience category	2	2		100%
Benefits	resource	2	2		100%
Barriers	subjective opinion and interest	2	1		50%
Manual type of occupation	personal experience category	2	1		50%
Office type of occupation	personal experience category	2	2		100%

Relation with colleagues	personal experience category	2	0		0%
Family influence	personal experience category	2	1		50%

Discussion

By evaluating two publications, 11 meaning units were detected. Female employees, according to frequency, mostly share about initial adjustment and work process. The company writes more about benefits and social support. Resource category shows that KAZ Minerals is popular around the working pool due to its corporate policy. The Group has a diverse and protected working environment for both genders. According to the Randstad Employer Brand Research findings, potential workers are attracted by a good reputation, financial stability, job security, good pay, pleasant working environment, social responsibility, and career opportunity.

4.2.2 Kazzinc

Kazakhstani company Kazzinc is a big integrated zinc producer with a large share of related production of copper, precious metals, and lead. Swiss company Glencore International has been a general investor of Kazzinc company since 1997. Kazzinc takes an active part in the social and economic development of the regions where the Company's subdivisions are present. It finances projects in healthcare, education, sports, and culture, invests in infrastructure development, and supports socially vulnerable groups in Ust-Kamenogorsk, Kokshetau, Altay, Ridder, and the village of Zhairam.

On the official web source Instagram [@kazzinc_official], Kazzinc mining company has 20 out of 1,334 news publications where code words ‘women’, ‘women in mining, and ‘female employees’ occur.

Resource category

Over 20,000 people work in the Kazzinc mining company, representing more than 500 different professions. However, the company does not share information about the number of men and women employed, the percentage of those who have children, and their marital status. The local community values the company due to activism and financial support. Kazzinc provides

hospitals, schools, and other socially essential organizations with voluntary and monetary care, according to social media publications. The company also organizes various events and award ceremonies for the employees. In the personnel development section, the typical Kazzinc worker is described as a married man under forty years old with 1-2 children, specialized secondary and/or higher education, and works as a smelter, machinist, or drifter. The company provides talented workers with a higher degree or education courses with full or partial funding. Nevertheless, according to its social media, Kazzinc company devotes attention to successful and hard-working women employees.

Personal experience category

On Instagram account, the company informs that six female workers have been awarded for ‘Labor distinction,’ ‘Labor veteran,’ and ‘Presidential Medal.’ These women have worked for the company for more than twenty-three years, and three of them are in senior positions. They share personal experiences in a positive way, saying how supportive the administration and colleagues are, but they do not mention social support from the company. Some younger specialists started their careers recently and encouraged other potential workers to consider Kazzinc as a place to start the professional path. Women workers also highlight the significance of team solidarity and a healthy working environment. The more experienced employees support youth and help them go up the career ladder. Another publication is about the worker who is the only female machine operator on the lead-zinc plant. With over forty years of working experience, she became very skilled in the profession. She adds that the machine operator job is physically demanding and requires deep knowledge of this craft. One woman was provided with her apartment due to difficult life circumstances.

Subjective opinion and interest category

Experienced female employees with a background of many years shared how they endured difficult times during the beginning of their careers. Some of them remember proving their competency to supervisors and co-workers through effort and hard work. The personal experience of several women was not accessible due to different barriers, such as lack of trust from co-workers, hard labor, uninteresting and routine work, and high demands on themselves. However, they state that it is temporary, and genuine professionals will succeed by undertaking.

Results

Table 3. The number of meaning units and frequency categorized using code words in Kazzinc company's content

Meaning units	Category	No. of publication	No. of meaning units	Code words	Frequency
Initial adjustment	personal experience category	20	16	women, women in mining, female employees	80%
Work process	personal experience category	20	11		55%
Benefits	resource	20	9		45%
Barriers	subjective opinion and interest	20	5		25%
Manual type of occupation	personal experience category	20	7		35%
Office type of occupation	personal experience category	20	7		35%
Relation with colleagues	personal experience category	20	16		80%
Family influence	personal experience category	20	7		35%

Discussion

The majority of interviewed women workers at Kazzinc company share the beginning of their career and their relationship with colleagues. Women employees in this company are likely to share about personal life, not work-related conditions. Meanwhile, Kazzinc takes a niche of social support company that prioritizes volunteering and helping marginalized groups. Thus,

the company is valued among the local community and mine workers. However, Kazzinc is not regarded as a top company due to the average salaries and medium working conditions. The company needs improvement and implementation of diversity strategy to meet high standards.

4.2.3 Kazakhmys

Kazakhmys is a vertically integrated industrial group with key mining and non-ferrous metallurgy assets. Kazakhmys' enterprises consist of mines, enrichment plants, copper smelters and are located at three production sites in Balkhash, Zhezkazgan, and Karaganda, where about 37,000 people work. According to Forbes, the company ranked among the top 5 most extensive in the sector and took fifth place in Most Attractive Employers 2015, Engineering/Natural Sciences Category. According to the official website, in 2020, the contribution of the Kazakhmys Group allowed the Republic of Kazakhstan to take 11th place in the world ranking of silver producing countries, 279 tons, 51 percent of the total production in the country.

Kazakhmys company delivers news and updates through an official web page [www.kazakhmys.kz] and Instagram account [[@kazakhmys_official](https://www.instagram.com/kazakhmys_official)]. On Instagram social media, out of 343 posts, ten are about women employees.

Resource category

Kazakhmys' annual review of wages and social package helps maintain the Company's competitiveness in retaining and motivating employees. Recently, the company has been increasing the salaries of all employees by an average of 30-35 percent. Social support is provided in health insurance for employees and employees' families. Kazakhmys also donated 45 apartments to workers' families with many children in the Karaganda region (Atameken Business, 2021). The company tended to the Green Economy strategy and began constructing its renewable energy facilities. As Kazzinc, Kazakhmys does not share the information about the number of female workers and family status of employees. In addition, on official sources, publications are about individual stories of women in mining.

Personal experience category

In social media sources, Kazakhmys provides information about forty-two female employees. Thirty-four of these women were awarded by trade unions and supervisors. One of the women employees has worked at the company for 40 years as a conveyor machinist. She shares her

experience in her career positively and acknowledges her supervisor. Choice of occupation for most women employees in Kazakhmys refers to several factors, such as family history, location of the workplace, educational access in the area.

Subjective opinion and interest category

Women employees describe Kazakhmys as a company that created an environment where women can be productive. Female workers mostly share the history of their career, factors that led to work in the industry, and attraction to a specific company. Some interviewed women shared barriers experienced while working in the industry, and primary is forcing them to be masculine on the manual job, high standards, and lack of experience. A female worker's skimmer at a concentration plant shared that more than fifty percent of similar workers are women. She adds that women in this occupation are more productive, responsible, diligent, and neat. In addition, she expressed her admiration to female colleagues; thus, her excellent work earned her the esteem of co-workers.

Results

Table 4. The number of meaning units and frequency categorized using code words in Kazakhmys company's content

Meaning units	Category	No. of publication	No. of meaning units	Code words	Frequency
Initial adjustment	personal experience category	10	8	women, women in mining, female employees	80%
Work process	personal experience category	10	8		80%
Benefits	resource	10	6		60%
Barriers	subjective opinion and interest	10	3		30%
Manual type of occupation	personal experience category	10	6		60%

Office type of occupation	personal experience category	10	3		30%
Relation with colleagues	personal experience category	10	8		80%
Family influence	personal experience category	10	6		60%

Discussion

Kazakhmys is a highly supportive company towards their employees according to the content on their sources. On the official sources' presence of women, employees are more frequent than other mining companies of Kazakhstan. The Group is highly competitive in the labor market and has high standards in the employment process. Kazakhmys is one of the most attractive employers in the mining area because they interest qualified personnel by corporate policy, social packages, and high salaries. However, according to the content, the company's agenda does not include any gender diversity strategy.

4.2.4 Eurasian Resources Group

ERG is a leading diversified natural resources extraction and processing company. Most of the assets are located in Kazakhstan. ERG is the world leader in high-carbon ferrochrome production by chromium grade and one of the Eurasian region's largest iron ore and aluminum products suppliers. According to Forbes, Eurasian Resources Group is listed in Kazakhstan's top 50 most prominent private companies.

Out of 3,821 Instagram publications [@ergkazakhstan], 34 included code words 'women', 'women in mining,' and 'female employees.' On the website [www.erg.kz], four articles are dedicated to women in mining.

Resource category

On the official website, the company formulated the main aims of the corporate policy, which are safety, unity, efficiency, development, and responsibility. These are keys to effective, sustainable development, and the company has a long-established record of creating a positive

influence in communities via its community social investment (CSI) projects. According to Instagram publications, ERG donated sixty-four apartments to young employees with families. The company sponsors events to support women, such as an exhibition in Aksu dedicated to women engineers and miners. In 2019 a forum event about women in the mining industry, two hundred female workers with nine speakers discussed gender issues and stereotypes. ERG company supports the Green Economy Strategy, and women employees represent this unit. In addition, the Kazchrome division is recognized as one of the best enterprises creating conditions for working mothers.

Personal experience category

ERG provides information about forty-two female employees through social media sources. Twelve women employees were awarded letters of appreciation, one of them with a medal. ERG women workers shared their experiences in social media and website, but publications with personal stories and quotes are less than other companies' content. One of the speakers shared that only ten percent of women are in a top management position. Due to that company admits gender disparity.

Subjective opinion and interest category

On the league of professionals' forum dedicated to women in mining, speakers presented the current state of gender diversity. According to the company's content, the main barrier is stereotypes of women in mining. Speaker highlighted some of them, e.g., prejudices because of potential marital status and maternity leave; weak decision-making power, which is false because it depends on the person's abilities and approach; being a leader is for men, also false because this quality is not inherent in any particular gender. Participants of the league of professionals expressed the importance of such events and valued the support of the ERG company.

Results

Table 5. The number of meaning units and frequency categorized using code words in ERG company's content

Meaning units	Category	No. of publication	No. of meaning units	Code words	Frequency
Initial adjustment	personal experience category	34	8	women, women in mining,	23%

Work process	personal experience category	34	4	female employees	12%
Benefits	resource	34	15		44%
Barriers	subjective opinion and interest	34	1		3%
Manual type of occupation	personal experience category	34	2		6%
Office type of occupation	personal experience category	34	15		44%
Relation with colleagues	personal experience category	34	0		0%
Family influence	personal experience category	34	2		6%

Discussion

The company invites highly qualified personnel, offers various benefits to workers and their families, and promotes environmental responsibility. ERG is seeking to maintain sustainable development by supporting the women unit of the company and, compared to other mining companies, emphasizes mothers. However, there is a lack of subjective opinion of women employees on the official website and social media sources. ERG is the only renowned company with a female league that encourages women to aspire to leadership positions. The company does not share specific information and quotes of women employees. Thus, it is impossible to determine the exact attitude to women's diversity according to web content.

4.2.5 Polymetal

Polymetal is one of the leaders in precious metals mining with assets in Russia and Kazakhstan. It is one of the top 10 gold mining companies in the world. The Company is included in the FTSE 100, FTSE Gold Mines, and MSCI Russia indices. It owns nine operating gold and silver deposits and a high-quality portfolio of development projects. Polymetal promotes sustainable

economic development in the regions where it operates. The Company actively works with local communities and pays attention to environmental safety issues.

On official web source [www.polymetalinternational.com] Polymetal mining company one news publication and three corporate policy sections with code words ‘women’, ‘women in mining,’ and ‘female employees.’

Resource category

The Group has a total workforce of over 10,000 people. Polymetal’s corporate policy includes inclusivity, diversity, and human rights standards, according to the website. Due to challenging working conditions and the remoteness of many production facilities, most personnel are involved in FIFO labor. Polymetal offers competitive salaries and social packages that are better than average in the same regions to attract and retain talented expertise. Polymetal claims that the crucial resource of the company is people; thus, decent working conditions are vital. The company is seeking to create the necessary environment to increase the number of women. The company plans to achieve 30 percent female representation in the working pool by 2025. Besides, Polymetal is a co-founder of the non-profit organization Women in Mining Russia. According to the official website, three female employees are included in 100 Global Inspirational Women in Mining, the non-profit organization Women in Mining (WIM UK). In addition, gender distribution in the board of directors comprises 33 percent of female and 67 percent of male personnel.

Personal experience category

On the official web source, Polymetal delivers information about three female employees. All of them are in senior positions. One of them is the founder of the association Women in Mining Russia and represents the interests of women in the mining industry. Another woman employee participates in international conferences where she is often the only female speaker and shares Polymetal's approach to stakeholder engagement, effective corporate governance policy, socio-cultural diversity, and gender equality. A third female employee is a managing director in one of the most inaccessible regions in Russia. She is responsible for the open pit and the heap leach plant operation.

Subjective opinion and interest category

Women employees do not share any subjective opinions on website publications, and quotes are absent. Meanwhile, the Group identified FIFO labor as the main barrier for the women

working in Polymetal company. FIFO labor disadvantages for women could be family relationship difficulties, absence of flexible arrangements, sexual harassment, and lack of gender awareness. However, if that case for disturbing conditions, Polymetal Group has a telephone helpline to receive reports of the Code of Conduct violations.

Results

Table 6. The number of meaning units and frequency categorized using code words in Polymetal company's content

Meaning units	Category	No. of publication	No. of meaning units	Code words	Frequency
Initial adjustment	personal experience category	5	2	women, women in mining, female employees	40%
Work process	personal experience category	5	4		80%
Benefits	resource	5	5		100%
Barriers	subjective opinion and interest	5	1		20%
Manual type of occupation	personal experience category	5	1		20%
Office type of occupation	personal experience category	5	3		60%
Relation with colleagues	personal experience category	5	2		40%
Family influence	personal experience category	5	0		0%

Discussion

According to the web source, the level of support of women is relatively high. However, Polymetal does not share any personal experiences of the women employees. Thus, it is hard to have certain conclusions towards gender parity of The Group. Nevertheless, Polymetal has a diverse decision-making board and moves forward to an inclusivity strategy. The company presents stories of successful women individuals and inspires female personnel to join the WIM non-profit association. Still, it is impossible to correctly determine the actual conditions or trends in women's employment due to limited information on official web sources.

4.2.6 Organizations supporting women in the mining industry of Kazakhstan

Women in Mining Kazakhstan

WIM KZ is a non-profit organization interested in gender mainstreaming, supporting, and encouraging women to join the Mining sector. According to the webpage [wimkz.org], the organization was founded in 2020 by dedicated volunteers. Board members are men and women from academia and industry in Kazakhstan, the UK, the USA, Canada, and Australia. Women in Mining Kazakhstan aims to raise awareness and promote the advancement of women across the mining area. The organization was established to help women find and develop a career in the sector. Everyone from the industry can join and volunteer.

4.2.7 Summary

This part of the study was conducted to contribute information on the current state of women in mining companies. The key challenges and positive aspects were found by identifying attitudes towards female workers by large mining enterprises in Kazakhstan. According to the findings, local mining companies improved gender diversity and inclusivity for the past decade. However, the biases need to be considered in web sources due to the specific business model of some companies. The majority of official publications are filtered and not fully verifiable. The information is delivered in a different manner from each mining company. Some mining companies emphasize professional skills and work processes, and some focus on female workers' personal life and experience. In Fig. 11, the correlation between the meaning units and frequency in official publications is presented.

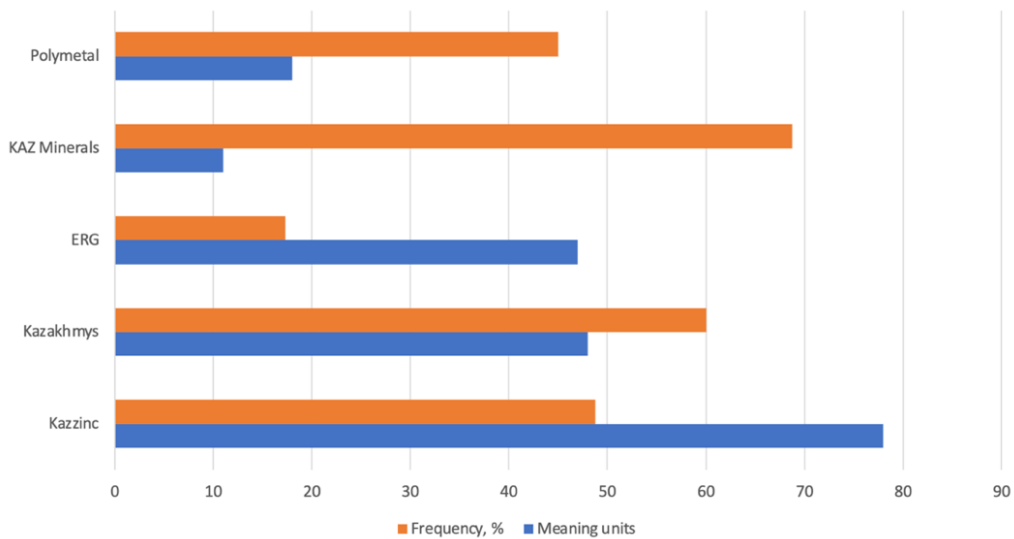


Figure 11. Number of meaning units and frequency in official website publications

According to the linear histogram, KAZ Minerals has minor meaning units but higher frequency because of more critical content. A more significant number of meaning units has Kazzinc company with less frequency, The Group’s primacy is social well-being of employees. Kazakhmys Group, compared to other mining companies, demonstrates the average number of meaning units and frequency. Nevertheless, the company’s content provides more information on the work process and relationship with co-workers; thus, the company prioritizes professional and personal skills. ERG and Polymetal demonstrate opposite results, ERG company has more meaning units with less frequency, and Polymetal shows fewer meaning units with higher frequency. ERG has a different strategy than other companies, and The Group prefers to dedicate trainings and events to attract and help women personnel. Polymetal has the most diverse board of directors compared to other companies, and gender diversity is of the highest importance.

Overall, the mining companies of Kazakhstan show effective development in increasing female inclusion.

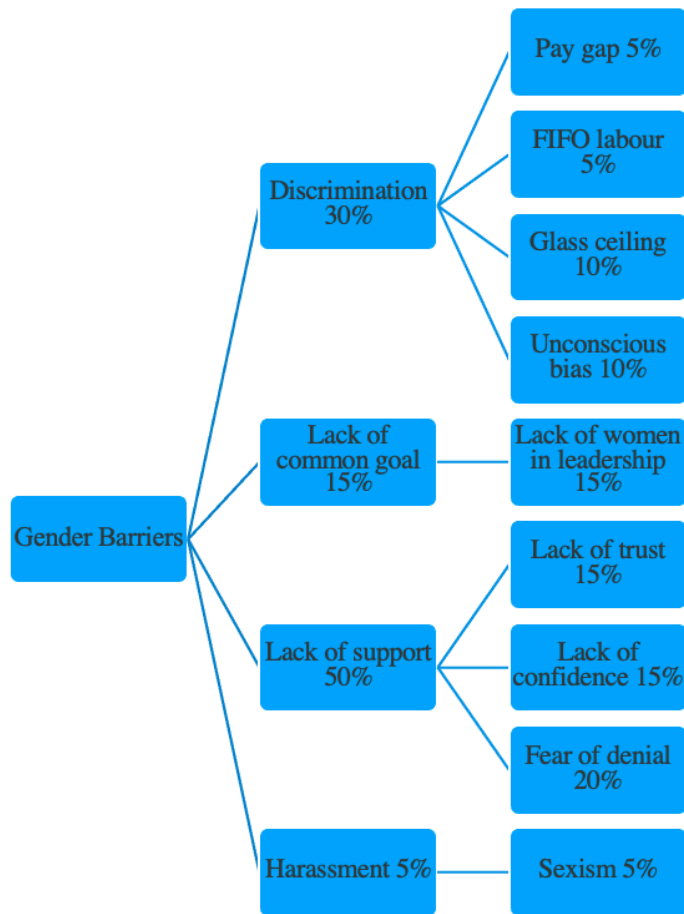


Figure 12. Identified gender barriers from content analysis

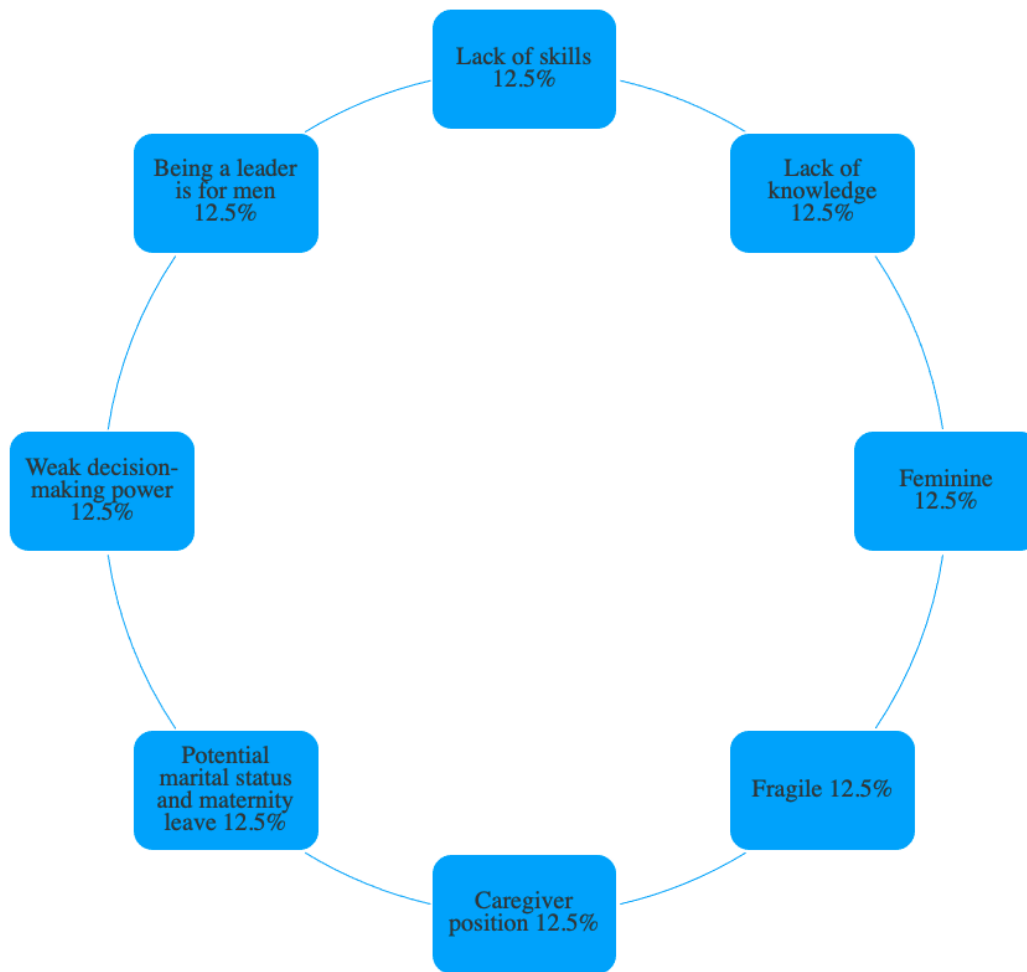


Figure 13. Identified gender stereotypes from content analysis

Nevertheless, women still face challenges while working in mining companies. Gender barriers and stereotypes were identified through content analysis. These barriers and stereotypes were identified through comments of women workers interviewed on official publications of five mining companies. In companies' publications, female employees shared issues in the mining industry from their perspective. The issues were sorted into barriers (themes and sub-themes), and stereotypes are shown in Figs. 12 and 13.

A non-profit WIM organization helps women in the industry, which shows that the issue was identified, and a supportive organization is present. Issues to work on are present. Raising awareness and implementing successful strategies of World Leading mining companies will benefit the female community, companies, and country's economy.

CHAPTER 5

5. CONCLUSION AND RECOMMENDATIONS

The primary purpose of this research was to study the current state of gender diversity in Kazakhstan's mining industry. Persistent barriers are discussed in this thesis. Gender equality in Kazakhstan's mining industry was examined as part of the quantitative and qualitative analyses.

The main findings of thesis research are in the following:

- Existing publications on the gender imbalances in Kazakhstan did not address the issue in the mining sector; gender disparity in mining has resulted in poor labor outcomes in this sector.
- Qualitative analysis identified positive outcomes regarding large mining companies; however, medium-sized enterprises were not considered. Some large mining companies show interest in gender diversity and plan to attract more female employees through social support, a protected working environment, professional development courses, and good working conditions. These companies also encourage women to be a part of the decision-making board. Nevertheless, not all companies share the same view.
- Gender barriers and stereotypes in Kazakhstan's mining industry were identified through content analysis.
- Statistical data analysis showed positive progress through 12 years in case of the pay gap, but not in employment and education. The latter two indicators stay the same and need improvement to reduce the gender gap. Thus, gender segregation based on gender pay gap is not the reason of low representation of women in the mining sector.
- Low demand from mining companies affects the condition of low supply of women with educational degree related to the mining industry who are willing to work in the industry. However, some mining companies seek an improvement and regulate terms of demand in diverse working pool.
- Due to data shortage the distinction between three types of gender segregation was not provided in research part of thesis.

The list of prohibited professions was repealed at the end of 2021, and now women are allowed to work in several working positions. To increase female participation in the mining industry, these principles need to be enacted:

- Implementation of laws and policies promoting equal opportunities and treatment for women in terms of civil and social life.
- Social security and protection of women by legislation that will protect women and men from discrimination and gender-based violence.
- Elimination of laws, restrictions, and cultural practices based on gender stereotypes or maintaining gender roles where women are limited in freedom of movement or compound gender-based discrimination in the workplace.

Issues to work on include raising awareness and implementing successful strategies of the leading international mining companies such as Rio Tinto. The company has various strategies in many countries related to the social support of the local female community or promoting women's participation in the mining operation. Local non-profit organization Women in Mining Kazakhstan also could consider strategies of international organizations Women in Mining USA, UK, Russia, and others. It will positively impact Kazakhstan's communities, companies, and the country's economy.

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