The Artisanal and Small-Scale Gold Mining Sector in Mongolia:

A Contextual Study of the planetGOLD Mongolia Project Sites

planetGOLD Mongolia

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БАЙГАЛЬ ОРЧИН, АЯЛАЛ ЖУУЛЧЛАЛЫН ЯАМ

AGC

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About This Report

This report has been prepared by the Artisanal Gold Council (AGC), the executing agency for the planetGOLD Mongolia project to develop an understanding of the status quo of the artisanal and small-scale mining (ASM) sector in Mongolia, in particular to assess the current status of prevalent ASGM practices, attitudes and knowledge levels among relevant stakeholder groups in the project sites (hereinafter referred to as 'study areas'). The findings from the contextual study provide additional information that can help determine project approaches, and in certain instances provide baseline data for the project.[1]

Funded by the Global Environment Facility, planetGOLD is led by the United Nations Environment Programme and implemented in partnership with the United Nations Industrial Development Organization, United Nations Development Programme, and Conservation International. The 'child project,' planetGOLD Mongolia is executed by the AGC in partnership with the Government of Mongolia through the Ministry of Environment and Tourism. The planetGOLD programme seeks to contribute to the elimination of mercury in the artisanal and small-scale gold mining (ASGM) sector through the provision of support for the government to develop and implement policies to enhance formalization of the ASGM sector, facilitate miners' access to formal gold markets and capital to purchase mercury-free processing equipment as well as to introduce responsible mining, gender and environmental practices in targeted ASGM areas. Artisanal miners will get access to mercury-free processing technologies that are appropriate to the needs and conditions of the target mining sites.

The project aims to implement the following four components until the end of 2023:

I. Review of the policy and legal frameworks supporting formalization of the ASGM sector;

II. Introduction of financing schemes allowing miners to adopt and subsequently invest in mercury-free technologies and access international gold markets more directly;

III. Upscale mercury-free gold processing technologies in the selected mining sites; and

IV. Dissemination of information and knowledge created under the planetGOLD programme.

At the end, the project is expected to achieve (i) an increased formalization of the ASGM sector, (ii) improved access to responsible gold markets by miners, (iii) reduced mercury releases by the ASGM sector, and (iv) increased information dissemination globally.

The report has been prepared with additional support from SICA LLC. SICA LLC was responsible for developing the study design, the data collection tools, the data collection in the field, data entry and preliminary data processing. All those steps were carried out in close collaboration with planetGOLD Mongolia team. Also, a monitoring team from the

[1] The contextual study is not the project baseline. A separate project baseline matrix, as elaborated in the project document, will be populated and submitted separately.

planetGOLD Mongolia team worked in the field during the data collection process in the target locations and participated in the daily debrief meetings.[2]

While covering only the study areas in Selenge, Gobi-Altai and Khovd aimags, the report presents and examines all aspects of artisanal gold mining including the current socio-economic situation of artisanal mining communities, their access to and health and social services, gender issues, hard rock gold mining activities, gold processing, technology, mercury use, environmental management and rehabilitation, and training needs of miners. The study findings and recommendations are important for the improvement of planning and implementation of the policy and procedures to ensure better mining, gender equality and protection of human rights of the miners.

The Government of Mongolia ratified the Minamata Convention in 2015 and approved a National Action Plan (NAP) for Reducing Mercury Pollution from Artisanal and Small-scale Gold Mining (ASGM) in Mongolia on 19 August 2019. The NAP proposes 13 strategies around four objectives which aim to eliminate the worst practices and harmful technologies, accelerate ASGM sector formalisation, protect health of artisanal and small-scale miners, particularly women and children and prevent exposure to mercury and increase access to information. The planetGOLD project, by its activities, will significantly contribute to the implementation of the NAP.

About the United Nations Environment Programme and the United Nations Industrial Development Organization

The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system, and serves as an authoritative advocate for the global environment. The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability. As two of the implementing agencies for the planetGOLD Programme, UNEP is responsible for Components 1, 2, and 4, and UNIDO is responsible for Component 3.

For more information on UNEP and UNIDO visit their websites at https://www.unep.org/ and https://www.unido.org/

About the Artisanal Gold Council

The Artisanal Gold Council (AGC) is a not-for-profit organization based out of Victoria, BC, Canada dedicated to the sustainable development of ASGM communities in the developing world. The AGC aims to improve the ASGM sector through awareness, training, education, and capacity-building. The diversity of our work and our grass-roots approach allow us to effectively bridge field work with national and international policy. To improve the ASGM sector worldwide and have a positive impact on the millions of people involved in this

[2] The planetGOLD Mongolia team carried out the in-depth study on gender issues in the sector, in close collaboration with the AGC Gender Expert.

sector in more than 80 countries, we use our deep field knowledge and focus on the following strategic areas: Improved practices, Governance, Livelihoods, Health, Environment, Gender equality, Market access, and Development. Our integrated approach seeks to build an environmentally sound, socially responsible, and formalized ASGM sector effective at transferring wealth from rich to poor.

For more information about the AGC visit their website at https://www.artisanalgold.org/

About SICA LLC

The Statistical Institute for Consulting and Analysis LLC (SICA LLC) was established in 2010 with a strong commitment to contributing to Mongolia's social and business development through meaningful statistical research, analysis, and professional consulting services. SICA has experience in designing and conducting surveys and evaluations such as baseline studies, monitoring and interim assessments, desk study and end-line evaluations surveys. SICA's survey design and methodology incorporates innovative new technology that incorporates scientific approach, effective data collection and concrete analysis. You can find out more about SICA at www.sica.mn and www.datamon.mn.

Acknowledgments

We would like to thank the Ministry of Environment and Tourism, Ministry of Mining and Heavy Industry, the Artisanal and Small-scale Mining National Federation of Mongolia, SICA LLC, aimag, soum and bagh government officials of the study areas, including Selenge, Khovd and Gobi-Altai aimags as well as the various central and local mining sector agencies and environmental activists for their valuable advice and support in conducting the baseline assessment.

Conducting this study would not have been possible without the support and collaboration of the artisanal and small-scale gold miners, partnerships and NGOs with whom we interacted during the study and throughout the course of the project, to whom we are enormously thankful.

Disclaimer

The report has been prepared for the use and benefit of the planetGOLD Mongolia project activities and is not for public dissemination. Though every effort is made to ensure the accuracy and completeness of its data and information, the authors does not take any responsibility and accept no liability for any consequences whatsoever of pursuing any of the recommendations provided in this report, either singularly or altogether. Opinions and information provided are made as of the date of the report issue and are subject to change without notice.

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Executive Summary

This report has been prepared by the Artisanal Gold Council (AGC), the executing agency for the planetGOLD Mongolia project to develop an understanding of the status quo of the artisanal and small-scale mining (ASM) sector in Mongolia, in particular to assess the current status of prevalent ASGM practices, attitudes and knowledge levels among relevant stakeholder groups in the project sites (hereinafter referred to as 'study areas'). The findings from the contextual study provide additional information that can help determine project approaches, and in certain instances provide baseline data for the project.[3]

The planetGOLD project, funded by the Global Environmental Facility (GEF), seeks to contribute to the elimination of mercury in the Artisanal and Small-scale Gold Mining (ASGM) sector through the provision of support for the government to develop and implement policies to enhance formalization of the ASGM sector, facilitate miners' access to formal gold markets and capital to purchase mercury-free processing equipment as well as to introduce responsible mining, gender and environmental practices in targeted ASGM areas.

Study Design

Mongolia has traditionally been a livestock-based economy. Transitioning to a market economy during the 1990s caused significant economic disruption bringing about rapid increase in unemployment and underemployment ushering an increase in poverty across the country. Mongolians looked for any opportunity to sustain themselves and their families and workers from other sectors were driven into ASM out of economic necessity. A study estimated in the early 2000s that 100,000 people, who indirectly supported more than 400,000 Mongolians, were trying to support their families through artisanal mining (World Bank, 2007). A recently conducted nationwide study indicated that around 74% of the total surveyed artisanal miners (11,962) are engaged in gold mining (NSO, 2017). To improve and sustain economic conditions, the Government of Mongolia has implemented Gold programs since 1991 and recently approved the Gold-2 program to support gold exploration and mining companies by creating a favorable loyalty and tax regime and improving technologies, permitting procedures and regulations and artisanal gold mining and sales.

This contextual study is designed to provide a baseline assessment of current conditions, standards and practices of artisanal and small-scale mining in the selected study areas: Bayangol soum, Mandal soum and Tunkhel village (of Mandal soum) of Selenge aimag, Altai soum of Khovd aimag and Yusunbulag soum of Gobi-Altai. The classification of informal, formal and illegal miners was used for the first time in this analysis to identify and assess formalization status and organizational types of the miners in the study sites.

[3] The contextual study is not the project baseline. A separate project baseline matrix, as elaborated in the project document, will be populated and submitted separately.

A total of 371 miners (100 women, 271 men) participated in the quantitative survey and 73 key stakeholders including central and local government officials, ASM NGO and partnership leaders, artisanal miners, processing plant workers and civil society stakeholders were interviewed. In addition, an in-depth study of gender issues, supply chain and gold trade in the sector was conducted.

Socio-economic Background of the Study Areas

The study focused on five active mining communities in three aimags. Selenge aimag has a history of both large and small-scale mining, with Bayangol soum as one of the first artisanal mining communities dating back to 1997. In Mandal soum and its sub-district of Tunkhel village, artisanal mining has become one of the primary livelihoods in the community. In Yusunbulag, there are currently no hard-rock gold mining sites and miners source their ore amongst others in Altai soum in the same aimag and process the ore in Yusunbulag. Two processing plants are operating in Yusunbulag soum. In Altai soum in Khovd aimag, artisanal mining started recently, though there are no processing plants throughout the aimag. Of the total 371 miners surveyed, majority were between 30 to 50 years old and having engaged in mining for over 10 years. Majority (78%) of respondents had at least a high school diploma and over 10% obtained higher education. To engage in artisanal mining, the majority of the miners were organized (76%), mainly within registered partnerships or ASGM NGOs complying with respective laws and regulations.

Artisanal mining was ranked as primary employment for 50% of the respondents and as main income source by 77%; one third of respondents (33%) only live from artisanal mining. Miners in Yusunbulag soum and Tunkhel village have especially become dependent on artisanal mining. While working in artisanal mining as their primary employment, half of the respondents also engage in other activities, such as herding, government and self-employed jobs to supplement their income. While 20% of miners earn monthly income above MNT 1,000,000[4] (which is above the regional income average) from artisanal mining only, most artisanal miners cannot live from ASGM only. Even though, many mining partnerships indicated that they distribute income equally, income can also depend on the position and tasks of the miners in the sector.

Social and health insurance coverage is insufficient, covering 40% and 63% of the miners, respectively. Irregular and unstable operations of artisanal mining, lack of knowledge and information on benefits of social and health insurance schemes could be the major factors affecting low coverage of social insurance among miners. Awareness building campaigns on the importance of routine occupational checkups and social insurance is one important step to increase coverage.

When assessing the impact of COVID-19 on artisanal mining, the most reported disruptions are: income loss due to job loss, inability to go to work, and reduced production capacity due to the limited number of workers on the site.

[4] It equals 350 USD according to the exchange rate of Mongol Bank as of 1 July 2020 ($1 = ₮2849.25)

Formalization

The Government of Mongolia has taken significant steps to regulate the sector since recognizing it in 2010. 18 legislative acts are currently regulating the sector to various degrees. In the five study areas surveyed, artisanal miners are organized in registered and unregistered partnerships for their mining activities. In addition, these communities have joined together to form an NGO to protect their rights collectively.

However, creating an enabling environment for artisanal miners continues to be a challenge with suspension of key clauses in specific regulation and delayed revisions of the ASM Regulation has resulted in uncertainty for the sector. A critical component of the first step towards ASGM formalization is the availability of a permitted mining site. Access to land that does not overlap with other areas is limited.

Exacerbating the paucity of permitted mining sites is the very short contract extensions awarded to existing mining contracts. Even though ASM Regulation 151 stipulates mining contracts to conclude until the depletion of resources, contract extensions are usually given for only three to twelve months. This is a major disincentive for miners to formalize given the short contracts. Delays and bureaucracy in issuing Land Conclusions, a prerequisite for a mining permit, and extending mining contracts results in miners easily slipping to informal status. Furthermore, Government Resolution 355 of 2019 suspended ASM mining land applications, conclusions, and contracts which has further increased the informality of the sector. The result of the report affirms the consistency of these problems miners are facing as they attempt to take the first step to formalization. For the Mongolian Government to comply with its Minamata obligations, it needs to address these persistent issues as part of its formalization strategy under its ASGM National Action Plan

The challenges mentioned above can be addressed by improving the artisanal mining regulations by taking into consideration the specific needs of ASGM and emphasizing an integrative approach to address the complex poverty-driven issue afflicting the sector. Also, the formalization will be further encouraged by addressing barriers to the issuance of Land Conclusion and rationale extensions of mining agreements. When extending a mining agreement based on the terms of the contract and the performance act, the sustainability of the mining activity should be considered. Eliminating and resolving delays to the land conclusion and contract extension process is a crucial point for responsible mining.

Mining Practices

Technical Practices

The main feature of Mongolian hard rock ASGM is the divide between ore extraction and ore processing as independent subsectors, conducted by distinct groups.

Extraction of hard rock ore is performed by basic manual and powered equipment due to strict ASM regulation limiting maximum allowable engine size. Mine working consists of shaft and tunnel systems that trace gold veins that the miners selectively high-grade. Few

mining operations utilizes blasting as blasting permits are difficult to secure and expensive if outsourced to licensed companies. Study areas with high mining development prioritized increasing production, while less developed areas prioritized the acquisition of general permission to mine, beginning with land permits.

Gold processing is conducted mostly at informal processing facilities, with only two permitted processing plants in all of Mongolia. A basic gravimetric system is used by most processing facilities consisting of sluices and shaking tables to recover gold from ore. Process control is very rudimentary as miners rely mostly on empirical methods, such a detection of visible gold, for quality control.

Process plant ownership, and in turn fair profit sharing, is a challenge in Mongolia as artisanal miners are unable to establish their own permitted processing facilities due to high entry barriers and must instead hire third-party processing facilities. Processing plant owners exploit the artisanal miners by offering them unfavourable conditions that the miners must accept for lack of processing alternatives. A large portion of the gold remains in the tailings and is kept by the processing plant owners who sell this material to cyanidation facilities for additional profit that are unrealized by the artisanal miners. As a result, miners will sometimes use mercury to attempt to recover more gold on their own despite the high risk of prosecution. Access to better processing systems with fairer conditions is therefore an important prerequisite to stop miners from using mercury.

Environmental Practices

As required by ASM Regulation 151, the majority of ASM partnerships in the study areas (69% of respondents) develop rehabilitation plans, though practices seem to be mainly limited to backfilling. Particularly, biological rehabilitation is not commonly undertaken by the partnerships in these areas. In addition, KII findings indicate that though partnerships deposit the fund for rehabilitation to local funds, they face challenges in withdrawing the deposited amount when needed. Streamlining access to funds and monitoring the compliance with rehabilitation measures will be crucial to minimize long-lasting negative environmental impacts of ASM operations.

The survey shows that miners usually bury, burn or transport their waste to landfills. However, since ASM sites also produce non-biodegradable materials such as plastic waste and hazardous materials such as batteries, proper disposal systems especially for hazardous materials at the soum level should be put in place for miners. This also applies to chemical materials; miners avoided mentioning the use of these substances for fear of penalization for improper disposal practices. However, if chemicals are used clandestinely, it will be difficult for miners to dispose of those properly as well.

Overall, KII stakeholders identified a high training need for artisanal miners to improve their environmental practices; however, this attempt should also be supported by a system that provides disposal solutions and monitors environmental compliance at ASGM sites.

OHS Practices

In Mongolia, mining safety and occupational health issues in ASM have been regulated by the Government since 2010 - the “ASM Safety Rule” was approved in 2010 and further

improved in 2017. Even though, there is also a regulation for reporting, rescuing, and preventing occupational accidents, in practice, data on ASM related incidents is not clearly categorized in this reporting system.

This study highlights the gaps to fulfill the OHS standards and better mining practices in ASGM. For example, only 57% of respondents do always use personal protective equipment and only 54% had a risk mitigation and work safety plan in place or had an OHS officer (53%). Compliance was overall higher among formal miners than informal and especially illegal miners. This indicated that the safety practice is directly connected to level of formalization of the sector and that those groups should be specifically targeted for OHS training programs.

According to ASM Regulation 151, local government officers, who are in charge of mining or OHS, have the responsibility to conduct capacity building trainings on legal frameworks and OHS to miners. However, the OHS knowledge of these local officers is not sufficient. Therefore, they need to be trained on the ASM Regulation and the Safety Rule in order to fulfill their responsibilities.

Overall, the findings indicate that more capacity building on OHS is required, which does not only address the different safety measures such as securing hazardous sites, but also how to determine OHS risks, develop and implement an OHS plan successfully at the mining site.

Mercury Use

Though mercury use has been banned in 2008 in ore processing in Mongolia, hidden amalgamation of whole ore or middling from processing plants is still prevalent. The "National Action Plan for Reducing Mercury Pollution caused by ASGM in Mongolia" (NAP) was approved in 2019 in compliance with Mongolia's obligation under the Minamata Convention to which it is a party to. The outputs of the planetGOLD project will contribute to the implementation of the NAP. A first step during this study was to assess mercury use and practices within the study areas. Due to illegality and fear of prosecution by miners, it is difficult to estimate how much mercury is used in ASGM. However, the survey and KII interviews indicate that there were cases of mercury use, trade and contamination in all three areas.

Reduction of mercury use in the ASGM sector, as well as the prevention of future use, can only be achieved through a combination of various measures, ranging from legal actions at the political level to improved access to alternative, high-efficiency technologies at the level of ASM organizations. Hence, processing plant owners are an important stakeholder group as they do currently determine access to available technologies and income (through the plant efficiency and because many plants also buy the gold from miners) of miners. Also, understanding the dangers of using mercury for human health and the environment is an important prerequisite to motivate artisanal and small-scale mining communities to switch to mercury-free processing systems.

Gender

Several aspects that have been analyzed in the gender mapping - including income, leadership, access to resources and decision-making powers - indicate that work relationships between women and men miners are quite equitable in the ASGM sector, despite a clear gender division of labour. The administrative, management and leadership roles of many women miners in mining organizations as well as a better knowledge of legal frameworks and interest for further capacity building can make them to important change agents in the sector. This should be acknowledged by local and central government stakeholders and taken into account when developing training programs for the sector.

However, women can be more vulnerable to gender-based violence - more so on the domestic sphere but also at work (e.g., verbal violence) - and are overall affected by a double work burden, due to a traditional division of labour between women and men. The in-depth study indicated a low understanding of the gender concept and gender identity among artisanal miners, indicating a strong need for gender training for women and men miners to create awareness about gender roles, enhance gender equality and prevent gender-based violence.

Gold Trade and Supply Chain

Although the Mongolian government is taking measures to formalize gold trading, related regulations were only recently approved in 2020 and the traders and miners in rural areas lack information and guidance on gold trade formalization. In the study areas, there were only a few traders per every region, which results in a relatively uncompetitive market, creating dependence and reducing miners negotiating power. The Bank of Mongolia (BoM) buys gold for a competitive price, based on LBMA market prices. However, because of the geographical inaccessibility, lack of information on formal gold supply regulations, bureaucracy and the minimum assay requirement on gold weight, most miners sell their gold to local traders. Under the existing legal environment, the BoM conducts inadequate due diligence on the supplied gold and does not require traceability to the mine of origin. Record keeping of ore extraction and gold sales was not sufficient in the surveyed regions.

Formal access to finance for miners can be a crucial catalyst for responsible ASGM. However, it is not available for artisanal miners in Mongolia, because the current ASM regulations limit investor interest in the sector. Further, financial sector actors, such as banks, do not have enough information and knowledge of ASM and perceive the sector as high-risk, which leads miners to depend on their own funds or reach out to local gold traders for help. Thus, it is important to look at the ASM legislations, to enable and build the foundation for attracting investor interest, and to curate relevant financial information on ASGM, disseminate this information to the financial sectors for the latter to properly evaluate risks and benefits for possible investment. Additionally, it is recommended for the government to incentivize miners and traders through developing a special ASGM program aimed at improving access to finance, increasing formal gold supply and enabling responsible ASGM.

Capacity Building

Ensuring access to information is crucial for miners to get updated and latest knowledge on better mining practices, formalizations and gold prices. While half of the respondents receive information from other people working in the ASGM sector, friends, relatives, they also prefer to get information from TV, mobile phones and Facebook. However, most miners do not use, for example, the Internet to check current gold prices.

Over the past two years, one third of the miners had attended at least one training, mainly on formalization, responsible mining standards, rehabilitation, environmental management and supply chain. Interestingly, the gender gap was reversed, with a relatively higher training attendance among women. Training needs identified by miners focused on formalization, responsible mining practices and rehabilitation. Government officials from central and local governments indicated that there is a need to conduct on-the job short–term trainings for artisanal miners on risks and harms of using of mercury, laws and regulations and formalization of mining operations and environmental issues.

Summary of Findings from the Contextual Study that will inform the Project Baseline

The objective of the contextual study was to develop an understanding of the status quo of the artisanal and small-scale mining (ASM) sector in Mongolia, in particular to assess the current status of prevalent ASGM practices, attitudes and knowledge levels among relevant stakeholder groups in the study areas. The findings from the contextual study provide additional information that can help determine project approaches, and in certain instances provide baseline data for the project. The contextual study is not the project baseline. A separate project baseline matrix, as elaborated in the project document, will be populated and submitted separately.

The table below contains the following information for the reader:

- **Quantitative indicators**, which can help in monitoring the project throughout its implementation and can be used to measure change over time. These indicators were covered in the study methodology as part of the contextual study approach and correspond to several baseline project objective level indicators and outcome indicators.
- **Qualitative indicators** presented below summarize findings from the survey and KIIs, by assessing the current status of the sector on a 3-point scale (low/moderate/high). While the qualitative indicators presented here do not present composite indicator (with a systematic approach), they help the reader to assess the status of the sector. Brief explanation of the factors considered are listed below; more information is provided in the report.

Project indicators	Quantitative indicators (survey)	Qualitative indicators (KII and survey)

Objective level indicator		
Quantity of mercury reduced [5]	Mercury estimates in project areas from NAP[6]: - Selenge aimag: 120 kg (Mandal soum: 8 kg, Tunkhel village: 40 kg, Bayangol soum: 40 kg) - Gobi-Altai aimag: 23 kg - Khovd aimag: 20 kg[7]	**Mercury use in project sites: *CONFIRMED*** *Clandestine mercury use was confirmed by gold traders in Bayangol soum (Selenge aimag) and government officials in Altai soum (Khovd aimag) and Yusunbulag (Gobi-Altai aimag).* *In total, 15% of survey respondents reported to have observed mercury use in their province in the last 2 years (higher among informal (29%) and illegal miners (14%)) and 7% to have observed trade (higher in Yusunbulag soum of Gobi-Altai province-11%). Data is most likely underreported due to fear of legal prosecution.*
# of women and men miners that have access to capital to finance mercury-free technology and equipment	% of respondents who received financing from commercial banks: 3% % of respondents who use their own capital to finance their mining operations: 83%	**Access of miners to local banks: *LOW*** *During the interviews, leaders of ASM organizations mentioned that, because most miners do not pay social insurance, they cannot provide any proof of income to the bank. Also, because the ASM regulation prohibits miners from using their ASM permit and land as collateral or shifting their land rights to others, this limits their ability to approach banks as well. On the other hand, the mining income is considered high risk and not stable. Thus, there is a perception of having no valuable collateral available, a main financial requirement in financial systems required to protect banks from non-performing loans.* **Gender-inequalities in accessing finance: *LOW*** *KII and survey data show that access to finance is not influenced by gender.*
# of women and men miners that have access to responsible gold markets (from miners to refiners)	% of respondents with access to responsible gold markets: 0%[8] % of respondents with record keeping practices: 24% (gold sales), 43% (ore extraction)	

[5] Since mercury is legally prohibited to use in the country and miners can face heavy jail sentences, it was only possible to ask indirect questions on mercury use. Though an attempt was made to calculate mercury use at the soum level based on ore extraction and processing data as well as gold sales based on the UNEP toolkit (O'Neill/Telmer, 2017), it was not possible to derive realistic estimates due to the specific characteristics of the Mongolian ASGM sector (i.e., amalgamation mainly restricted to an unknown percentage of middlings). The project will work on its methodology to derive realistic estimates of mercury use in the project sites.

[6] Government of Mongolia: The National Action Plan for reducing mercury pollution caused by artisanal and small-scale mining in Mongolia 2019-2023. (2020). http://www.mercuryconvention.org/Portals/11/documents/NAP/Mongolia_NAP_June-2020.pdf

[7] The NAP team did not provide estimates for the project target soums within Gobi-Altai aimag and Khovd aimag. The project will work on its methodology to derive realistic estimates of mercury use in the project sites.

[8] Data for this indicator was not collected during the survey, as there is currently no responsible gold market available in Mongolia. The Bank of Mongolia is currently not complying with international due diligence standards (e.g., traceability to the mine); hence, artisanal miners in Mongolia do currently have no access to responsible gold markets.

# of women and men miners selling directly to national institutions	% of respondents selling gold to Bank of Mongolia: 2% always, 3% rarely, 94 % never	
Outcome 1		
# of women and men miners adopting government incentives aimed at formalizing the ASGM sector	Not Applicable (NA) – this was not covered in the CS as it belongs to the project baseline.	**Government currently providing incentives for formalization**: ***LOW*** *Following the suspension of the ASM Regulation, the GoM aims to conduct an assessment reviewing and renewing existing policies and legislation on ASGM[9]. The legal assessment will cover issues (land tenure, mining rights, decent working conditions, gold trading regulations, and access to domestic and international markets) to reveal gaps and barriers hindering formalization in the sector and to reflect in development of more comprehensive policies and regulations.* **Transparency of the current formalization process**: ***MODERATE*** *Establishing a partnership is much easier for miners to engage in ASGM than establishing a cooperative in terms of the processes and formulating documents quickly and easily. Both partnerships and cooperatives provide formal rights as legal entities once they are registered by the state registration agency in their respective territories.*
# of women and men miners who have been formalized in all target project areas	- # of people organized into a partnership to engage in ASGM in target areas: 100 partnership and 790 members - # of unorganized miners in target areas: 2,100-3,600 (estimate) - % of respondents that can be classified as formal miners[10] (member of ASM organization + land conclusion + agreement with soum governor to work on the land concluded): 49%[11] - % of respondents who are members of an ASM organizations 76% - % of respondents who reported challenges in obtaining mining related permissions: 37% (42% of all	**Main barriers to formalization, identified through KII**: contract issues, unfair or bureaucratic process, documentation issues, do not fulfill requirements to sell to BoM

[9] The main administrative legal act regulating the activities of artisanal miners is the Regulation on Extraction of Minerals by Artisanal and Small-Scale Mining (ASM Regulation 151) approved by the Government Resolution #151 on May 24, 2017. The objective of the ASM Regulation 151 is to establish procedures for proper extraction of minerals in economically inefficient deposits for industrial mining methods and in waste fields derived from mining and technology, protecting the environment, and reducing poverty through increasing workplaces in local areas.

[10] A formal artisanal miner is a person who is above 18 years old, registered as a citizen of the respective aimag and soum where he is working as a miner. S/he is also a member of one of the organizations (registered, unregistered partnership member or cooperative member or NGO member). In addition, the formal miner has entered into a contract with the soum governor of the area where the MRPAM has issued a Land Conclusion, an official document confirming that the land is feasible for ASM extraction.

[11] This number does not represent the total percent of formal and informal miners in the project sites due to the sampling strategy (purposive sampling).

	respondents who are a member of an ASM organization) - % of miners working with a contract concluded with their respective soum governor: 59%	
Outcome 2		
Overall amount of money made available by investors or financial institutions	Not Applicable (NA) – this was not covered in the CS as it belongs to the project baseline. % of respondents who received financing from commercial banks or other financial institutions: 6%	**Access of miners to investors or financial institutions: *LOW*** *Most respondents finance their operations through their own capital. Only 3% of respondents received capital from commercial banks, 3% from non-bank financial institutions, 9% from gold traders and 6% from processing plants. An additional barrier for artisanal miners is that current regulations and policies do not touch upon attracting investment to ASM. The limits on ASM mining permits hampers foreign investment due to the lack of collateral. It also closes equity markets to the miners – the traditional source of early-stage financing for mining projects.*
Overall amount of money accessed by miners.	Not Applicable (NA) – this was not covered in the CS as it belongs to the project baseline.	
# of miners that have access to responsible gold markets (from miners to refiners)	*see objective level indicator #3*	
Volume of responsible gold from project areas sold into a transparent supply chain	0[12]	
# of miners that sell their gold into a transparent supply chain	0[9]	
Outcome 3		
Number of miners/ community members in project areas who adopted better mining practices	<u>Environmental practices[13]:</u> - % of respondents who chose a PP based on their Hg-free technology: 12% - % of respondents processing ore with mercury: 1.5% (underreported) (Bayangol: 6%) - % of respondents whose mining group has an environmental rehabilitation plan: 69%[14]	**Overall prevalence of good environmental practices at project sites: *LOW TO MODERATE*** *Current environmental practices vary within research areas, depending on status of formalization, and access to MFPP and capacity building activities. While many respondents answered that they comply with legal rehabilitation frameworks, many rehabilitation efforts seem to be limited to backfilling, with very low biological rehabilitation. Illegal amalgamation of middlings could not be*

[12] Data for this indicator was not collected during the survey, as there is currently no responsible gold market available in Mongolia. The Bank of Mongolia is currently not complying with international due diligence standards (e.g., traceability to the mine); hence, artisanal miners in Mongolia do currently have no access to responsible gold markets.

[13] Better mining practice indicators are self-reported and likely overreported due to social desirability bias. In addition, the quality of practices was not assessed, for example the completeness of a reported OHS plan, or the quality of an implemented rehabilitation measure.

[14] Of the miners who partook in rehabilitating their sites, two thirds of respondents (69%) indicated the activity of backfilling as part of their rehabilitation efforts. However, this alone does not indicate that successful rehabilitation has been carried out. It was revealed through more detailed questioning that the primary purpose of backfilling is not for rehabilitation, but rather to deter other miners for pirating their ore and for

	- % respondents whose mining group conducted rehabilitation at their mine site: 82%[15] - % of respondents whose mining group conducted biological rehabilitation: 3.8%	*localized and quantified during the study, but the continuous use and trade of mercury was confirmed in all five research areas.*
	<u>OHS practices:</u> - % of respondents that use PPE always: 57% - % of respondents that receive safety instructions before mining operation: 72% - % of respondents whose mining group has a risk mitigation plan: 54% - % of respondents whose mining group has an OHS officer: 53% - % of respondents following OHS standards a t the mining site: 58%	**Overall prevalence of good OHS practices at project sites: *LOW TO MODERATE*** *Around half of respondents indicate that they follow practices, and miners have already received some OHS training, but the quality of certain practices (e.g., OHS plan, OHS officer in place) is unclear. In addition, OHS practices are less adequate among informal and illegal miners. Government officials in KII emphasised the need for OHS training.*
	<u>Gender-equitable mining practices:</u> - % of female and male respondents being involved in decision-making at the mining site: 88% and 95% - % of female and male leaders among respondents: 19% and 10% - % of female and male respondents with preference for male leadership: 36% and 44% - % of female respondents reporting sexual harassment at the mining site: 1% - % of female and male respondents who have received ASGM related training in past 2 years: 47% and 35%	**Overall prevalence of good gender-equitable practices: *MODERATE to HIGH*** *Outcome indicators and findings from the gender in-depth study show that mining practices are overall gender equitable, but the gender in-depth study revealed that miners are not familiar with the gender concept and that women are affected by a double burden of work due to traditional gender division of labour and that gender-based violence is an issue in the Mongolian society, that also affects women miners.*
	<u>Training received in the last 2 years and training needs:</u> % of respondents who have attended training over the past two years: 35% (141 miners) (47% for women and 38% for men) - Formalization: 19% - Responsible mining practices: 18% - Rehabilitation: 9% - Supply chain: 8% - Health: 8% - Environmental practices: 8% - Business management: 7% - Technology: 6% - Financial management: 5% - Personal development: 5% - Gender & human rights: 2%	**Training needs of artisanal miners in project sites: *MODERATE TO HIGH*** *While 35% of respondents had access to training in the past 2 years, all respondents identified several training needs. Government officials identified high training needs for artisanal mining in the following areas: legal frameworks/formalization, environmental training, occupational safety training as well as training on health impacts of mercury.*

ground stability purposes. Hence, genuine rehabilitation efforts amongst mining organizations may be overexaggerated.

	Training needs identified by respondents: - Formalization: 35% - Responsible mining practices: 26% - Technology: 25% - Rehabilitation: 25% - Environmental practices: 19% - OHS: 19% - Supply chain: 16% - Financial management: 15% - Personal development: 14% - Business management: 13% - Organizational management: 7% - Gender & human rights: 8%	
Outcome 4.1 & 4.2		
# of ASGM stakeholders who adopted and utilized multi-sided platform/ knowledge hub	NA	**Current access of ASGM miners to existing knowledge hubs (from the SAM project): *LOW*** *The planetGOLD Mongolia knowledge hub has not yet been implemented. To assess lessons learned from an existing hub, the following information was collected.* - *% of respondents who are aware of the already existing ASM knowledge hub: 10% (13% women, 10% men);* - *% of respondents who have accessed the already existing ASM knowledge hub for information: 6%*
# of approaches agreed upon by ASGM communities and government	Preferred information sources by respondents: - TV (52% of men and 62% of women), - Mobile phones (37% of women and 49% of men), - Facebook (55% of women and 52% of men)	

Abbreviations, Lexicon & Terminology

Lexicon

Aimag	Province
Soum	Rural municipality, town
Bagh	Sub-district of soum, small village

Abbreviations

ARM	Association of Responsible Mining
AGC	Artisanal Gold Council
ASGM	Artisanal Small-scale Gold Mining
ASM	Artisanal Small-scale Mining
ASM NF	Artisanal Small-scale Mining National Federation
ASMO	Artisanal and Small-scale Mining Organization
BoM	Bank of Mongolia
CSPro	Census and Survey Processing System
DMKHKH	Duush Mandal Khairkhan Kholboo
GASI	General Agency for Specialized Investigation
GDP	Gross Domestic Product
GAASD	Gobi-Altai Aimag Statistical Division
ILO	International Labour Organization
FRC	Financial Regulatory Commission
FRM	Frugal Rehabilitation Methodology
GIZ	The Deutsche Gesellschaft für Internationale Zusammernarbeit
GEF	Global Environment Facility
Ha	Hectare
KII	Key Informant Interview
KASD	Khovd Aimag Statistical Division
LBMA	London Bullion Market Association
LN Law	Law to Prohibit Mineral Exploration and Mining Operations at Headwaters of Rivers, Protected Zones of Water Reservoirs (Long Name Law)
MET	Ministry of Environment and Tourism of Mongolia
MMHI	Ministry of Mining and Heavy Industry
MLSP	Ministry of Labor and Social Protection
MNT	International currency code for Mongolian tugrik, symbol ₮
MRPAM	Mineral Resources and Petroleum Authority of Mongolia
NAP	National Action Plan
NDA	National Development Agency
NEMA	National Emergency Management Agency
NGO	Non-Governmental Organization
NSO	National Statistics Office of Mongolia

OHS	Occupational Health and Safety
OSS	One-Stop Service
PMAID	Precious Metals Assay Inspection Department
PPE	Personal Protective Equipment
PPG	Project Preparatory Grant
PPROP	Processing Plant Requirements and Operational Procedure
PRISM	Platform for Real-time Impact Situation Monitoring
SACO	State Administrative Central Organization
SAM	Sustainable Artisanal and Small-Scale Mining
SASD	Selenge Aimag Statistical Division
SDC	Swiss Development Corporation
SIA	Specialized Inspection Agency
SPA	Specially Projected Areas
SPSS	Statistical Product and Service Solutions
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
USEPA	United States Environmental Protection Agency
WFP	World Food Program
WB	The World Bank

Terminology Used in This Report

To improve readability, the report uses the term artisanal miners or miners when referring to our study population, i.e., artisanal and small-scale gold miners. For laws or institutions, the report is referring to the artisanal and small-scale mining/ASM or the artisanal or small-scale gold mining/ASGM sector, as appropriate.

Furthermore, this report intends to follow gender-inclusive language guidelines to avoid any gender stereotyping and biases. The term "gender" is a more inclusive social construct and is therefore preferred over "sex." As well, the terms "woman" and "man" are preferred over "female" and "male". However, "female" and "male" are used as adjectives when appropriate and relevant.

1. Introduction

This chapter provides a brief introduction into the importance of gold mining for the Mongolian economy, and the role of the artisanal and small-scale gold mining sector. Afterwards, the study objectives, study design and methods are explained, followed by the limitations of this study and the outline of the report.

1.1 Gold Mining Sector in Mongolia

Mining is the leading industry of Mongolia, accounting for 20% of the country's GDP and 69% of the total industrial output. As of September 2020, the mining sector accounted for 94% of export revenue and contributed 20% of the state budget revenue (MMHI, 2020). Mongolia is a leading producer of mineral commodities such as copper, coal, and gold, but also produces and exports other minerals such as iron ore, zinc, fluorspar etc. The mining industry is regulated mainly by the Minerals Law of Mongolia, as well as by several other legislations on environmental management and protection, chemical usage, blasting, trading, human resources, etc. (Chapter 2). The Ministry of Mining and Heavy Industry (MMHI) is the government ministry that regulates the industry (See Info box 1).

Info Box 2: Key legal timeline for Mongolian gold industry

1991: Started implementation of "Gold" program
1994: Royalty fee set between 1.5-12.5%
1997: Started implementation of "Gold 2000" program
1997: Royalty fee set at 2.5% for hard rock deposit and 7.5% for alluvial deposit
2006: Royalty fee set at 5%
2006: Introduced windfall tax of 68% when gold price is higher than 500$/ounce
2008: Introduced windfall tax of 68% when the gold price is higher than 850$/ounce
2009: Adopted the "Long-named" law
2010: Up to 5% additional royalty fee introduced if gold price is over 500$/ounce
2011: Terminated windfall tax of 68%
2014: Royalty fee decreased to 2.5% between 2014 to 2019
2017: Started implementation of "Gold-2" program
2019: Royalty fee resumed at 5% and additional royalty to 0%

After coal and copper, gold is an important commodity that increases Mongolia's foreign exchange reserves and ensures the sustainability of the domestic currency. Mongolia's gold mining sector consists of large to medium scale mining (LSM) companies and artisanal and small-scale miners (ASM). LSM companies are required to obtain exploration or mining licenses in order to operate. As of October 31, 2020, 2,644 licenses (1,696 for mining and 948 for exploration) have been issued by the Mineral Resources and Petroleum Authority of Mongolia (MRPAM, 2020) (see Info Box 3), covering 4.0% of the country's land or 6,254.7 thousand hectares. . From the total 1,696 mining licenses, 533 were gold mining licenses that included both alluvial gold mining 442 (82.9%) and hard rock gold mining 91(17.1%) licenses. As of 2019, Mongolia has a

gold reserve of 1,587.1 tonnes of which 1,513 (95%) tonnes is hard rock deposit and 73.8 tonnes is alluvial deposit (MRPAM, 2019).

For the past 30 years, Mongolia's gold sector has seen many regulatory measures that affected the industry to various degrees (see Info Box 2). Mongolia has undergone a transition from a communist country with a centrally planned economy, to a democratic country with a market economy. After the loss of economic support from the Soviet Union, the challenge to Mongolia's economic development fell solely on the shoulders of the government. In an effort to improve the economic situation, the government developed the "Gold" program based on its mineral wealth. The "Gold" program was accepted by the Government and approved to be implemented as a Government project by Resolution No. 304 of November 1, 1991 (Soninbayar, 2019).

The Gold program was implemented until 1996. This program is now referred to as "Gold-1" to distinguish it from subsequent programs. The program is believed to have played a key role in attracting investment and overcoming the country's difficult economic times. During the implementation of the program, annual gold production increased from 0.7 tons to 11 tons, alluvial deposits were put into operation based on private investment, and a large amount of tax revenue was collected to the state budget. It is estimated that 13 tons of gold was mined under the Gold Program between 1992-1996. However, Gold-1 has been criticized as an environmentally harmful project due to its lack of rehabilitation and conservation measures. At the beginning of the Program, companies were in poor technical condition and had little understanding of rehabilitation, which had negative consequences. Moreover, generation of mining waste at most alluvial deposits enabled rush-type artisanal mining in central region of Mongolia (MRPAM, 2015).

After the conclusion of the Gold-1 program, the "Gold-2000" program was introduced in 1997. The Gold-2000 program was successful in terms of operation. A total of 53 tons of gold was mined under the Gold-2000 Program. Between 2000 and 2010, national gold production intensified, reaching 24.1 tons per year for the first time in 2005. However, the Mongolian Parliament passed the "Law on Taxation of Certain Products" on May 12, 2006,

Info Box 1: Ministry of Mining and Heavy Industry (MMHI)

The Ministry of Mining and Heavy Industry is the central government body that determines the policies of the gold sector, monitors their implementations, and ensures the coordination of the organizations involved in it. In this context, the ministry has the following major strategic goals:

- Development of mining legislation and long-term and medium-term strategic policies;
- Organize and coordinate the implementation of legislations, strategic policies, programs and commercial projects;
- Monitor the implementation of the legislations, policies and evaluate results, and make recommendations.

introducing a tax of 68% if gold price is more than 500$/ounce. The sharp increase in the tax led to a decline in the gold production and sales to the Bank of Mongolia (BOM). Further

introduction of the “Law on prohibition of mineral exploration and mining activities in areas in the headwaters of rivers, protected water reservoir zones and forested areas” (also known as Long Named Law) in 2009, has impacted the gold industry severely. It has led to the suspension of many mining and exploration licenses and bankruptcy of gold mining and exploration companies. The annual gold production of 17.5 t in 2007 declined three-fold to 5.7 tons in 2011 (MRPAM, 2015).

However, an increase in gold production and sales was observed in 2013 and beyond because of the improvement of the legal and tax environment of the gold sector. Particularly impactful was the abolishment of the windfall tax law in 2011, and the reduction of the royalty tax to 2.5% in 2014. In 2017, the Government, formulated an update to the Gold-2000 program referred to as the “Gold 2” program to support industrial gold mining (MRPAM, 2015).

As part of its economic recovery effort, the Government approved the Gold-2 program on January 19, 2017. The main goal of the program is to increase the amount of gold mined nationwide and to build up foreign exchange reserves through improving the legal environment, intensifying geological studies and explorations, supporting gold production, and improving technologies, creating effective environmental management and protection system, and improving artisanal gold mining and sales. The program aims to reach 25 t gold production by 2025 and increasing gold reserve by 100-150 t. The Gold-2 program includes specific objectives in relation to artisanal and small-scale gold mining (ASGM) (Government of Mongolia, 2017):

1. Improve technical standards used for artisanal gold mining, introduce low-waste technology, and establish a formal supply chain of artisanal gold;
2. Determine and register artisanal and small-scale mining areas nationwide;
3. Support the organization of artisanal and small-scale gold miners into legal entities through formalization and capacity building of partnerships, and to establish an effective system for imposing personal income and other taxes, fees and charges;
4. Register and evaluate the waste resources generated from gold mining;
5. Provide trainings on occupational safety, equipment usage and environmental rehabilitation to artisanal and small-scale miners; and
6. Support the participation of local ASM partnerships in utilization of waste deposits in areas where the license has been revoked and abandoned.

So far, implementation of the gold production under Gold-2 has been mixed so far with approvals of key mining legislation still pending and issuance of exploration licenses have been limited. With the exception of the ASM Regulation 151 which was approved in May 2017, other ASGM related objectives have not been realized. However, gold sold to the BOM has increased to 21.9 t in 2018. The resumption of royalty fee to 5% in 2019 led to decrease in gold sales to 15.2 t in 2019 but increased to 23.6 t in 2020 (Chapter 7).

Info Box 3: Mineral Resources and Petroleum Authority of Mongolia (MRPAM)

Mineral Resources and Petroleum Authority of Mongolia (MRPAM) is a government implementing agency under the MMHI. Its purpose is to support the administration of the mineral resources in formulating development policies. It provides information and advocates for a favorable environment to implement policy guidelines and increase investment in the Mongolian mining sector. MRPAM provides services related to exploration and mining licenses in order to implement the Minerals Law. This includes issuing the exploration and mining licenses to industrial mining. Additionally, MRPAM

Artisanal and Small-scale Gold Mining

Mongolia has traditionally been a livestock-based economy. ASM only emerged in the last 30 years. Transitioning to a market economy during the 1990s led to an increase in social disparity and considerable unemployment and underemployment. Mongolians who live in the countryside were particularly affected by high rates of inequality, exacerbated by extreme weather events, known as 'zud', and climate change. As a result, workers from other sectors were driven into ASM out of economic necessity (Levin Sources, 2017).

The number of artisanal gold miners in Mongolia fluctuated throughout the last two decades as well as seasonally. There is an estimation that more than 100,000-120,000 Mongolians (who indirectly support more than 400,000 Mongolians (about 15 percent of the population)) have been working in this sector since the early 2000s (World Bank, 2003 & 2007). Though this estimate seems high and is likely overreported, it shows the perceived prevalence of ASM as for Mongolians. However, due to the clandestine nature of ASM (most activity is carried out illegally/informally), and the fact that it is a seasonal activity (frozen earth during winter makes it impossible to mine), definitive estimates of the number of people involved are difficult to determine (Levin Sources, 2017).

In 2012, the National Statistics Office of Mongolia (NSO) carried out the first nationwide survey to establish a baseline on the ASM sector and to populate the database; the survey was repeated in 2016, enabling a comparison over the four-year period. Both surveys, which were funded by the SAM project (see the Info box 4), involved miners who have established ASM partnerships and cooperatives in accordance with the ASM regulation.

Info Box 4: Sustainable Artisanal Mining Project (SAM)

The Sustainable Artisanal Mining Project (SAM) of the Swiss Agency for Development and Cooperation (SDC) has been a major international project implemented in Mongolia from 2005 to 2019. The SAM project has contributed to the transition from environmentally harmful and dangerous ASM practices to sustainable and well performing ASM operations. The project resulted in a better legal framework, improved technology, and safety as well as the application of best practices of environmental reclamation, the development of ASM organisations, strengthened capacity and role of ASM NF as a strong advocate for miners' rights, enhanced knowledge, and capacities of central and local government on ASM management and governance and better

engagement and collaboration of diverse stakeholders (Government of Mongolia, 2020). Website: http://sam.mn/sustainable-artisanal-mining-project/

The 2012 survey, which did not differentiate between formal and informal miners, involved 13,375 artisanal miners. These miners operated at 238 deposits with mineral resources in 76 soums of 20 aimags and in one district of Ulaanbaatar. Of the 13,400 artisanal miners who took part in the survey, 10,500 (78%) mined gold, 1,400 (10%) mined coal, 1,000 (8%) mined fluorspar, 300 (2%) mined tungsten, 47 or (0.4%) mined tin, 10 or (0.1%) mined limestone, 100 (1%) mined precious stones, and 49 (0.4%) mined salt (NSO, 2013).

The 2016 survey covered 11,962 artisanal miners active in 332 sites belonging to 113 deposits or occurrences in 97 soums of 18 aimags and one district of Ulaanbaatar. Of these miners, 74% percent are engaged in gold mining, followed by fluorite and coal in almost equal shares (11% of ASM activities, respectively). Smaller quantities of limestone, gemstones, and wolfram are also produced through ASM, engaging 6% of the sector's workforce, while the production of development minerals can be found near both city and aimag centers (NSO, 2017).

As shown below in Figure 1-1, artisanal gold mining operations are active and dispersed in the western and central part of the country, while fluorite and wolfram ASM mines are concentrated in the eastern region.

According to the ASM NF (Info Box 5), there are 1,181 ASM partnerships with 10,671 miners from which 6,705 have land permits as of 2019 from which 86% of them are gold miners (ASM NF, 2019).

Info Box 5: Artisanal and Small-scale Mining National Federation (ASM NF or the National Federation)

The Artisanal and Small-scale Mining National Federation is an umbrella organisation established in 2013 to respond to the emerging need of artisanal miners for the development of sustainable artisanal mining by improving the sector's socio-economic impacts, promoting positive public attitudes towards ASM, and promoting safe working conditions. Since its inception, the National Federation has made significant progress in members' contributions and commitment. Today, it has 7,500 members in 15 aimags as of 2018. It regularly provides capacity building trainings to its members and advocates for the improvement of the sector (ASM NF, 2020).

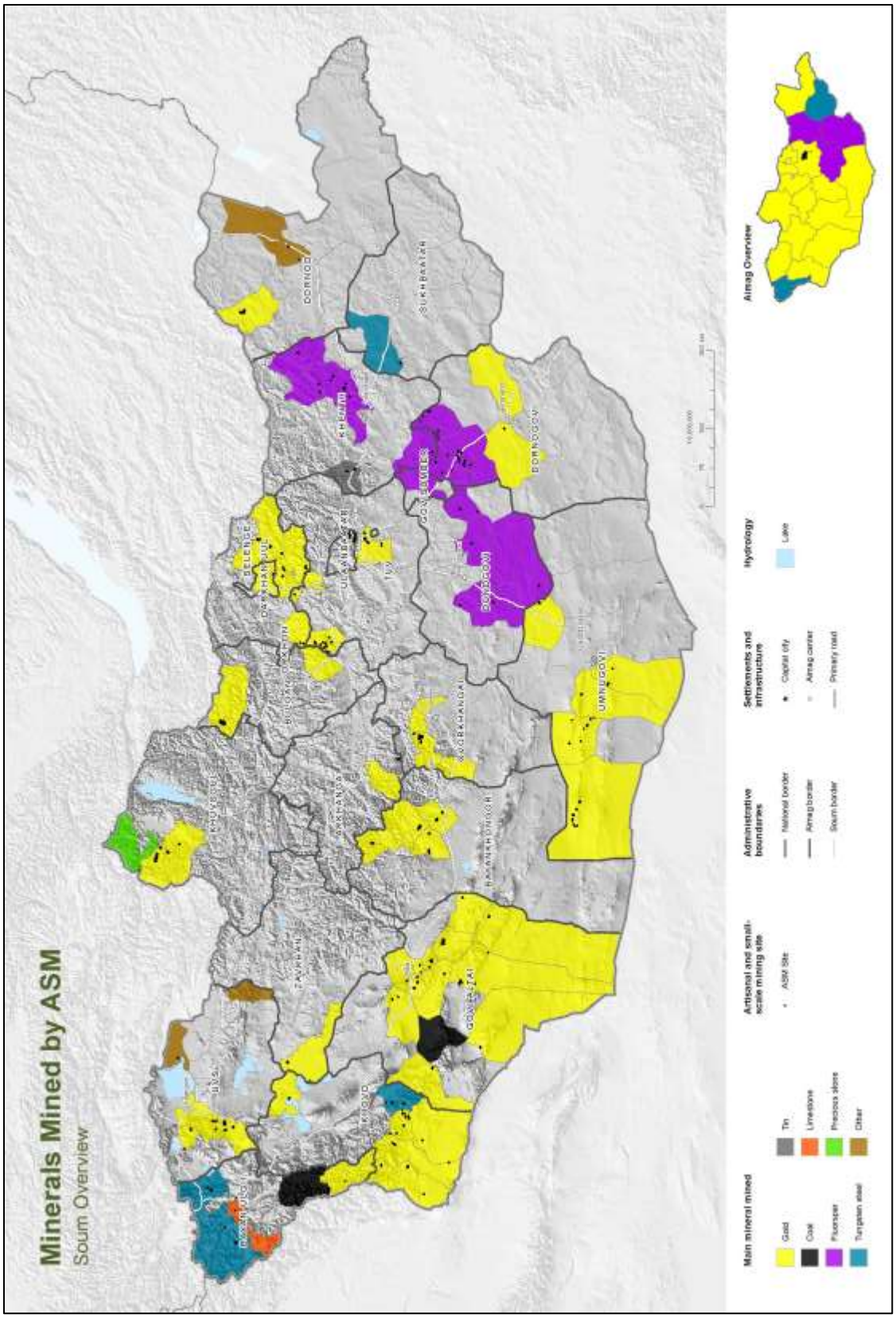


Figure 1-1. Minerals mined by ASM in Mongolia (CDE, 2015)

1.2 Study Relevance and Objectives

During the project preparatory grant (PPG) phase, several studies on mercury use, environmental management, gender aspects and financial flows in the ASGM sector in Mongolia were completed. However, not all of these studies covered the proposed project sites, nor did they cover all relevant topics such as training needs of miners. Therefore, the data gathered and analysed through these studies was found insufficient to serve as baseline data for this project and to guide project activities especially in the areas of environment, formalization, gender, mercury use and capacity building. Thus, this study was conducted to provide adequate, complete, and consistent baseline data across all five selected project sites and their administrative areas to inform further project activities.

The main goal of this study was to conduct a baseline analysis in the five study areas covering the following major components:

- Socioeconomic baseline survey: Documentation of basic socioeconomic characteristics of artisanal miners including education, age, marital status, access to social services and insurance cover, primary and secondary employment and income and organizational affiliation in artisanal mining (Chapter 2).
- Formalization status: Identification of the challenges artisanal miners or organizations face in complying with existing national legislation, regulations, standards, and local government policies (Chapter 3).
- Current mining practices: Assessment of current prevailing mining practices and legal compliance with technical mining practice, environmental practices, and rehabilitation as well as occupational health and safety practices (Chapter 4).
- Mercury use: Identification of the existence of and compliance to regulations regarding mercury use and disposal in gold extraction (Chapter 5).
- Gender mapping: Development of a gender profile of the ASGM community covering socioeconomic characteristics of women and men miners, gender dynamics in the artisanal gold mining sector (e.g., level of organization, gender division of labour, power dynamics and leadership, access to and use of resources), gender specific challenges for women in the sector, and gender dynamics in the domestic sphere including gender division of domestic labour and decision making (Chapter 6).
- Gold market: Assessment of the gold supply chain, the estimation of volume of gold produced and ore extracted by artisanal gold miners, as well as access to finance for artisanal miners (Chapter 7).
- Training needs: Assessment of existing knowledge regarding mining practices and legal frameworks, identification of training needs and analysis of the current use of different information channels (Chapter 8).

The specific objectives are identified as follows:

- To provide the project with data to assess the current state of the study areas and use these as a baseline for monitoring the project progress and results;

- To identify the training needs of artisanal miners and government officials within the framework of ASGM formalization, supply chain management, environmental and social monitoring, traceability, legal, administration and gender issues;
- To identify major issues that need to be addressed while planning and implementing the project activities in the project sites; and
- To derive recommendations for key stakeholders in the ASGM sector on how to improve mining practices in the sector, including the reduction of mercury use and improvement of gender equality.

1.3 Study Design and Methods

For this contextual study, a mixed methods approach was applied, combining data from a quantitative survey (questionnaire, see Annex A), qualitative key informant interviews (interview guidelines see Annex B), an in-depth study on gender issues (methodology and guiding questions see Annex D) and a literature review.

Table 1.3-1. Overview of methods employed for primary data collection

Method	Target Population	Research Topics Covered
Quantitative Survey	371 artisanal gold miners in 5 study areas	- Socioeconomic information - Legal frameworks - Ore extraction, transportation and processing - Gold production and supply chain - Occupational and technical safety - Environmental practices - Capacity building and information sources - Work roles and decision making - Mercury use - COVID-19 impacts Total of 126 questions, see questionnaire Annex A
Key Informant Interviews	73 interviews with national and local key stakeholders: - Government stakeholders from relevant departments - NGOs - Local community representatives - Various experts along the gold supply chain See Annex B for overview	- Status quo of the ASGM sector in Mongolia and in study areas and challenges - Relevant legal frameworks, implementation and compliance - Mercury use - Gender related challenges and gender mainstreaming - Access to social services - Training needs - Technical aspects of current practices - Gold trade and supply chain - Capacity of local processing plants

		- Environmental management and rehabilitation Guidelines see Annex C
In-depth Study on Gender	30 women miners in 5 study areas	- Main challenge and advantage for women miners in ASGM - Decision making and control over resources - Occupational health issues - Knowledge gaps and training needs - Gender-based violence and discrimination Methodology see Annex D

Quantitative and qualitative data collection tools were designed to allow data triangulation between different stakeholder groups and methods. However, some specific topics within components outlined above were only addressed in specific methods. For example, after conducting a pilot survey with 20 artisanal miners to test the feasibility of the quantitative survey tool, the test study results showed that miners had limited knowledge on legal frameworks, gold extraction process and measurement, gold supply chain, etc. Hence, specific information on legal frameworks or technical processing was only included in interviews with leaders of mining organizations as they are responsible for management, sales, and logistical coordination. Furthermore, gender-sensitive topics such as gender-based violence were not addressed in the quantitative survey but only in key informant interviews and the in-depth study.

Study Sites

This study covered five project sites in four soums (soum = sub province) and one village, located in three different aimags (aimag = province) (Figure 1-2):

1) Bayangol soum in Selenge Aimag (hereinafter referred as “Bayangol”),
2) Mandal soum in Selenge Aimag (excluding Tunkhel village) (hereinafter referred as “Mandal”),
3) Tunkhel village in Mandal soum (hereinafter referred as “Tunkhel”),
4) Yusunbulag soum in Gobi-Altai aimag (hereinafter referred as “Yusunbulag”), and
5) Altai soum in Khovd aimag (hereinafter referred as “Altai”).

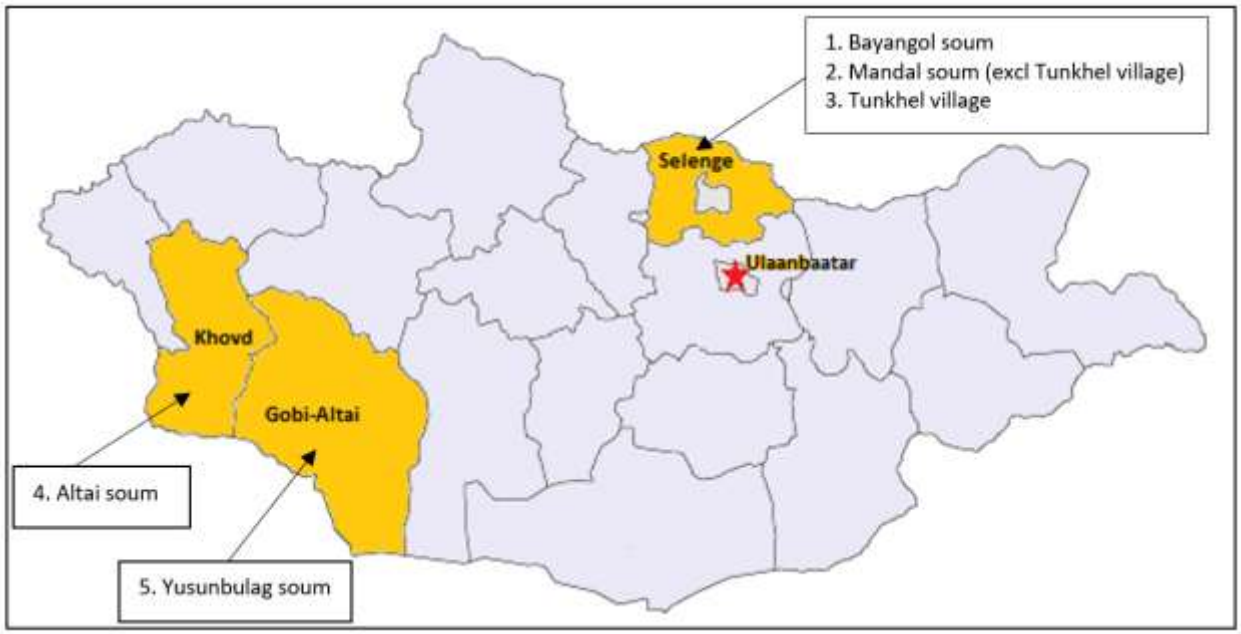


Figure 1-2. Map of the five project sites

The project sites were identified during a structured site selection process including nine sites in Mongolia, conducted by the planetGOLD Mongolia team together with staff from the AGC in November 2019. Each of the mining sites were assessed according to seven composite criteria which included government support, technical requirements, potential ASGM beneficiaries, mercury use, gold trade and due diligence, financial needs as well as security and safety of ASGM sites. The two sites with the highest scores, Altai and Tunkhel, were selected as primary project sites in which mercury free processing systems will be implemented. Since the assessment team identified many needs and opportunities to improve the ASGM sector in general, it was recommended and approved by the Project Steering Committee that project activities such as workshops, training and capacity building should also be carried out in other three project sites identified in the main Project document: Yusunbulag adjacent to Altai, Mandal as superordinate soum of Tunkhel, and Bayangol adjacent to Mandal.

Study Population

For the purpose of this study, a clear definition of the target population was developed in order to clarify what segments of artisanal gold miners would be targeted. This ensured consistency in selection and classification. Participants were asked to self-identify based on their membership status with an artisanal mining organization. The study identified 5 groups, of which 3 were categorized as formal miners and 2 as informal or illegal miners (see Section 3.4 for further information on formal status).

(1-3): Formal artisanal miner: A formal artisanal miner is a person who is above 18 years old, registered as a citizen of the respective aimag and soum where he is working as a miner. A formal artisanal miner is also a member of one of the organizations outlined below. In addition, the formal miner has entered into a contract with the soum governor of the area where the MRPAM has issued a Land Conclusion, an official document

confirming that the land is feasible for ASM extraction (see Section 3.4). Formal artisanal miners of the study population could belong to any of the 4 following organizations:

i. **Registered partnership**: a mining group that is affiliated with a legal entity and/or has registered with the local and/or aimag government registry office. For a partnership, agreement on incorporation serves as the basis for its operations They usually have access to better technology and equipment and are required to comply with relevant laws.
ii. **Unregistered partnership:** a mining group that is formed based on a joint action contract with the members of the unregistered partnership, as required by the Civil Law of Mongolia, but not necessarily registered as a legal entity with a local or regional government. Since the group is not legally registered, access to funding and new technology is challenging and the group may not comply with relevant laws.
iii. **Cooperative:** a legal entity that is jointly established by several persons for the purpose of meeting their common economic, social and cultural needs, founded on a voluntary basis, with unified, democratic and joint management and oversight, with operations based on shared assets. For the cooperative, endorsement of by-laws serves as the rationale for official registration by government authorities.
iv. **ASM NGO**: an organization that is established by artisanal miners on a voluntary basis with the purpose to protect and express interests and opinions of its members. Members of an ASM NGO can be members of an unregistered or registered partnership or they can be individual miners.

(4) Informal artisanal miner: An informal miner is a locally registered citizen who is affiliated with a formal organization but works without any contract with the respective soum governor or has no Land Conclusion from MRPAM. Hence, informal miners work on informal, unpermitted mine sites.

(5) Illegal miner: An illegal miner includes a person or a group of people who do not belong to any formal organization, hence work illegally, and do not comply with local or regional laws or zoning restrictions, including excavation within specially protected natural zones with a high environmental impact.

This classification is to a certain extent artificial since miners cannot always be easily assigned to one group (see Section 1.4) and their status can change. An example of how their status may change could be whether a contract with a local authority is being renewed or not. Since the formal status of a miner can therefore be subject to change, the formality status can be interpreted as a continuum from informal to formal, rather than two opposite categories. Miners can also be grouped according to their level of organization, with the first four groups being classified as organized miners, and illegal miners as unorganized miners. Due to the changes that can occur in formal status, this classification was also used for the sampling strategy. In addition, different data sources and methods were used to assess the number of miners for the different groups.

Sampling Strategy

For the quantitative survey, the sampling frame, i.e., the total number of organized and unorganized artisanal miners in the 5 project sites (hereinafter referred as "study areas"), was assessed by reviewing several recent studies on artisanal mining. It was determined that the NSO survey conducted with the financial support of Swiss Development Cooperation's SAM project in 2016 provided the most adequate sample size reference for organized miners. Based on this information, local non-governmental organizations (NGOs) and Artisanal and Small-scale Mining National Federation (ASM NF) were contacted to obtain the latest information on the number of artisanal gold miners at the study areas. The ASM NF supplied the number of partnerships (including NGOs) and their members in the study areas as identified below. The number of unorganized miners was estimated based on prior research and discussions with local officials (Table 1-2).

Table 1.3-2. Sampling frame: Number of partnerships, partnership members and estimated number of unorganized miners by study area

№	Aimag	Soum/Village	Organized miners		Unorganized (illegal miners) miners
			Number of partnerships	Number of members	Estimated number of unorganized miners
1	Gobi-Altai	Yusunbulag	22	214	500 – 1,000
2	Selenge	Bayangol	27	108	300
3		Mandal (excl. Tunkhel)	32	189	500 – 800
4		Tunkhel	8	180	300 – 500
5	Khovd	Altai	11	99	500 – 1,000
TOTAL			**100**	**790**	**2,100 – 3,600**

A limitation of the sampling frame is that it can take only those miners into consideration who do mine in the same soum where they are registered, as miners have to register in a soum if they live there for more than six months. Some miners do temporarily migrate to other soums to work at mining sites, but do not register there. For example, while Yusunbulag has a high number of artisanal miners and processing facilities, it does not have permitted mining sites. Hence, the respondents in this group went for ore extraction to Altai in the same province (hereinafter referred as "Altai, GA"), and processed the ore in Yusunbulag.

For the organized miners, a sample pool of 100 permitted partnerships and 790 partnership members (no gender-disaggregated available) was identified for the study areas. However, this number did not ensure the exact number of miners working at the sites due to the irregular work schedules and seasonality in the ASGM sector. In addition, about 15% of registered members are non-miners providing administrative and management support to NGOs and partnership members.

For the unorganized miners, the sample pool was estimated to consist of 2,100 to 3,600 miners. However, these estimates have their limitations due to unclear information of their numbers, the irregular work schedule of unorganized miners and the challenges in locating and eliciting their cooperation.

A purposive sampling approach was chosen to cover the five pre-identified groups of miners in the study areas, differentiating respondents according to organizational

affiliation (organized versus unorganized miners), role (member versus leader), and gender. Based on an estimated 25% to 30% of women in the sector, it was targeted to interview at least 25% of women miners. While a quota sampling approach had initially been planned for the survey, with predefined numbers of respondents per categories outlined above, this approach had to be abandoned during the data collection process due to the availability of miners (see limitations, Section 1.4).

In total, 371 respondents were interviewed during the survey (Table 1-3). Out of these, 81% were organized miners, 27% were women (Table 1-4), and within the group of respondents belonging to partnerships or NGOs, 83% were members and 17% were leaders.

Table 1.3-3. Sample size based on formal status, organizational affiliation and member status, by study area

Organizational status		Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	Total
Organized miners	**Registered partnership**	**21**	**84**	**39**	**20**	**33**	**197 (53%)**
	Member	19	73	34	17	28	171 (46%)
	Leader	2	11	5	3	5	26 (7%)
	Unregistered partnership	**10**	**6**	**11**	**6**	**1**	**34 (9%)**
	Member	8	5	10	5		28 (8%)
	Leader	2	1	1	1	1	6 (2%)
	ASM NGO	**1**	**7**	**16**	**27**	**0**	**51 (14%)**
	Member	0	4	13	19	0	36 (10%)
	Leader	1	3	3	8		15 (4%)
Unorganized miners	**Informal miners**	**9**	**4**	**3**	**1**	**0**	**17 (5%)**
	Illegal miners	**11**	**11**	**2**	**8**	**40**	**72 (19%)**
	Total	**52**	**112**	**71**	**62**	**74**	**371**

Table 1.3-4. Sample size, by study areas and gender

	Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	Total
Women miners	15	28	20	23	14	100 (27%)
Men miners	37	84	51	39	60	271 (73%)
Total	**52**	**112**	**71**	**62**	**74**	**371**

Respondents for the key informant interviews were selected based on a purposive sampling strategy, with the objective to cover key stakeholders at the national level and the local level of the study areas that are in charge of sector related activities (e.g., national and local environmental officers), had a deep knowledge of the sector due to their roles (e.g., gold trader, processing plant owner) or were involved in improving the sector (e.g., NGOs). A total of 73 interviews (incl. 35 with female informants) were conducted: 5 in Ulaanbaatar, 6 in Selenge (Sukhbaatar soum) aimag, 12 in Bayangol, 12 in Mandal, 7 in Tunkhel, 19 in Yusunbulag (Gobi-Altai) and 12 in Altai and Jargalant[16] soum (Khovd).

For the in-depth study on gender, potential interview partners were identified during the quantitative survey, based on their interest in the gender topic, experience and

[16] Jargalant soum is the capital of Khovd aimag and provides policy support and monitoring for all soums within the aimag; Hence, policy makers of Jargalant soum were included in KIIs.

information to share on gender in ASGM and/or increased level of awareness on the topic. In total, 30 women miners were interviewed.

Data Collection and Processing

For the quantitative data, in-person interviews were conducted in the study areas, using a paper-based questionnaire to facilitate the fast recording of open answers and additional notes (Annex A). During the data collection, each team had a supervisor to ensure data quality. Virtual debrief meetings with the teams working in the three aimags and supervisors were held at the end of each day to discuss the field work progress and resolve issues. After field data collection was completed, the data was entered, cleaned and converted from CsPro to SPSS, and the results distributed to the project experts for analysis and interpretation (Figure 1-3).

The data was coded according to the survey question structure. For open ended questions, additional steps were taken prior to coding. The responses were reviewed by the data collection team and formatted then into individual statements. The statements were then reviewed for similarities in theme and clustered into a response category for inclusion and analysis. Unique responses were categorized under the "other" category.

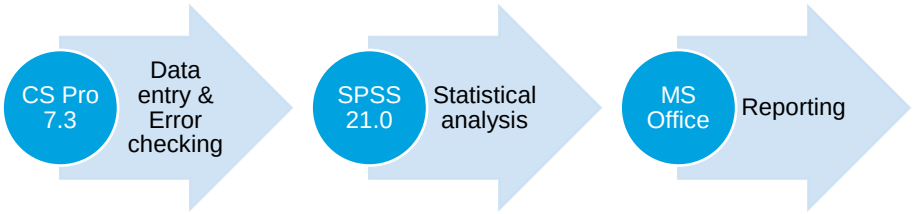


Figure 1-3. Data management process

Qualitative data was collected through Key Informant Interviews (KIIs) with national and study area stakeholders. Interviews were conducted by team leads, specialists and senior data collection managers to ensure accuracy of the results. An official letter was prepared introducing the goal of the survey and inviting key representatives from the local or national organization to participate in the survey as key informants. Interviewers made appointments to visit the organizations, took notes and when permitted recorded the interviews. After the data collection phase, all interviewers transcribed the recordings, when available, or used the field notes when recording was not permitted, to develop the final interview transcript. Annex C contains the guiding questions used for different stakeholder groups and Annex B lists the organizations and groups included in the KII sessions.

Data Privacy

To stimulate greater openness and participation in the research process, certain steps were taken during data collection, data entry and analysis to ensure the anonymity of the respondents and confidentiality of the data. Targeted questions were limited to individual surveys and key informant interviews to protect the anonymity of the participants. All survey data was recorded anonymously, i.e., without any person identifiable information,

and as the opinion of individuals; hence, data was also automatically recorded disaggregated by gender.

1.4 Challenges and Limitations

Due to the itinerant [nomadic] and quasi-legal state of artisanal mining, there are challenges in locating active sites and soliciting information from workers and management. The year of 2020 has presented several unique challenges in relation to data gathering.

Challenges Regarding the Data Collection

- The outbreak of COVID-19 has had a significant impact on Mongolia, the miners, and the execution of the project. In an effort to contain the pandemic, the Government of Mongolia increased existing restriction on March 13, 2020, including a complete border closure and a ban on all regional and inter-city travel from March 13, 2020. These internal travel restrictions were gradually repealed from May 1 till September 15. This caused delays in the planning and execution of the surveys and interviews, which resulted in overall project delays.
- Due to the COVID-19 related delays, the field survey had to be scheduled from June 15 to July 2. This was before the Parliamentary Election on June 23rd and the national Naadam holiday from July 11-15. Since the period before the election is a period of hyper attention to local activities and an increase in legal enforcement by local and national agencies, most of the sites were inoperative due to concerns regarding visits and inspections by local environmental inspectors and ecological police officers. Also, miners were required to return to their home soums to vote, making it difficult to find permitted miners and partnership leaders.
- Focus group discussions had been planned for specific topics such as gender but could not be conducted since the Government prohibited all events and gatherings of people nationwide due to the COVID-19.

Sampling Strategy and Influencing Factors

- In Selenge aimag, all of the mining operations were closed due to inspections conducted by local ecological police officers. Residents and miners were unwilling to participate due to fear of prosecution. It was also indicated that no annual permits had been issued for 2020 due to the Resolution 355 (Chapter 3), forcing the legal partnerships to disband and find alternatives.
- Gobi-Altai aimag has seen a reduction in mining due to a perceived decline in viable mineral deposits, making it difficult to locate active miners, a situation exacerbated by the election and enhanced scrutiny.
- Interviews were conducted in soum/bagh centers and not at mine sites, therefore the site-specific data provided by participants could not be verified. Many of the miners were unwilling to identify where they were mining, making on-site verification impossible.

- It is likely that miners did not reveal that they were mainly mining in another soum, due to fear of legal prosecution. Hence, it is possible that miners identified as subjects of one of the five study areas have an ore extraction source outside the defined area.

Secondary Data Availability

- Although some of the secondary demographic data could be disaggregated by gender for the study areas, there is limited disaggregated data for income, employment vs. unemployment and education for those soums. Soum authorities do not disaggregate data by gender and there is no database available for this purpose.
- Mongolia has very limited geological and exploration information that is publicly accessible, and what is accessible is geared towards large-scale mining deposits. Formal ASM sites are required by law to mine in abandoned large-scale sites or areas deemed to be insignificant for LSM development. Soums do not have relevant reference maps of their region available, making it difficult for artisanal miners to identify where potential deposits are located. This also makes it difficult for the project to determine how to locate potential mine sites that are not officially registered, since there is no common geographical source of information.
- Tunkhel village is the 5th district of Mandal, creating a secondary data challenge. Since most secondary data is available at the soum level, any information would include Tunkhel bagh within the Mandal data set.

Information Bias

- Some miners indicated they had criminal records or had been previously arrested. Hence, some miners were hesitant to provide any information that could have been seen as incriminating. This potentially skewed the results and made it difficult to achieve sampling targets. This especially applies to information pertaining legal status and mercury use.
- Khovd aimag had recently had an increase in legal enforcement with most of the miners indicating they have been arrested and released on parole, making them very hesitant to answer processing questions. Also there has been unknown delays in the annual permitting process resulting in permits not being issued and forcing some miners to work informally.
- Currently, miners are divided into two categories, such as individual illegal gold miners (so called ninja miners) and small-scale miners (NGOs, partnerships and cooperative). We developed definitions on miners' formalization status (formal, informal, and illegal) for the first time to use in this survey. However, during the survey, miners tended to avoid revealing their illegal status and classified themselves rather as informal. Thus, it should be noted that miners who identified themselves as formal or informal, might actually be illegal miners.
- The knowledge of artisanal miners on certain topics such as mining practices, compliance with legal frameworks, ore and gold production data, etc. differed. While the questionnaire had been tested in a pilot study to test its feasibility, it cannot be ruled out that miners answered questions without knowing the answers, based on social expectancy bias.

Limitations of the Research Questions

- The study did not address child work or child labour in artisanal gold mining, nor did it include the number of children of respondents and the presence of children at the mining sites. However, child work was also not observed during several site visits of the planetGOLD Mongolia team. Only one respondent in Altai from the in-depth study mentioned child work as a problem. Other reports indicate that child work remains a problem in Mongolia's informal ASM sector (Asia Foundation, 2013). The ILO 2015 estimates that more than 21% of informal gold miners are children, with increasing numbers during school holidays. The NSO survey (NSO, 2017) found out that 188 children under 18 years old were working in the ASM sector, including 36 children in gold mining. Of these children, 61.8% were working during the school holidays and 34.2% were working during non-school hours and the remaining were working throughout a year.
- Migration status of miners was not assessed due to the sensitivity of the information. Migration status is especially important to understand access to services since a miner has to be registered in the aimag where he or she is working. However, since organized miners have to register after 151 days in the aimag where they are working as miner, this only applies to illegal miners.
- This study only looked at hard rock mining and results cannot be transferred to the alluvial gold mining sector in Mongolia. Women, for example, tend to be more prominent in alluvial mining (Asia Foundation, 2013).
- The contextual study had the objective to provide a baseline for mercury use in the study areas. While primary data for the relevant variables was collected in the study areas, it was not possible to derive a reliable estimate based on several methodological limitations discussed in Chapter 5.

2. Socio-economic Aspects of the Study Areas

This section aims to provide a brief description of the socio-economic background of the target aimags and soums, and to describe the demographic and socio-economic characteristics of the artisanal miners at the study areas. This includes information on the age, gender, marital status, education, employment and income level of the respondents, as well as access to social services and the impacts of the COVID-19 pandemic on their livelihoods.

2.1 Population and Socio-economic Profile of the Target Aimags and Soums

The five study areas are located in three aimags (provinces) in Mongolia (for a map see Figure 1-1): Selenge aimag in the north of the country, Khovd and Gobi-Altai aimags in the west. The population size of the aimags and soums is presented in Table 2.1-1. Amongst the five areas, Mandal and Yusunbulag have the highest population and the highest population density. In terms of the gender ratio, there is no significant difference in population between men and women.

Table 2.1.1-1. General population of target regions, by gender (data source: NSO, 2020)

Regions	Population	% to country total	Women %	Population % (to corresponding aimag)
Gobi-Altai aimag	57,479	1.8%	50%	100%
Yusunbulag soum	18,444	0.6%	51%	32%
Khovd aimag	88,078	2.8%	50%	100%
Altai soum	3,318	0.1%	51%	4%
Selenge aimag	107,755	3.4%	49%	100%
Bayangol soum	5,567	0.2%	48%	5%
Mandal soum (Tunkhel bagh included)	27011	0.8%	49%	25%
Tunkhel village	3042	0.1%	48%	3%
Country total	3,197,020	100%	51%	N/A

Selenge Aimag

Selenge aimag is located in the northern part of the country. The main economic activity is agriculture; the aimag provides about 45% of Mongolia's grain and has over 1,6 million livestock. The working age population constitutes 65% of the population. Men are more active on the labour market, making up 55% of it (NSO, 2020). Selenge aimag is one of the most active regions for artisanal gold mining. Since 1997, people have been mining gold near the Boroo gold mine in Bayangol soum. As of 2014, 197 mining companies operated in 13 soums of the aimag. There are several large-scale mining (LSM) companies operating in the territory of Mandal and Bayangol soums including Puram LLC and Boroo LLC.

Bayangol soum of Selenge aimag: Bayangol soum is located 156 km from Ulaanbaatar city and 170 km from Sukhbaatar, Selenge's capital city along the main highway and railway

which connects the northern aimag to the south. Of the total soum population, 61% were of working age in 2019. The soum economy is based on livestock and crop production businesses. It is one of the soums with the highest number of livestock in Selenge aimag and provides about 10% of the national wool production (SASD, 2020). Bayangol is one of the regions where artisanal gold mining started in Mongolia. Women and men miners have been mining gold near the Canadian owned Boroo gold mine of Bayangol soum since 1997. There were 65 licenses issued for large-scale companies, and 40% of which are mining licenses, with 5 companies currently active as of 2020 (KII, 2020[17]). Artisanal gold mining has become a major source of livelihood for local people with at least one person per household actively participating in mining, as informed by the governor office.

Mandal soum of Selenge aimag: Mandal soum center is located 220 km from Sukhbaatar, and 174km from Ulaanbaatar city. Mandal is the largest soum in Mongolia that is not a capital of an aimag with a reported population of 27,011 as of 2019. That same year, the working age population totaled 16,717 people, which made up 62% of the total working age population in the aimag. The soum has a total land area of 484,373 hectares, of which the majority is prime agricultural and cropping land. It provides 21% of the total vegetable production of the aimag (SASD, 2020). Artisanal gold mining has become one of the primary livelihoods in this community and the soum Governor's Office (KII, 2020) stated that they are actively working to support and organize the sector. According to the Governor's Office, there is one large-scale mining license and about 1,000 artisanal gold miners based in the soum.

Tunkhel village, Mandal soum, Selenge aimag (photo taken by planetGOLD Mongolia)

***Tunkhel village of Mandal soum**:* Tunkhel village is an administrative unit of Mandal soum located 150 km north of Ulaanbaatar and 40 km from the soum center. The village has a working age population of 1,400 people, of which 250 people have permanent jobs and about 650 are identified as unemployed. Many of the villagers started mining during times of economic hardship. Apart from the traditional rural livelihoods of herding and agriculture, the main employers are timber entities in the village. The timber entities offer seasonal work, twice per year and employ approximately 300 to 400 people. Hard rock ASGM operations began informally in Tunkhel around 2007 at the Bulag mining site. The site is currently recognized as a formal artisanal and small-scale mining concession and operation.

Gobi-Altai Aimag

Gobi-Altai is the second largest aimag in Mongolia with a total land area of 141,400 sq.km; it is located in the southwestern part of the country. Of the total population, 27,151 or 47%

[17] All direct and indirect quotes from Key Informant Interviews (KII) have been anonymized in the report to guarantee anonymity of the respondents. Gender, function/title, and location (soum/aimag) are only specified to a degree that allows the anonymity of the respondent.

were economically active in 2019. The aimag has over 3.5 million livestock which generates 44% of the aimag's GDP (GAASD, 2020).

Within the aimag, there are 145 mining companies for various minerals with exploration and mining licenses for alluvial and underground mining activity. Currently, only five companies are operating, including two alluvial gold extraction companies, with sites in Biger, Tonkhil and Yusunbulag soums (Nyambayar, 2019). Altain Khuder LLC, an iron-ore mine in Biger soum is the largest mine employing about 600 people, 200 of which are locals (GAASD, 2020).

Yusunbulag soum of Gobi-Altai aimag: Yusunbulag is the aimag center, located 1,001 km from Ulaanbaatar with mostly paved roads. The soum has a total population of 18,456 residents, which represents one-third of the total population in Gobi-Altai aimag. Most business and service centers are located in the soum, which includes over 50% of the total business entities of the aimag (GAASD, 2020). There is no permitted ASM land in Yusunbulag soum, but there are two ore processing plants. Only the "Zamiin Am" hard rock artisanal mining site is operating in Altai soum of Gobi-Altai aimag (hereinafter referred to as "Altai, GA"). The "Zamiin Am" (5.7-hectare area) site is located 60 km from the soum center and was operational from 2017 up until March 2019. However, it is closed due to resolution No.355 (see Chapter 2) as well as its challenging working conditions, requiring additional infrastructure (GAASD, 2020).

Zamiin Am mining site at Altai soum, Gobi-Altai aimag (photo taken by planetGOLD Mongolia)

Khovd Aimag

Khovd aimag is located 1,580 km west from Ulaanbaatar and is distinguished by its multicultural population. It is home to more than 17 nationalities and ethnicities. The local economy of the soums primarily depends on agriculture, especially vegetable farming and animal husbandry. There is a total population of 89,712 residents living in 22,513 households. The working age population constitutes 44% of the total population in the aimag (KASD, 2020).

According to the local government, there are about 560 artisanal miners in the aimag with 23% organized into formal ASM organizations, whereas 78% operate as informal miners as of 2017. Aimag and soum level local governments admitted that there are informal mining activities and stated that they are supportive of formalization for ASM organizations since they can make an important contribution to the local residents' livelihoods (KII, 2020).

Altai soum of Khovd aimag: Altai soum has undergone infrastructure improvements, and a newly established 300 km long paved road now connects it to the aimag center. Due to the high altitude of Altai soum, people are not able to carry out extensive agricultural activities compared to other soums and are only able to engage in animal husbandry with artisanal mining as an alternative source of income. The soum has a population of 3,318 residents of which 66% are of working age (KASD, 2020). Since artisanal mining provides employment and income for the community, the soum government is supportive and tries to organize and formalize the miners. It also requires them to pay income taxes. According to the local ASM aimag association, local miners have been organized into formal ASM organizations since 2017. Ten partnerships have been established with 80 members. In September 2019, two of these partnerships received land permits for the 'Maikhan 1' and 'Maikhan 2' locations (KII, 2020).

Maikhan mining site at Altai soum, Khovd aimag (photo taken by planetGOLD Mongolia)

Comparing the extraction and processing infrastructure of the five study areas, Mandal soum and Tunkhel village both have processing plants and artisanal mining sites while Yusunbulag soum only has processing plants operational for the processing of ores from Altai soum of Gobi-Altai aimag and other neighbouring aimags. Bayangol soum does not have any processing plants and artisanal gold hard rock mining sites and has only illegal mills, processing ore extracted illegally within the soum, but also from other areas. Altai soum of Khovd aimag has artisanal gold mining sites extracting ore, however there is no processing plant in the entire region.

2.2 Demographic Characteristics of the Respondents

Of the total 371 miners surveyed, men constituted 73% (n=271) and women 27% (n=100) of the respondents, taking into account that women represent around 25 to 30% of the work force. Figure 2-1 shows that most of the miners are within the 30-55 age range with a rather equal distribution between the age groups of women and men, considering the smaller number of women miners in the survey population as well as in the sector in general. The pyramid shows a surplus of men in the age group 18 to 29, which correlates with the higher number of unmarried men miners. Women, on the other hand, are relatively more often presented in the age group above 54.

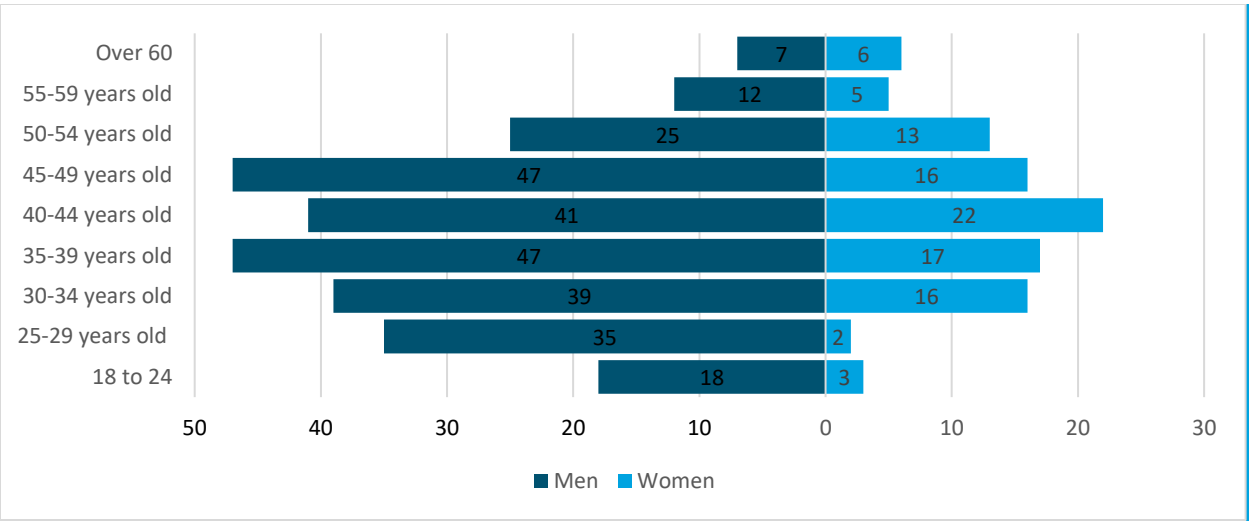


Figure 2-1. Age and gender distribution of survey respondents (n=100 women and 271 men)

Of the total respondents, the majority were married (80%) and 14% were single (Table 2.2-1). The highest proportion of married miners (89%) was in Altai, followed by Tunkhel (86%) and Yusunbulag (86%). Opposite to this, the proportion of single miners was the highest at 21% in Mandal and the lowest at 8% in Altai, where the proportion of widows was found to be higher at 3% in comparison to the other soums. There was a slightly larger proportion of married women (87%) working in the sector compared to 78% of the married men. This can be linked to the tendency that women tend to enter the sector with their husbands or other family members.

Table 2.2-1. Marital status of respondents by study area, gender and total

	Regions					**Total**		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Single	15%	21%	10%	11%	8%	7%	16%	14%
Married	77%	71%	86%	82%	89%	87%	78%	80%
Co-habiting	4%	6%	3%	3%	0%	2%	4%	4%
Separated	2%	0%	1%	0%	0%	0%	1%	1%
Divorced	0%	0%	0%	2%	0%	1%	0%	0%
Widow	2%	2%	0%	2%	3%	3%	1%	2%

In the most recent World Bank study (2018), Mongolia had a fertility rate of 2.9 and a tendency to have large households. Among the survey participants (Figure 2-2), 72% of the respondents' family size consisted of 4 to 7 family members; Mandal had the highest share of smaller families, namely 2-3 household members at 33%, while Altai had the largest family size with 24% of the families having 6-7 household members.

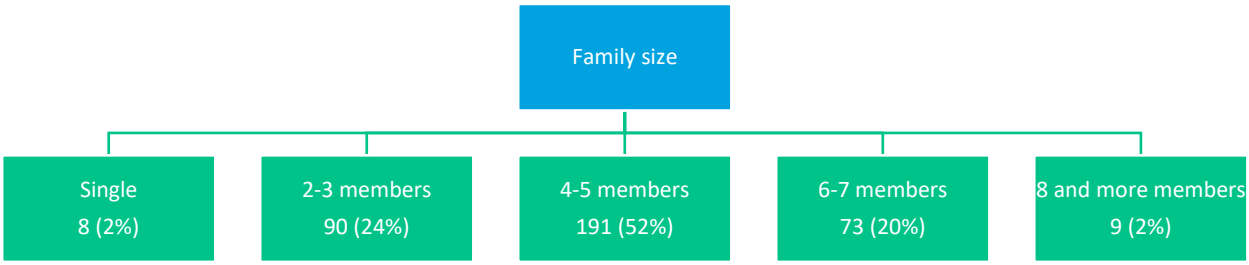


Figure 2-2. Family size distribution of respondents (n=371)

2.3 Socio-economic Profile of the Respondents

Artisanal mining provides a significant source of income for the rural poor in the study areas, especially for those who have no other options for supporting their families financially. In addition to providing necessary income, it also contributes to local economic development in the form of employment opportunities and income generation for supportive services. To determine the characteristics of artisanal and small-scale gold miners, it is important to understand their socio-economic background. This section provides an overview about the education level and housing types of the respondents, as well as income and employment sources.

Education

Of the surveyed miners, the majority (78%) had at least a high school diploma and 12% a bachelor's degree, whereas 4% had received only primary education or no education at all. Broken down by the target area, the proportion of miners with higher education is the highest in Altai (19%) and Mandal (12%). The percentage of miners with no education and primary or secondary education only was the highest in Tunkhel with 35%, compared to 11% to 25% in other study areas. In terms of gender, more women (88%) completed at least high school compared to men (78%) (see also Section 6.1).

Table 2.3-1. Level of education of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
No education	2%	2%	4%	2%	1%	0%	3%	2%
Primary school (1-4 grade)	0%	4%	1%	3%	1%	2%	3%	2%
Secondary school (5-9 grade)	17%	16%	30%	19%	9%	10%	21%	18%
High school (10-12 grade)	65%	61%	52%	63%	68%	67%	59%	62%
Vocational and others	6%	5%	4%	5%	1%	6%	4%	4%
Higher education (bachelor's)	10%	12%	8%	8%	19%	15%	10%	12%

Housing

Similar to the general pattern of housing types for the population across the country, over half of the miners live in houses and 39% live in ger. About 6% live in apartments and 1% in dormitories. Broken down by location, the number of miners living in houses is higher in Mandal (71%) and Tunkhel (85%) and lower in Yusunbulag (16%) and Altai (21%). Ger[18], the traditional dwelling, is a common type of housing in rural areas and the miners living in ger are higher in Yusunbulag and Altai, accounting for 81% and 69%, respectively.

Ger, a traditional dwelling in Mongolia (photo taken by planetGOLD Mongolia)

Table 2.3-2. Type of dwelling of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Ger	25%	19%	11%	81%	69%	38%	39%	39%
House	67%	71%	85%	16%	28%	55%	55%	55%
Dormitory	0%	2%	0%	0%	0%	1%	0%	1%
Apartment	8%	9%	4%	3%	3%	6%	6%	6%

According to the planetGOLD Mongolia team's observations made during the field survey, the residential areas on ASM mine sites are mostly gers or yurts, a traditional portable dwelling structure, and miners who work in shifts usually live in those temporary miners' camps, when working at the mine site. In total, around 44% of respondents indicated to work in shifts (see Section 4.1).

Employment

Out of the total miners surveyed, 50% indicated that artisanal mining was their primary occupation (Table 2.3-3). Out of these, 123 respondents (33% of the total survey population) did not have a secondary income. While the ranking of primary and secondary employment is based on several factors (e.g., formal contract job) and not necessarily on main income source, it is interesting to note that only 33% of miners listed artisanal mining as their only income, with large regional variations. Only 9% of miners in Altai live solely off their income generated from artisanal mining, but in Tunkhel and Yusunbulag the numbers are much higher at 45%.

[18] Traditional yurt that is a portable round tent covered with felt and used as a dwelling by people in countryside.

Table 2.3-3. Importance of artisanal mining as income source of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
ASGM as primary income	31%	66%	70%	60%	14%	49%	51%	50%
ASGM as only income	17%	41%	46%	45%	9%	36%	32%	33%
ASGM as secondary income	69%	34%	30%	40%	86%	51%	49%	50%

Primary Employment

From the 184 respondents (50%) who ranked artisanal mining as their secondary profession, 15% were self-employed and 13% had worked for either the government or private organizations and 7% were herders. In Mandal, Yusunbulag and Tunkhel, more than 55% stated that artisanal gold mining was their primary profession. Whereas Bayangol and Altai had the lowest percentage of respondents with artisanal mining as their primary occupation, making up 31% and 14% respectively. In Altai, respondents listed self-employment (24%), herding (23%) and government employment (14%) as their primary income source.

Table 2.3-4. Primary employment of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Artisanal gold mining	**31%**	**66%**	**70%**	**60%**	**14%**	**49%**	**51%**	**50%**
Government organization	0%	3%	0%	6%	14%	5%	4%	5%
Employed by private business	10%	1%	3%	10%	5%	6%	4%	5%
NGO	2%	6%	1%	3%	0%	3%	3%	3%
Self-employed	17%	13%	10%	11%	24%	13%	15%	15%
Farmer	12%	4%	0%	2%	3%	5%	3%	4%
Herder	6%	1%	6%	2%	23%	1%	9%	7%
Student	4%	1%	1%	0%	0%	0%	1%	1%
Retired	6%	3%	4%	2%	3%	10%	1%	3%
Unemployed	13%	3%	4%	5%	15%	7%	7%	7%
Disabled (with pension)	0%	1%	0%	0%	0%	1%	0%	0%

As for gender, there is a marginal difference between men (51%) and women (49%) who listed artisanal mining as their primary employment. Among those engaged in artisanal mining as their secondary employment, women with private businesses and farming are higher by 2 points than men while self-employment is more prevalent by 2 points among men. The data also shows that female respondents named retirement more often as primary income (10% versus 1%), and men herding (9% versus 1%).

Secondary Income Sources of Miners

From all respondents with artisanal mining as a primary income source (n=187, 50%), 66% had no other income source other than artisanal gold mining (33% of the total respondents). The most frequent secondary income sources for miners stated in the survey were self-employment (14%) and farming and herding (15%). Within this group, men reported more frequently a secondary income (63%) than women (73%). The highest number of artisanal miners without secondary income was found in Yusunbulag (76%) as stated in Table 2.3-3.

Table 2.3-5. Secondary employment of respondents with mining as primary income by study area, gender and total

	Region					Total		
	Bayangol (n=16)	Mandal (n=74)	Tunkhel (n=50)	Yusunbulag (n=37)	Altai (n=10)	Women (n=49)	Men (n=138)	Total (n=187)
No secondary income	56%	62%	66%	76%	70%	73%	63%	66%
Government organization	0%	3%	0%	0%	10%	2%	1%	2%
NGO	0%	1%	2%	0%	0%	2%	1%	1%
Self-employed	6%	14%	14%	19%	10%	6%	17%	14%
Farmer	13%	16%	10%	0%	10%	10%	11%	11%
Herder	13%	3%	4%	3%	0%	4%	4%	4%
Retired	13%	1%	4%	3%	0%	2%	4%	3%

The most frequently mentioned secondary income sources were private business (12%), livestock (9%), and agriculture (7%). Artisanal mining as the main income source was the highest in Tunkhel (87%) as well as Mandal and Yusunbulag (both 79%).

The survey did not investigate the pull and push factors for women and men to join the artisanal mining sector. Local government officials stated that loss of traditional income sources (e.g., losing livestock) and unemployment would be major drivers for men and women to enter the artisanal gold mining sector.

> *As for artisanal miners, frankly, they are those who don't have any other sources of income or who lost their livestock, and that's why they go to artisanal mines. These people should be supported by laws and regulations. To support their jobs and income-making opportunities, we are trying to support artisanal mining operations. Because these mines feed them. On the other hand, these citizens pay their social insurance and taxes which is a sort of investment from their side.*
>
> **KII, male officer in local administration office in Khovd aimag**

> *Jobless people with no income usually go for artisanal mining. Digging land, working with heavy equipment – all of this is hard work for women.*
>
> **KII, female officer in local administration office in Gobi-Altai aimag**

2.4 Work Organization in the Sector and Income

As stipulated in Clause 4.1.23 of the Law on Minerals, individuals who engage in artisanal mining are required to organize into either registered or unregistered partnerships or cooperatives (see Section 3.4). The organizational affiliation of miners, which determines their formal status (see Section 1.2, study population) has important implications for the miners, especially access to finance, capacity building and formal gold supply chains. At the same time, it also influences the communication and power dynamics between miners, local government stakeholders and authorities.

Organization

The majority of the interviewed miners were organized (81%), mainly within registered partnerships (53%) or ASM NGOs (14%) (Table 2.4-1). A total of 5% of miners belonged to organizations but currently work without contracts and were classified as informal miners (see Section 1-2). A total of 19% of the respondents did not belong to any formal organization and were classified as illegal miners. Comparing the study areas, Mandal has the largest share of miners linked to registered partnerships at 75%, followed by Tunkhel with 55%. Though Bayangol is considered to be one of the soums where artisanal mining first started, the proportion of miners linked to formally registered partnerships is lower than the average by 13%. Altai had the highest share of illegal miners, with 54% of all respondents. Artisanal mining is comparatively new in this area and only two partnerships have concluded an agreement with their soum governor on the land approved by MRPAM in 2019. Though Yusunbulag has the lowest share of registered partnership miners, it has the highest share of NGO miners which reveals NGO membership is as common as partnership membership among the miners in that area.

Table 2.4-1. Organizational affiliation of respondents in artisanal mining and membership status by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Registered partnership	**40%**	**75%**	**55%**	**32%**	**45%**	**49%**	**55%**	**53%**
member	*37%*	*65%*	*48%*	*27%*	*38%*	43%	47%	*46%*
leader	*4%*	*10%*	*7%*	*5%*	*7%*	6%	7%	*7%*
Unregistered partnership	**19%**	**5%**	**15%**	**10%**	**1%**	**13%**	**8%**	**9%**
member	*15%*	*4%*	*14%*	*6%*	*0*	10%	6%	*7%*
leader	*4%*	*1%*	*1%*	*3%*	*1%*	3%	1%	*2%*
ASM NGO	**2%**	**6%**	**23%**	**44%**	**0**	**24%**	**10%**	**14%**
member	*0*	*4%*	*18%*	*31%*	*0*	14%	8%	*10%*
leader	*2%*	*3%*	*4%*	*13%*	*0*	10%	2%	*4%*
Informal group	**17%**	**4%**	**4%**	**2%**	**0**	**3%**	**5%**	**5%**
Illegal miners	**21%**	**10%**	**3%**	**13%**	**54%**	**11%**	**23%**	**19%**

Gender disaggregated data shows that 86% of the women miners and 72% of men miners are linked to a formal mining organization. Relatively speaking, women are found in more NGO leader roles, making up 10% against 2% of male NGO leaders (see Section 6.2).

Working Positions Within the Mining Operation

Regarding the working position of the respondents within their mining operation, 54% of the total miners were employed as support workers, 32% as miners, 10% as shaft owners and the remaining 4% were classified as "other position" which included coordinators, partnership and NGO leaders, mill workers and gold traders. Table 2.4-2 shows that the ratio of miners and support workers varied between the five study areas, with the highest percentage of miners in Altai (59%) and support workers in Bayangol (75%). One possible reason for the low number of miners in Bayangol may be related to the fact that there was no land permitted for hard rock mining, but there were a few mills operating illegally.

Table 2.4-2. Position of respondents in ASGM by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Miner	15%	24%	27%	31%	59%	13%	38%	32%
Shaft owner	4%	8%	15%	13%	8%	9%	10%	10%
Support worker	75%	63%	52%	52%	31%	68%	49%	54%
Other	6%	4%	6%	5%	1%	10%	2%	4%

In terms of gender roles, men miners were more likely to work as miners (38% versus 13%) and women as support workers (68% versus 49%). The women who opted for 'others' mainly described their roles as coordinators and leaders of NGOs or partnerships (see Section 6.2 for a detailed analysis of gender division of labour in artisanal mining).

Work Experience

Of the total survey respondents, 44% of the total miners had worked for more than 10 years in the sector and 12% had joined the sector within the past year. Of the miners with more than 10 years of work experience, Tunkhel had the highest proportion at 58% and Bayangol had the second lowest proportion at 38%. Around one-third of the miners (35%) had joined artisanal mining within the past year. The group of female respondents had a higher percentage of women with more than 10 years of experience than male respondents; as noted more men than women had recently joined the sector.

Table 2.4-3. Work experience of respondents in artisanal mining by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Up to one year	35%	16%	10%	2%	3%	9%	14%	12%
1 to 5 years	23%	29%	20%	32%	38%	33%	27%	29%
6 to 9 years	4%	14%	13%	16%	23%	7%	17%	15%
More than 10 years	38%	40%	58%	50%	36%	51%	42%	44%

Income

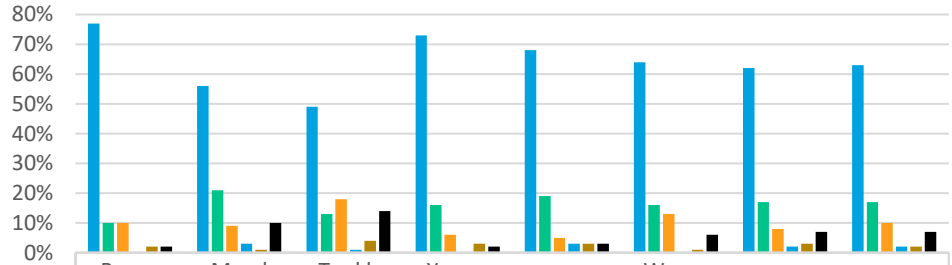
The average income in Mongolia is MNT 1,222,600[19] (447 USD) for men and 1,021,300 (372 USD) for women (Table 2.4-4) (NSO, 2019) but varies between the aimags, which also shows different gender-related income ratios. In the three target aimags, the average income is below the country average.

Table 2.4-4. Average salary and wages in target aimags and country wide in MNT

Aimags	Men	Women	Women % (compared to males)
Gobi-Altai	766,400	809,500	105.6%
Khovd	771,200	774,600	100.4%
Selenge	1,001,200	843,400	84.2%
Country average	1,222,600	1,021,300	83.5%

Overall Income

From the survey respondents, 67% had more than one income source (Table 2.3-3). At the five study areas, 63% of miners earn less than the national average, considering not only income from artisanal mining but also other income sources (Figure 2-3). Since income as a sensitive topic was recorded in ranges, it is not possible to state whether the overall income was lower than the average at the aimag level. However, 21% of miners are also clearly above the national average with monthly incomes above MNT 1,500,000. Comparing the study areas, income levels in Tunkhel are the highest and the lowest in Bayangol and Yusunbulag. The income of men miners is slightly higher than the income of women miners (see Section 6.2).



	Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	Women	Men	Total
	Region						Total	
Less than 1,000.000 MNT	77%	56%	49%	73%	68%	64%	62%	63%
1,000,001-1,500,000 MNT	10%	21%	13%	16%	19%	16%	17%	17%
1,500,001-2,000,000 MNT	10%	9%	18%	6%	5%	13%	8%	10%
2,000,001-2,500,000 MNT	0%	3%	1%	0%	3%	0%	2%	2%
2,500,001-3,000,000 MNT	2%	1%	4%	3%	3%	1%	3%	2%
More than 3,000,001 MNT	2%	10%	14%	2%	3%	6%	7%	7%

[19] The exchange rate of Mongol Bank as of 31 December 2019 ($1 = ₮2,734.33)

Figure 2-3. Average monthly income from different sources of respondents by study area, gender and total (n=371)

Income from Artisanal Mining

Three quarters of the respondents (77%) listed artisanal gold mining as their main source of income and 33% as their only income source (see section on employment above). Table 2.4-5 shows that 80% of respondents earned less than the national average from artisanal mining, whereas 13% earned more than MNT 1,500,000. However, the average salary in Gobi-Altai and Khovd aimag is below the national average (above MNT 750,000); 29% of respondents in Yusunbulag and 42% in Altai had an artisanal mining below regional average income.

It should be noted that monthly income from artisanal mining activities vary depending on seasonal operation, gold price, ore quality, gold recovery and other possible factors, as explained by two leaders.

> *"When we have regular work, we make from 1.500.000-2.000.000 MNT per month..."*
>
> **KII, male leader of partnership in Khovd aimag**

> *Depends on the amount of ore extracted. Sometimes it's less than a gram of gold, sometimes it's 5-6 grams. The maximum of 10 to 20 grams of gold is a rare treat, but it happens. Depends on how much is still there, in the land. We do not go there in wintertime. People of my age are already grandparents and look after the young ones. We come here only when there is some extra time and only for 1-2 months. Our family has no other income but digging for gold. This is how we make ends meet. I go out for gold when my children's time permits. So, it really varies. When I go digging, we have some income. When I don't, I look after my grandchildren.*
>
> **KII, male leader of partnership in Gobi-Altai aimag**

Table 2.4-5. Average monthly income from artisanal gold mining of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Up to 500,000 MNT (USD 190)	42%	40%	34%	29%	42%	41%	37%	38%
500,001-1,000,000 MNT	42%	46%	37%	52%	32%	39%	43%	42%
1,000,001-1,500,000 MNT	8%	8%	7%	8%	9%	10%	7%	8%
1,500,001-2,000,000 MNT	4%	3%	13%	5%	5%	5%	6%	6%
2,000,001-2,500,000 MNT	2%	1%	4%	2%	3%	1%	3%	2%
2,500,001-3,000,000 MNT	2%	0%	6%	2%	0%	0%	2%	2%
over 3,000,001	0%	1%	0%	3%	7%	4%	1%	2%
No answer	0%	2%	0%	0%	1%	0%	1%	1%

Comparing the study areas, income levels from artisanal mining were the highest in Tunkhel with 23% with an income above MNT 1,500,000, and the lowest in Mandal and Bayangol with 86% and 84% of respondents earning less than MNT 1,000,000. The number of respondents with an income over MNT 3,000,000 in Altai, which identified as miners (n=3), shaft owners (n=1) and support workers (n=1) is surprising and might be overreported. For a detailed gender analysis of income, see Section 6.2.

While many mining organizations indicated that they distribute income equally, income can also depend on the position and tasks in the sector. Table 2.4-6 shows that income below MNT 1,000,000 was the highest among support workers (85%), compared to miners (77%) and shaft owners (69%). Overall, there are no large income gaps between those groups.

Table 2.4-6. Average monthly income from artisanal gold mining by position and formal status in ASGM

	Position				Organizational status	
	Miner (n=117)	Shaft owner (n=36)	Support worker (n=202)	Other (n=16)	Organized (n=282)	Unorganized (n=89)
Up to 500,000 MNT	38%	25%	41%	25%	34%	48%
500,001-1,000,000 MNT	39%	44%	44%	25%	44%	36%
1,000,001-1,500,000 MNT	8%	14%	7%	13%	10%	3%
1,500,001-2,000,000 MNT	6%	6%	5%	13%	5%	8%
2,000,001-2,500,000 MNT	3%	6%	0%	13%	2%	2%
2,500,001-3,000,000 MNT	2%	3%	1%	6%	2%	1%
over 3,000,001	3%	3%	1%	0%	2%	1%
No answer	2%	0%	0%	6%	1%	0%

When analyzing income according to organizational status, miners of formal registered partnerships and ASM NGOs seem to earn slightly more than informal groups and significantly more than illegal miners (Table 2.4-7).

Table 2.4-7. Average income according to organizational affiliation

	Registered partnership	Unregistered partnership	ASM NGO	Informal miners	Illegal miners
Average monthly income	MNT 1,005,385	MNT 891,176	MNT 1,083,000	MNT 929,412	MNT 894,444

Overall, only 37% of the respondents stated that artisanal mining provides enough income for themselves and their families, more so among men (38%) than women (33%). This statement was more often supported by organized miners (formal and informal organizations) (37% to 41%) than illegal miners (31%). Almost one third of all respondents (30%) said that it would only sometimes provide sufficient income, whereas another third (30%) cannot generate sufficient income through artisanal mining.

Overall, the data shows that artisanal mining provides the main source of income for half of the respondents surveyed. However, considering that the amount of income is often less than the national or even regional average and the seasonality of the work, artisanal miners also seek alternative income sources to support their livelihood. Miners organized in registered partnerships and ASM NGOs tend to earn more, especially compared to illegal miners.

2.5 Access to Social Services

Social and health insurance are important social services for miners due to the increased risk of occupational accidents that can also lead to occupational invalidity. However, informal mining status and lack of access to health care can impede access to or willingness to pay for insurance coverage.

Social Insurance

According to the Law on Social Insurance of Mongolia (1994), artisanal miners can be covered by the voluntary social insurance scheme. It covers pension insurance, benefit insurance and industrial accident and occupational disease insurance. Benefit insurance covers pregnancy and delivery, sick leave and funeral costs. The costs for the voluntary social insurance scheme amount to 13.5% of the monthly reported income, or a minimum of 56,700MNT each month, based on the minimum wage fixed by the Government.

According to the survey, the majority of the respondents (60%) do not pay social insurance on a continuous basis. Figure 2-4 shows variations among study areas, with the highest percentage of social insurance coverage in Tunkhel (52%) and the lowest in Bayangol (25%) where the number of unorganized miners is high (38%).

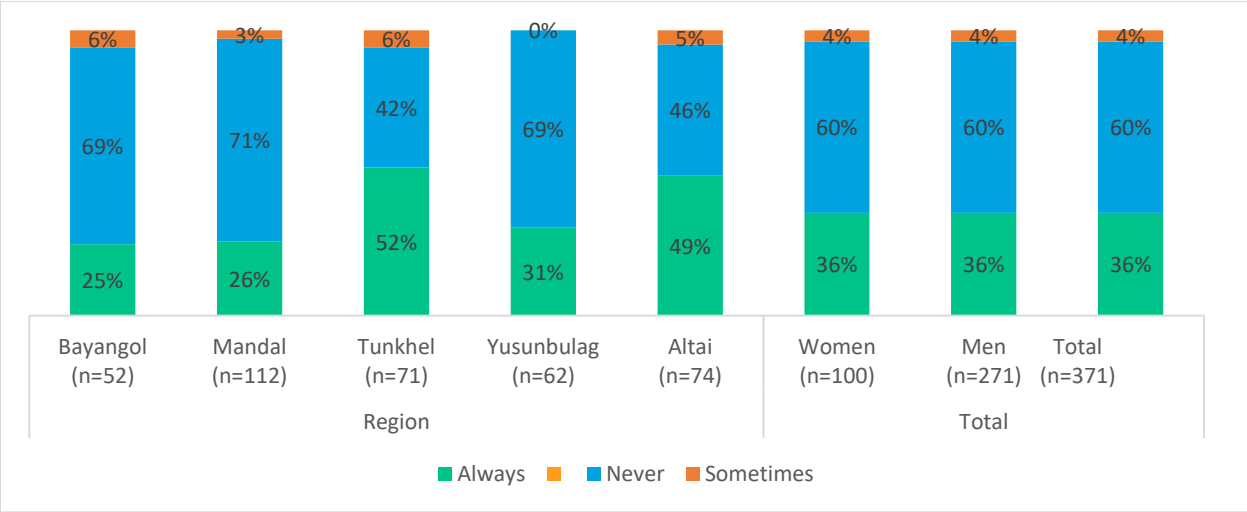


Figure 2-4. Social insurance coverage of respondents by study area, gender and in total

Considering the legal status of a mining organization, social insurance coverage was higher among formal miners (39%) than informal miners (27%). This was confirmed by an officer in Khovd-Aimag:

> *At present, illegal ninjas have not only been digging into intact land, leaving it without rehabilitation, but also jeopardizing their health and lives by avoiding payment for health and insurance premiums and taxes. Therefore, there is a need to switch to responsible artisanal mining.*
>
> **KII, female officer, Khovd aimag**

While this indicates that formal status is an influencing factor, it still does not explain the overall low level of social insurance among women and men miners. A local inspector in Khovd aimag, explained that miners would pay social insurance only for one year during the partnership registration and then discontinue it due to irregular mining income:

> *As far as we know, there are 4 to 5 partnerships in the soum. In 2018, all the miners of these partnerships paid social and health insurance as they were required to submit the documents of their insurance coverage along with the partnership registration documents to the Registration Authority. They paid the insurance payment for a year, however, only a few of them now continue to pay because of unstable operations or a suspension of mining activities. So, the miners individually pay the insurance as they do not work as a partnership at the mining site. … It is important to formalize the artisanal miners and oblige them to pay health and social insurance when we draw up a contract with them and provide information on the benefits of insurance and tax payments.*
>
> **KII, male officer, Khovd aimag**

A partnership leader in Altai explained that within his organization, social insurance fees are paid into a separate account under a special code for the local ASGM miners. This enables miners to get pensions and subsidies for working in harsh conditions. Social insurance fees can be paid according to the lowest scale, as these fees correspond to the minimum wage threshold for payments. In general, unstable and irregular mining operations, combined with lack of income could be major factors affecting low coverage of social insurance among miners. Another local officer explained that many miners would start paying social insurance as they get closer to retirement:

Since artisanal mining is a risky activity, the miners should be covered by compulsory health and social insurance once they are formalized. Only those who are close to the pension age, pay social insurance payments permanently to get a retirement benefit.

KII, male officer, Selenge aimag

Local representatives interviewed for the survey noted that promotional campaigns for social insurance and health coverage targeted at artisanal miners have had certain positive outcomes. An ASGM partnership member raised the point that the seasonality of mining activities should be considered in the fee structure.

Health Insurance

Mongolian citizens can access a package of "essential" healthcare services at the primary level free of charge; complimentary health services are covered by the social health insurance system, which is mandatory. However, the health insurance does not cover all services and out-of-pocket spending on healthcare is high in Mongolia (Jigjidsuren et al, 2019).

Among the survey respondents, health insurance coverage was higher by 27% compared to social insurance. In total, 63% of participants indicated that they pay for health insurance on a regular basis, though the insurance is mandatory for Mongolian citizens (Figure 2-5). The health coverage according to study area shows similar patterns, with more miners paying for health insurance than social insurance coverage. The highest health cover rates were documented in Yusunbulag (76%) and Tunkhel (72%), with the lowest coverage rates found in Bayangol (58%) and Mandal (55%). While the percentage of women and men miners paying for social insurance was the same (36%), more women indicated that they pay for health insurance in comparison to men (77% versus 58%).

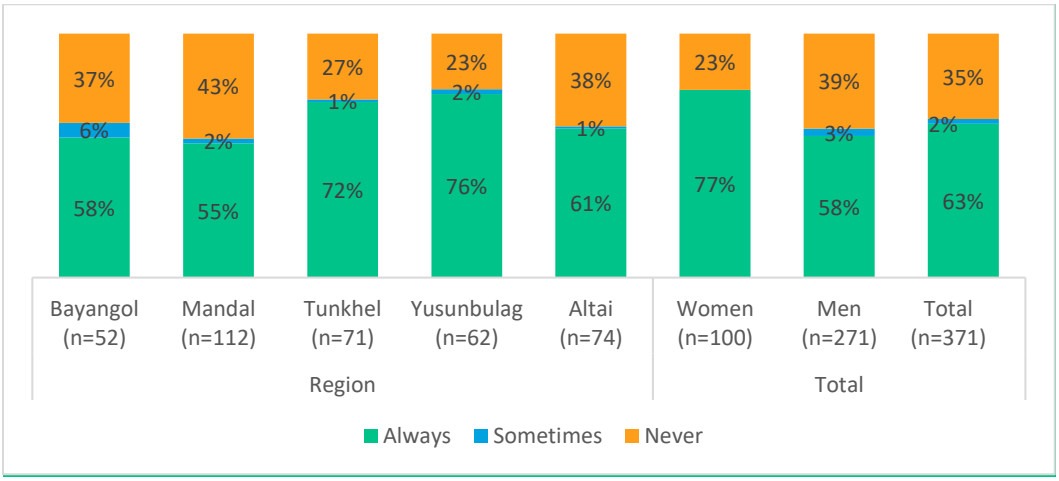


Figure 2-5. Health insurance coverage of respondents by study area, gender, and total

Access to Healthcare Services

From those respondents who pay for health insurance (n=235, 63%), 70% (n=162) stated that they have access to health services. From those not paying for health insurance (35%, n=128), 53% (n=67) said that they have access to health services. This can, for example,

include access to essential healthcare services, which are free of charge without health insurance, or chargeable services in the public or private healthcare sector.

The survey aimed to assess options for miners in terms of access to healthcare services at the mine site. Some miners have to live in temporary dwellings next to the mine site when they work in shifts too far away from their permanent homes to commute daily, which may affect their access to healthcare services. It cannot be ruled out that respondents answered this question with their permanent homes in mind, and the access they have to services at that location, rather than their temporary dwellings. In total, 37% of all respondents reported that they would have no sufficient access to health services while working in artisanal mining. When asked about the reason, 59% reported that they would require no health services, though some of those respondents also indicated that they heard that it is challenging to access health services. Others outlined different challenges, mainly institutional challenges (e.g., costs of the health care service) and legal challenges (e.g., no health insurance) (Table 2.5-1). Access to healthcare is the highest in Tunkhel (80%), where most of the miners can commute to mine sites in the area, and lowest in Altai (50%), where more than half of the respondents worked as illegal miners.

Table 2.5-1. Access to health care of respondents by study area, gender and total

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Access to health care	**60%**	**68%**	**80%**	**52%**	**50%**	**65%**	**62%**	**63%**
No access to health care	**40%**	**32%**	**20%**	**48%**	**50%**	**45%**	**38%**	**37%**
Reasons for no access to health care								
No need to access health care	**25%**	**16%**	**11%**	**29%**	**34%**	**17%**	**24%**	**22%**
Legal challenges	**2%**	**5%**	**4%**	**2%**	**3%**	**2%**	**4%**	**4%**
No health insurance	0%	4%	4%	2%	3%	2%	3%	3%
No residential permission for the aimag	2%	1%	0	0	1%	0	1%	1%
Institutional challenges	**6%**	**5%**	**3%**	**2%**	**10%**	**4%**	**5%**	**5%**
Poor health services	2%	0	0	0	3%	1%	1%	1%
Bureaucratic, long queues	0	4%	0	2%	0	1%	1%	1%
Expensive	4%	1%	3%	0	7%	2%	3%	3%
Individual challenges	**4%**	**3%**	**0%**	**12%**	**1%**	**8%**	**1%**	**5%**
No time to go	4%	2%	0	8%	0	6%	1%	2%
Area too remote	0	0	0	2%	1%	1%	0	1%
Lack of information	0	1%	0	2%	0	1%	0	1%
Others	4	3	1	3	0	2	2	2
Don't know	0	2	0	2	1	2	1	1

The survey did not assess health seeking behaviour. Further research is needed into whether miners would only visit health care facilities for acute problems or would also go for routine check-ups in order to identify early stage general and occupational health problems. A leader in Khovd aimag explained that miners within his partnership would not go for regular check-ups but that medical practitioners would sometimes come to their work site and offer free health checks.

> *As no serious injury or accidents were registered in our soum, our partnership members have never received any emergency medical services. We do not go for monthly or annual regular health check-ups. We undergo health check-ups only if doctors from Ulaanbaatar arrive with offers of free diagnosis and check-up. We aren't the type of people to see a doctor, unless very sick.*
>
> **KII, male leader of partnership in Khovd aimag**

The survey data shows that in each study area, there is a segment of miners without adequate access to health care. While availability of services was not identified by respondents as major barriers, accessibility seems to be influenced by legal and institutional barriers.

2.6 COVID-19 Pandemic Impact

The outbreak of COVID-19 has had a significant impact on Mongolia. From the early stages of the pandemic, Mongolia had been pro-active in aggressively taking steps to minimize the health impact. On January 6, 2020 the Ministry of Health assembled a COVID-19 task force, which quickly led to school closures and border closures with China by January 31. This was followed by additional international travel bans. Internal travel restrictions were

set in place preventing all intercity travel, all public assemblies and gatherings were also banned. These internal restrictions were systematically repealed from May 1 till September 15, but the border closure and international travel ban was still in place as of December 31, 2020.

The survey assessed the impacts of the pandemic on the miners at the study areas to gain insights into the vulnerability of the sector caused by international market disruptions. Since the prevalence of COVID-19 was very low during the time the survey was conducted, questions focused on indirect impacts caused by market disruptions and disease knowledge to inform the planetGOLD Mongolia project on possible training needs.

COVID-19 protocols being observed at the project site in Tunkhel village (photo taken by planetGOLD Mongolia)

A total of 248 respondents (67%) stated that the coronavirus pandemic had affected their ASGM operations. The study areas that were least affected by COVID-19 according to the respondents were Altai (49%) and Tunkhel (63%), while in the other three sites around three quarters of all respondents reported COVID-19 related disruptions. The disruptions were mainly caused by the reduction of workers that could work due to quarantine restrictions (61%), loss of work or less work due to COVID-19 (32%); a decreased gold price was only reported in Bayangol and Altai (8% each), indicating regional differences in supply chain disruptions. According to gender, men (72%) reported more disruptions than women (65%).

Table 2.6-1. Effects of the coronavirus pandemic on ASGM operations by study area, gender and total

	Region					Total		
	Bayangol (n=39)	Mandal (n=83)	Tunkhel (n=45)	Yusunbulag (n=45)	Altai (n=36)	Women (n=72)	Men (n=176)	Total (n=248)
Reported impacts	**75%**	**74%**	**63%**	**73%**	**49%**	**65%**	**72%**	**67%**
Number of workers decreased due to quarantine	46%	61%	69%	73%	50%	64%	53%	61%
Income/job loss due to work loss	33%	34%	27%	27%	39%	29%	39%	32%
Decreased gold price	8%	0%	0%	0%	8%	2%	4%	2%
Processing plants stopped working	8%	1%	0%	0%	0%	1%	4%	2%
Others	5%	4%	4%	0%	3%	5%	0%	3%

Asked about COVID-19 precautions implemented at the mining site, a total of 230 miners (62%) reported having introduced precautions, with regional variations (Figure 2-6). Compliance was the highest in Tunkhel (89%) and the lowest in Altai (15%); women seemed more aware of the COVID-19 precautions that had been introduced.

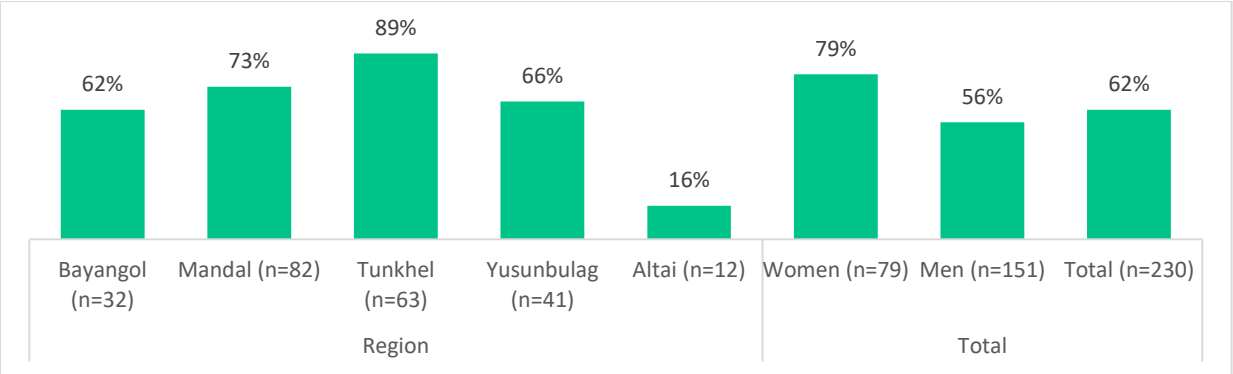


Figure 2-6. COVID-19 preventive measures at work applied by respondents by study area, gender and total

Taking a closer look at the type of precautions, 43% of all survey participants reported wearing masks, 17% frequently washed their hands and 12% had disinfected the work sites.

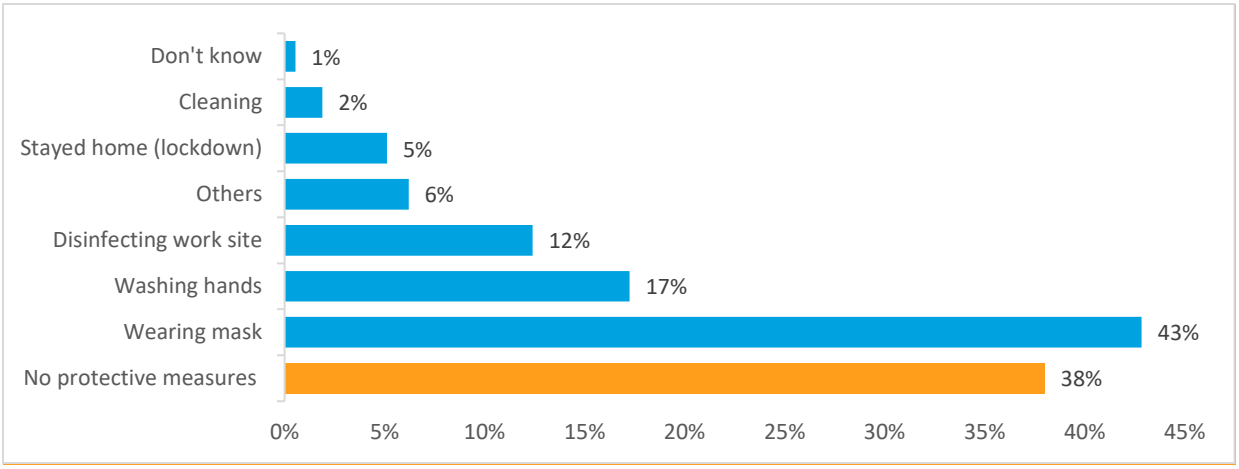


Figure 2-7. Protective measures reported by respondents (n=371; multiple answers recorded, total=461)

Asked about the impact of the pandemic on their livelihoods in general, 79% of respondents answered that they have been impacted. The respondents mainly reported the economic impacts of COVID-19, leading to decreased income (30%), an economic crisis and inflation (21%) and unemployment (13%). General impacts caused by quarantine were mentioned by 14% of respondents, while school closure was only addressed by 4%.

Table 2.6-2. Coronavirus pandemic effect on the respondents' livelihoods (multiple answers recorded; total=404)

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
No impact	**29%**	**20%**	**25%**	**8%**	**23%**	**22%**	**20%**	**21%**
Impacted by COVID-19	**71%**	**80%**	**75%**	**82%**	**77%**	**78%**	**80%**	**79%**
Reported COVID impacts								

Economic crisis (inflation, increase in prices)	15%	24%	21%	29%	15%	25%	20%	21%
Unemployment	25%	17%	14%	8%	4%	10%	15%	13%
Decreased income	23%	34%	27%	29%	32%	30%	30%	30%
Childs school was closed	4%	4%	1%	5%	4%	1%	4%	4%
Quarantine	8%	12%	17%	19%	15%	8%	16%	14%
Other	6%	5%	4%	6%	9%	9%	5%	6%

The majority of the respondents (91%) stated that they had received sufficient information about the coronavirus pandemic to be able to protect themselves. The respondents received information mainly via television (information broadcasted by Ministry of Health), phone messages and Facebook. However, the survey did not assess the accuracy of information provided via Facebook, the knowledge level of respondents or whether respondents updated their knowledge on a regular basis. This is important to note, considering that the knowledge on COVID-19 is evolving constantly. For example, in terms of air-borne transmission risks or the vulnerability of children. Hence, the findings confirm that miners have access to information without taking into account the accuracy of information and knowledge uptake.

2.7 Conclusions

Comparing the study areas, Tunkhel had the highest number of formalized respondents, miners with the most sector experience over 10 years, most income above MNT 1,000,000, and consequently also the highest number of respondents who could live from artisanal mining only. Yusunbulag and Mandal scored second and third in most of these categories, whereas Bayangol scored fourth in all categories and Altai fifth, except for income. While these numbers are not representative for the whole sector in these five study areas, they imply that Tunkhel is the most established area, whereas Altai is the least established.

Overall, the data shows that artisanal mining provides the main source of income for half of the respondents surveyed. However, considering that the amount of income is often less than the national or even regional average and the seasonality of the work, miners also seek supplementary income sources to support their livelihood. Only one third of respondents can live from artisanal mining only. Miners organized in registered partnerships and ASM NGOs tend to earn more, especially compared to illegal miners. Within organizations, income tends to be split equally among all members.

In order to engage in artisanal mining, the majority of the interviewed miners were organized (76%), mainly within registered partnerships (53%) or ASM NGOs (14%), complying with respective laws and regulations. A total of 5% of miners belonged to an organization but currently work without a contract and were classified as informal miners. A total of 19% of the respondents did not belong to any formal organization and were classified as illegal miners.

Insurance coverage among miners was insufficient. Only one third (36%) of respondents paid social insurance on a regular basis and two thirds paid (63%) health insurance. While

formalized miners had higher coverage, irregular and unstable operations of artisanal mining, lack of knowledge and information on benefits of social and health insurance schemes could be the major factors affecting low coverage of social insurance among miners. Two thirds (64%) of miners indicated they have access to health care while working at artisanal mining sites, while others reported institutional and legal barriers to accessing health care. However, the survey also indicated that behavioural and knowledge barriers are preventing miners from going for routine health check-ups. These check-ups are important, as they identify chronic occupational health problems (e.g., silicosis) or non-communicable diseases in general such as kidney disease, which can be caused by occupational and non-occupational risk factors.

The survey also showed that the coronavirus pandemic has affected the sector: Around two thirds of the respondents (67%) reported disruptions, mainly income loss due to job loss, inability to go to work, or reduced production capacity due to the limited number of workers on the site.

3. ASGM Legislation and Formalization in the Study Areas

3.1 History of ASGM and Government Approaches

The ASM sector in Mongolia emerged in response to economic transition and climatic disasters in the late 1990s and early 2000s that resulted in widespread unemployment and loss of livelihoods (Chapter 1). The Government of Mongolia considered ASM as a temporary social phenomenon; it was assumed the sector would disappear as a result of the country's economic growth and rapid development of formal mining. For this reason, for the initial decade, the Government did not take any serious steps to create a legal environment that recognizes the presence and supports the development and conduct of artisanal mining. Instead, the Government focused largely on stopping or banning the practice characterizing the practice as criminal and imposing penal provisions. However, the increasing number of artisanal miners resulted in an increase of accidents and fatalities due, among others, to poor or non-existent health and safety measures as well as environmental degradation from a lack of environmental law compliance.

Therefore, the Government had to take actions to regulate the sector (Info box 6). Number of attempts were made to regulate the sector starting from the approval of the "Sub-program to develop ASM until 2015" the Temporary Regulation for coordinating mining activities of ASM miners in 2008.

On July 1, 2010, ASM was officially recognized by amending the Minerals Law and including a clause to create a regulation on ASM by the Government. The Minerals Law provided for the right to mine without a license, taking into account the specifics and conditions of artisanal miners, and stipulates they may operate only in areas that are not economically viable for industrial use; and are affected by mining activities (Parliament of Mongolia, 2006).

Following the law, the Government approved the Regulation for Extraction of Minerals by Artisanal and Small-Scale Mining by its Resolution #308 of 2010 (the Regulation 308). Regulation 308 formally set out the rights and responsibilities of the government organizations, local governments, and self-governing bodies,

Info Box 6: ASM Legal Timeline

2008: Approval of "Sub-program to develop ASM until 2015"
2008: Approval of temporary regulation for ASM activities
2008: Issuance of the Order 135 of the Minister of Environment on "Prohibiting Mercury in Mineral Processing"
2010: Amendments to the Minerals Law and the Land Law
2010: Approval of ASM regulation 308
2014: Amendment to the Minerals law on extraction of minerals by artisanal mining
2014: Inclusion of ASM in the "State Policy on the Minerals Sector"
2015: Ratification of the Minamata Convention on Mercury by the Parliament of Mongolia
2017: Approval of the revised ASM Regulation 151
2017: Approval of the ASM rehabilitation methodology
2017: Approval of the ASM Safety Rule
2019: Approval of the National Action Plan for reducing mercury in ASGM
2019: Approval of the Government Resolution 355 on Taking Measures on Extraction of Minerals by ASM
2019: Approval of the Regulation for

as well as the miners. It allowed the establishment of ASM partnerships and cooperatives and permitted them to establish mining contracts with local governments.

In this regard, the 2010 amendments to the Minerals Law, the Land Law and subsequent approval of the Regulation 308, have officially recognized ASM as a formal mining operation for the first time and paved the way for Mongolian artisanal miners to be organized and formalized.

3.2 Current Legal Environment and Policy

Today, the ASM sector in Mongolia is regulated by the following legislative acts (in chronological order):

1. Law on State Treasury (1994)
2. Law on Partnerships (1995)
3. Law on Cooperatives (1998)
4. Land Law (2002)
5. Minerals Law (2006)
6. Law on Toxic and Hazardous Chemicals (2006)
7. State Policy on the Mineral Resources Sector (2014)
8. Operating Procedures of the Treasury Fund (2014)
9. Criminal Code Law (2015)
10. Infringement Code (2017)
11. Gold-2 Program (2017)
12. Regulation on Extraction of Minerals by Artisanal and Small-scale Mining (2017)
13. ASM Rehabilitation Methodology (2017)
14. ASM Safety Rule (2017)
15. Government Resolution 355 on taking measures on Extraction of Minerals by Artisanal and Small-scale Mining (2019)
16. Regulation for Operating Processing plants and Operation requirements (2019)
17. National Program to Reduce Mercury Pollution from Artisanal Gold Mining (2019)
18. Regulation for Licensing, Permitting and Registration of Dealers in Precious Metals and Stones and Products Made from Them (2020)

The following discussion focuses on specific laws that has a broad impact on mining and mineral processing in Mongolia.

Regulation for Extraction of Minerals by Artisanal and Small-Scale Mining

The main administrative legal act regulating the activities of artisanal miners is the Regulation on Extraction of Minerals by Artisanal and Small-Scale Mining (ASM Regulation 151) approved by the Government Resolution #151 on May 24, 2017. The objective of the ASM Regulation 151 is to establish procedures for proper extraction of minerals in economically inefficient deposits for industrial mining methods and in waste fields derived from mining and technology, protecting the environment, and reducing poverty through increasing workplaces in local areas (ASM Regulation, 2017).

The Regulation is applicable for all types of minerals extraction by artisanal mining except for water, radioactive element bearing ores, petroleum, natural gas, and commonly spread minerals (i.e., development minerals).

Government Resolution #355 on Taking Measures on Extraction of Minerals by ASM

Alluvial mine site in Khovd province (photo taken by planetGOLD Mongolia)

For the past four years, there have been increased reports of environmental degradation especially in alluvial gold mines. It has been reported that medium-scale companies are taking advantage of the ASM Regulation 151's increased engine capacity and working under the guise of ASM but not doing environmental rehabilitation (Section 4.2). Therefore, the Government issued the Resolution #355 (Resolution 355) on September 18, 2019, to protect the environment and eliminate the negative mining impacts, promote rehabilitation, to enforce legislation, and stop illegal mining activities.

While ASM Regulation 151 is still in force, Resolution 355 prohibited the MRPAM to issue new ASM Land Conclusions, and local governments to conclude new ASM contracts until the revision of the ASM Regulation. Resolution 355 stated that a draft amendment to the relevant ASM legislation would be developed and discussed at the government meeting by the fourth quarter of 2019.

The taskforce led by the MMHI has been created to amend the ASM Regulation 151. The planetGOLD Mongolia project has been invited to the taskforce and is currently providing comments to the regulation.

National Action Plan for Reducing Mercury Pollution Caused by Artisanal and Small-scale Gold Mining (NAP)

Mongolia ratified the Minamata Convention on Mercury in 2015 and has obtained the technical assistance and financial support from UN Environment to develop the National Action Plan (NAP) for Reducing Mercury Pollution Caused by Artisanal and Small-scale Gold Mining. The NAP is a comprehensive and multi-dimensional programme requiring the Government's commitment, inter-ministerial coordination, and collaboration of diverse stakeholders and financing to fulfill Mongolia's obligations under the Minamata Convention as well as achieving environmentally sound and safe ASGM operations.

Mongolia's NAP was approved on August 14, 2019 through Government Resolution 317. The Workplan for the implementation of the NAP was approved under joint orders A/232 and A/66 of April 07, 2020 by the Minister of Environment and Tourism and the Minister of Mining and Heavy Industry. The objectives of the NAP are to reduce the environmental impacts of ASGM and mercury emissions by at least 50% compared to present time

through fully terminating the outdated and environmentally harmful technologies used in ASGM and to eliminate the illegal mercury trade and its hidden use.

The second objective of the NAP is to rationalize the optimal structure and functions of government agencies managing ASGM activities, enhance the inter-sectoral coordination, stakeholders' engagement, and cooperation to improve capacity and ensure implementation of the legislation. Under this objective, the Government aims to improve the ASM laws and regulations, to strengthen the liability mechanism, and to optimize the inter-sectoral coordination to implement the policy and its activities and to streamline the institutional structure.

The non-permanent intersectoral council that is responsible for the coordination of the intersectoral activities to be implemented nationwide and monitoring of the NAP implementation was established on 19 November 2019. The council consists of relevant stakeholders including three ministries and its affiliated agencies, Bank of Mongolia, NSO, GASI, and CSO representative and the planetGOLD Mongolia project.

Furthermore, the Government aims to conduct an assessment reviewing and renewing existing policies and legislations on ASGM. The legal assessment will cover issues (land tenure, mining rights, decent working conditions, gold trading regulations, and access to domestic and international markets) to reveal gaps and barriers hindering formalization in the sector and to reflect in development of more comprehensive policies and regulations.

One of the key challenges for artisanal and small-scale gold miners is related to land access and licensing. Therefore, MMHI has been tasked to ensure that gold reserves to be used for ASGM purpose are properly identified and registered and enable timely access to the data (Government of Mongolia, 2020).

3.3 Relevant Government Bodies

The Minerals Law and ASM Regulation 151 define the roles and responsibilities of government organizations at different levels.

State Great Khural (Parliament) is the main legislative body of the country. In addition to approving and amending laws, it also has oversight power. Therefore, in terms of ASM, the Parliament oversees the Government's actions undertaken in relation to the implementation of legislations on ASM and can limit or ban extraction of minerals from certain territories, either in response to a proposal from the Cabinet or on their own initiative.

As the executive branch, **the Government** is responsible for approving regulations on ASM (Parliament of Mongolia, 2006) and ensuring implementation and compliance with laws and regulations through its ministries and agencies.

As mentioned in Chapter 1, the **Ministry of Mining and Heavy Industry** (MMHI) is the main government organization in charge of the mining industry in Mongolia. Its main responsibilities regarding ASM are:

1. Ensure the implementation of artisanal mining relevant legislations in line with the State Policy towards Minerals Sector and provide general supervision;
2. Ensure transparency in artisanal mining operations, processing and sales of minerals extracted by artisanal mining;
3. Establish a non-staff inter-sector council responsible to cohere functions and coordination of State administrative organizations on artisanal mining, and approve the membership consistence and functional regulation;
4. Approve the frugal rehabilitation methodology jointly with the State administrative central organization in charge of environmental issues and control over its implementation;
5. Approve requirements on processing plants and operating procedures; and
6. Approve regulations for commissioning processing plants.

Its Department of Mining Policy is responsible for mining sector policies and implementations including the industrial and the ASM gold sector.

The **Ministry of Environment and Tourism (MET)** is a government ministry in charge of setting policies and regulating the environmental management and protection of the country. The Ministry has branch departments of Environment and Tourism in each province and the capital city. The ministry acts as focal point for many environmental conventions that the country is party to, including the Minamata Convention. For mining and minerals processing activities, the Ministry reviews and approves their environmental impact assessments, environmental management plans and environmental protection reports.

The **Mineral Resources and Petroleum Authority of Mongolia (MRPAM)** is an implementing agency under the MMHI. The MRPAM used to have a "Division for Artisanal Mining" in 2007- 2016, but the Division was dissolved due to a government restructuring. Currently, the MRPAM has three officers in charge of ASGM. Though not under the ASGM division, they have clear mandates which are:

- Evaluate the technology of the artisanal miners;
- Issue ASM Land Conclusion;
- Determine the size and boundaries of ASM land; and
- Register the location of the ASM processing plants.

General Agency for Specialized Inspection (GASI) is a government agency in charge of conducting inspections on the implementation status of almost all major legislations in all sectors. Its Environment, Mining and Geology inspection department is responsible for conducting inspections of both LSM and ASM activities for their adherence to all related laws including Minerals law, ASM regulations, environmental and chemical laws. The agency has branches and inspectors in all provinces and soums. The agency also approves the Blasting Materials Inspection Document which is a key document for conducting blasting activities.

Info Box 7: Administrative Divisions of Mongolia

Mongolia is divided into 21 aimags or provinces and one municipality. An aimag is the first-level administrative subdivision. Each aimag is subdivided into several soums. A soum is the second level administrative division below the aimags. Each soum is again

divided into baghs. The capital Ulaanbaatar is administrated as an independent municipality. It is divided into nine districts and each district is subdivided into khoroos. As of 2019, there are 330 soums, 1,639 baghs, nine districts and 169 khoroos in Mongolia (NSO, 2019).

The capital city, aimags, and soums are governed by Citizens' Representatives Khural (CRK) elected every four years. The Governors of the Capital city, aimags, soums and bags are appointed with four-year terms upon the CRKs' nominations.

As specified in Regulation 151, **aimag, capital city and soum CRKs'** duties include formulating and submitting recommendations and directions to the local governor on actions regarding artisanal mining. With the exception of the soum CRKs, aimag and capital city CRKs also discuss and decide, based on requests from aimag and capital city governors, for designating land available for the purpose of ASM.

According to the Regulation, **aimag and capital city governors** have more broad rights and responsibilities in their respective territories. These include organizing actions to enforce ASM legislations, developing plans for regionalized implementation of ASM, transferring soum and district governors' requests on Land Conclusions to the MRPAM, providing supervision and oversight to soum and district governors in organizing ASM operations, creating an ASM database and submitting data to relevant organizations; collecting ASM data from soums and districts and submitting it to relevant bodies and organizations, organizing activities to control rehabilitation activities in artisanal mining areas, taking measures on preventing ASM accidents, and providing rescue and aid services.

The Regulation states that the main public official representing the government (to communicate directly with artisanal miners) be the **soum and/or district governors**. Their duties and rights include:

- Registering artisanal miners;
- Providing technical and professional assistance;
- Concluding mining contracts with miners;
- Terminating contracts in case of violation;
- Overseeing operations of artisanal miners;
- Ensuring ASM environmental rehabilitation and receiving rehabilitated fields;
- Providing social welfare and insurance services for artisanal miners; and
- Controlling and inspecting the use and storage of toxic and hazardous chemicals.

In addition to these government bodies, **Artisanal and Small-Scale Mining National Federation (ASM NF)** is an umbrella organization established in 2013 to respond to the emerging need of artisanal miners for the development of sustainable artisanal mining by improving the sector's socio-economic impacts, promoting positive public attitudes towards ASM, and promoting safe working conditions. It runs activities related to environmental rehabilitation, formalization, capacity building, advocacy, policy discussion, resource mobilization and promotion of business of artisanal miners.

3.4 Formalization of ASM

Formalization "is a process that seeks to integrate ASGM into the formal economy," and can only be achieved if "programmes and public policy deal with the different dimensions of ASGM activities simultaneously and in an integrated way." (UNEP, 2012: 2). A critical first step to formalization is securing ASGM legal permits to mine and process ore. The discussion that follows looks at the elements in the first step: organizational types and key permits.

Organizational Types

By recognizing ASM, the Minerals Law has defined what formal ASM is under the Clause 4.1.23. "artisanal and small-scale mining is the activity of individuals organized in the form of unregistered partnerships as stated in Clause 481.1, cooperatives stated in Clause 36.4, and partnerships stated in the Article 35 of the Civil Code, to extract minerals from economically inefficient deposits with non-industrial reserves and from fields derived from mining and technological wastes" (GoM, 2006: Page 5).

ASM Regulation 151 further elaborates on who can conduct artisanal and small-scale mining:

- Citizen of Mongolia with age of at least 18 years old;
- Registered as a resident of the aimag or capital;
- Member of a partnership, cooperative or unregistered partnership (See Info Box 8); and
- Partnerships and unregistered partnerships must have at least nine members.

Info Box 8: Types of ASM Organizations

Partnership is a legal entity established by 'several persons consolidating their property for the purpose of making a profit and agreeing to organize certain types of production and services in the manner specified in this law (Article 2, Partnership Law).

Cooperative means 'a legal entity that is jointly established by several persons for the purpose of meeting their common economic, social and cultural needs, founded on a voluntary basis, with unified, democratic and joint management and oversight, with operations based on shared assets. For a partnership, agreement on incorporation serves as the basis for its operations while for the cooperative, endorsement of by-laws, serves as the rationale for official registration by government authorities. (Article 3, Law on Cooperatives)

Unregistered partnerships are established in accordance with Article 481 of the Civil Code. By law, this form of partnership that citizens get organized based on their agreement and the form of working group and with no status of a legal entity. Unregistered partnerships are characterized by their specificity (such as members representing the cooperative) and revenues generated from operations are considered as jointly owned assets of members.

Among these ASM organization types, an unregistered partnership is a relatively easy arrangement for artisanal miners for their operations, but there are some drawbacks. For

example, there is no scope for the exercise of rights as legal entities, and further growth and expansion opportunities are limited. For example, Regulation 151 only allows usage of the increased 3,500 cm^3 mechanized equipment for registered partnerships and cooperatives (ASM Regulation 151).

Establishing a partnership is much easier than establishing a cooperative in terms of the processes and formulating documents quickly and easily. Both partnerships and cooperatives provide formal rights as legal entities once they are registered by the state registration agency in their respective territories. As for unregistered partnerships, registration is not mandatory as they do not exercise the rights of legal entities.

Key Permits

Land access: The most important element in attaining legal status as an artisanal and small-scale miner is to have legal access to the ASM land. In addition to being part of the above-mentioned legal entities, if the miners do not have permitted access to the land that they want to mine, they are not regarded as formal miners.

The foremost required permit is the ASM Land Conclusion. Article 2 of Regulation 151 stipulates that a person (usually the ASM organization) wishing to engage in ASM must submit an application to the soum or district governor in accordance with the approved form. The soum/district governor submits a "Land Conclusion" application to the aimag governor who then transfers the requests to the MRPAM. The MRPAM reviews the area and, if there is no overlap with existing mining and exploration licenses and protected areas, issues a confirmation (Land Conclusion) that the area can be used for artisanal mining.

Based on the MRPAM Land Conclusions, the aimag/capital city CRKs review the request and decide whether the land can be designated for special local needs for ASM purpose during the CRK land management meetings. The land management plan meetings usually take place twice a year, and if the land is approved at these meetings, the soum/district governors are notified by the aimag/capital city governors.

Article 4 of Regulation 151 further limits the area of a single ASM land to five hectares and the number of areas selected for ASM within one soum or district shall not be more than 10 for the present year. This effectively means 50 hectares of land can be allocated for ASM purposes and contracts on an annual basis.

Mining contracts: If the requested land have been confirmed by the MRPAM for ASM and designated by the CRKs, a mining contract will be signed between the soum/district governors and the ASM organizations. The ASM Regulation 151 clearly states that the contract duration should extend until the mineral resources are extracted completely. In practice, however, local governments usually limit the contracts for up to a period of one year only. The ASM regulation further allows a tri-partite contract between soum/district governor and LSM company and ASM organization if an LSM allows the miners to work on their mining concessions.

The decisions on ASM land approval and contracting have been slowed down as the Council meets only twice per year. Additionally, if the miner is a resident of the aimag,

s/he can engage in artisanal mining in any soums within the aimag with the land use contract from the provincial government, leading to conflicts with the soum miners.

Environmental management and protection: The regulation requires miners to have approved environmental rehabilitation plans, to create funds and to rehabilitate the mining area according to the ASM Rehabilitation Methodology which was approved by the joint order of the Minister of Environment and Tourism and the Minister of Mining and Heavy Industry in 2017 (MET & MMHI, 2017). The methodology contains guidelines for technical and biological rehabilitations and templates for rehabilitation plan, reporting, monitoring and receiving rehabilitation works.

3.5 Formalization Status in the Study Areas

The local governments in the surveyed soums accept that ASM is a main source of income for the residents. They agreed that if the ASM Regulation is stable and land allocation for artisanal mining is sufficient, the local administration would be able to organize artisanal miners more responsibly in terms of environmental, social and safety issues. If they are formal, it will be easier to organize related trainings and establish environment and safety controls. In the last six to eight months, the economic situation of local citizens has deteriorated due to Resolution 355 according to the Bayangol Governor. The Gobi-Altai aimag governor indicated they are instructed to halt all ASM operations in accordance with Resolution 355, but he believes illegal mining operations are increasing as a side effect, leading to increased impact to the environment and future restoration expenses.

> *There are more than 1,000 artisanal miners in our soum. ASGM is one of the job opportunities in the local area. Therefore, we will support if the miners' group operates in accordance with the regulation, meets the OHS safety requirements and obtains the Land Conclusion. No new contracts have been signed yet, but miners who have already signed contracts are working officially.*
>
> **KII, male officer, Selenge aimag**

ASM Organizations

According to the statistics provided by the ASM National Federation, miners in the five study areas were organized in form of registered and unregistered partnerships for their mining activities (see Section 1.3). There are no artisanal mining groups organized by the cooperative, most likely because establishing a partnership is much easier than establishing a cooperative in terms of the processes and formulating documents required. The partnerships also come together to form their own NGOs and unite their voices. There are four ASM NGOs in the study areas.

Table 3.5-1. Number of partnerships and members by study area

№	Province	Soum	Number of partnerships	Number of members
1	Gobi-Altai	Yusunbulag	22	214
2	Selenge	Bayangol	27	108
3		Mandal	32	189
4		Tunkhel	8	180
5	Khovd	Altai	11	99
TOTAL			**100**	**790**

Access to Mining Land and Agreement with Local Government

As of June 2020, some of the ASM partnerships with current valid land contracts are conducting their mining operations in Mandal, Tunkhel and Altai. But due to the suspension of the implementation of the Resolution 355, no new Land Conclusions have been issued by the MRPAM, no new mining contracts with artisanal mining partnerships and cooperatives have been made, and the official closure of formal processing plants has created uncertainty at the local areas and will potentially increase illegal mining.

In Tunkhel, an ASM organization has signed an ASGM contract with the soum governor in 2019 for their mine site where they had been mining informally for more than 10 years. As a result, artisanal mining has become more organized, and occupational health and safety regulations as well as land rehabilitation have become more responsible on a regular basis. Thus, it has become easier to monitor the ASM operation.

In Bayangol, there is no land permitted for ASM operation for hard rock gold mining. The main ASM area which is called “Nart” artisanal mining site where artisanal miners have been operating for long time, belongs to Boroo gold and Selenge Mineral companies' licensed area. The soum governor informed that they made an initial solution to formalize the land allocation and requested official Land Conclusion from the MRPAM but due to the Resolution 355, it is on hold.

In Gobi-Altai aimag, there is currently one ASM partnership with a Land Conclusion in hard rock artisanal gold mining in its Altai, GA. Two years ago, artisanal miners of Yusunbulag signed an agreement with the Altai GA governor and were mining in the area. However, local mining and environmental specialists indicated that the “Zamiin Am” ASGM site in Altai was shut down in March 2019 due to the difficult geological conditions, it was concluded that blasting permits could not be issued. Furthermore, the site is located in an earthquake zone, posing a great risk for high-altitude mining operations. While the permit for the site is still valid, with difficult extraction conditions, the mining shafts have been closed and most miners have returned to Yusunbulag, the provincial center.

As of October 2020, the MRPAM has issued 292 ASM Land Conclusions covering 1,063.7 hectares in Mongolia (MRPAM, 2020).

Table 3.5-2 illustrates the land allocation for ASGM operations of the study areas and aimags covering size, mining method, number of miners (gender-disaggregated) registered to the partnership, including alluvial and placer mine sites. According to the statistics provided by the MRPAM, a total 90.98 ha of ASM land was allocated to 17 partnerships with 150 members in 2019. Of the partnerships, nine were operating in underground shafts and eight in open pit shafts.

Table 3.5-2. Mine site information per study area (Data: MRPAM, 2019)

№	Aimag	Soum	Mine site name	Size of mining area (ha)	#of miners	Gender	
						Men	Women
1	Gobi-Altai	Altai	Zamiin am	5	12	10	2
2	Gobi-Altai	Altai	Zamiin am	5	12	10	2
3	Selenge	Mandal	Noyot	5	9	7	2
4	Selenge	Mandal	Noyot	5	12	9	3

5	Selenge	Mandal	Noyot	5	9	4	5
6	Selenge	Mandal	Noyot	0.5	11	10	1
7	Selenge	Mandal	Noyot	0.5	14	13	1
8	Selenge	Mandal	Noyot	0.5	10	6	4
9	Selenge	Mandal	Noyot	4.96	6	6	
10	Selenge	Bayangol	Buyan	4.96	9	6	3
11	Selenge	Bayangol	Urt bulag	4.61	10	7	3
12	Selenge	Bayangol	Talbai 1	4.37	9	6	3
13	Selenge	Bayangol	Naran	4.62	10		
14	Selenge	Bayangol	Baga muhar	4.96	9	8	1
15	Khovd	Altai	Maikhan-1	0.23	9	7	2
16	Khovd	Altai	Maikhan-2	0.81	9	7	2
17	Khovd	Altai	Ulaan bogoch	4.96	9	6	3

According to the survey, the mining organizations of 65% of partnership members have a Land Conclusion for gold mining (Figure 3-1). In some cases, local miner groups (unregistered) or partnerships can enter into an agreement with the local authority with or without Land Conclusions. Local authorities make a mutual agreement with the miners' organization and allow them to engage in mining operation. According to the Regulation 151, miners' organizations or groups may enter into tri-partite agreements with large companies and local governments. A total of 59% of surveyed artisanal gold miners said that their organization has a mining contract with local authorities, with a clear gradient between ASM NGOs (82%) and illegal miners (13%) (Figure 3-2).

Looking at the study sites, 28% of miners in Bayangol answered that they have a Land Conclusion from the MRPAM and 33% of all miners have an ASM land contract with the local government, but according to the local government and the MRPAM there is no official land allocated for hard rock gold mining in the soum. Those miners who answered yes to the question might work in placer mining or probably answered in fear of legal action. In Mandal, 72% of partnership members answered that they have a Land Conclusion and 63% of all respondents have a land contract. However, at the time of the survey the mining partnerships were unable to extend their ASM contract with the local government. Tunkhel has the highest number of miners reporting that they have a legal contract: 76% of all partnership members answered that they have a Land Conclusion and 88% of all respondents have a land contract. In Yusunbulag, 66% of all partnership members answered that they have Land Conclusions and 79% of all respondents have a land contract. But according to the local government, ASM operation is halted in the area of Altai, GA where hard rock gold mining Land Conclusion is issued. In Altai, GA, 53% of partnership members reported to have a Land Conclusion and 42% have a land contract.

Overall, it can be assumed that miners overreported existing legal contracts because of fear of prosecution.

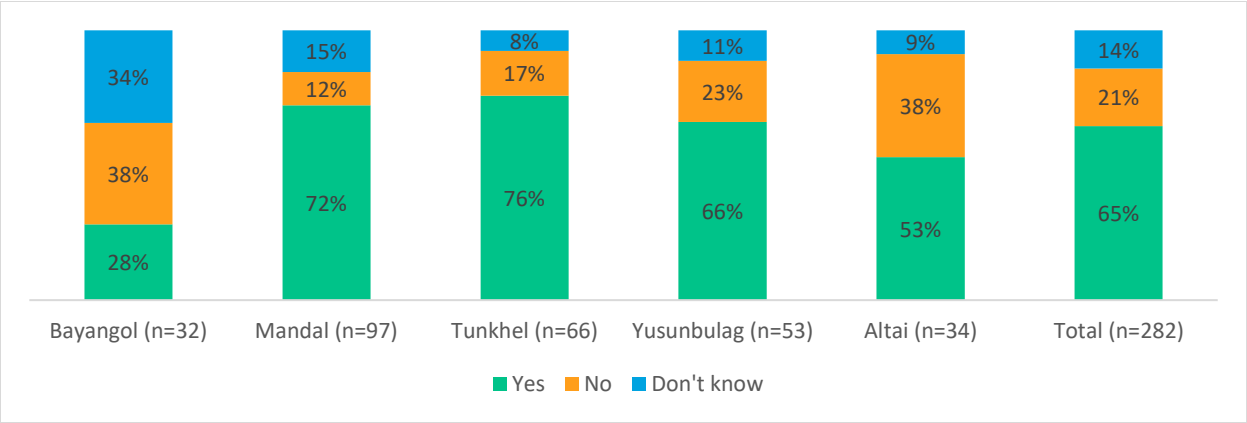


Figure 3-1. Members of partnerships whose organizations have a Land Conclusion, by study area and total

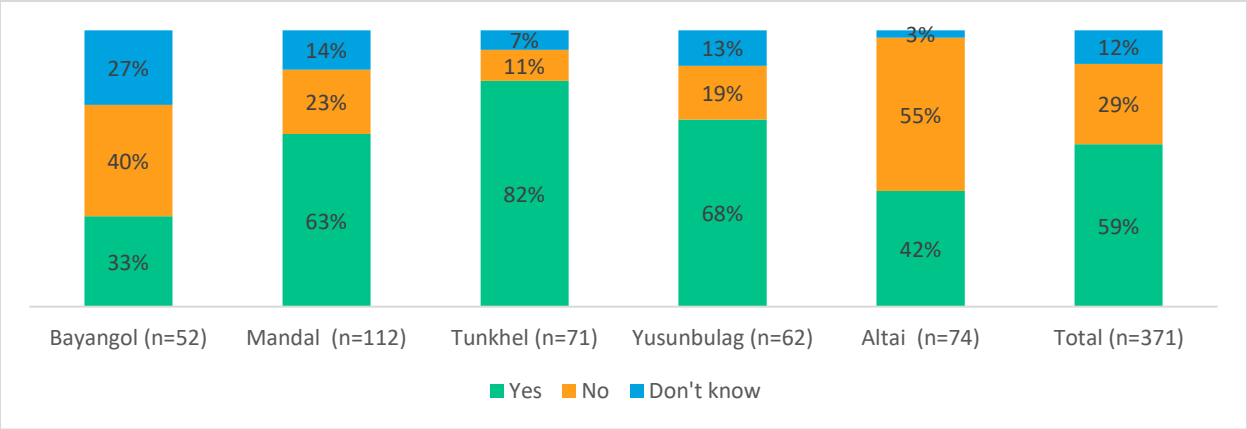


Figure 3-2. Respondents whose mining organization has a gold mining contract with local authorities, by study area and total

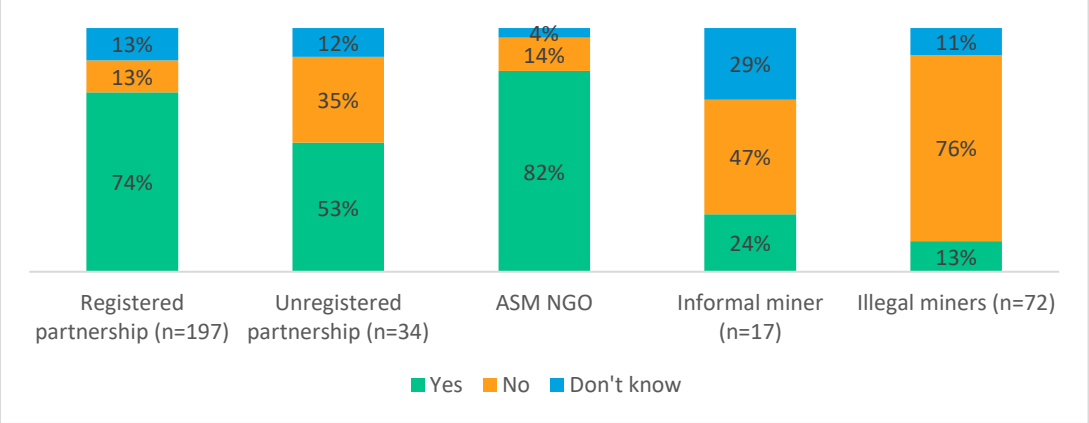


Figure 3-3. Respondents whose mining organization has a gold mining contract with local authorities by form of organization

Challenges in Obtaining Mining Related Permits

Asked whether they perceive any challenges in obtaining mining related permissions and contracts, 37% of survey participants answered with yes (Figure 3-4). More miners in Yusunbulag (56%) and Mandal (47%) have perceived difficulties in obtaining permits. Women (46%) were more likely to report challenges than men (34%). Considering the form of organization, organized miners reported more often issues with obtaining permits, most likely due to the fact that miners with illegal status cannot enter into a formal process to apply for a Land Conclusion.

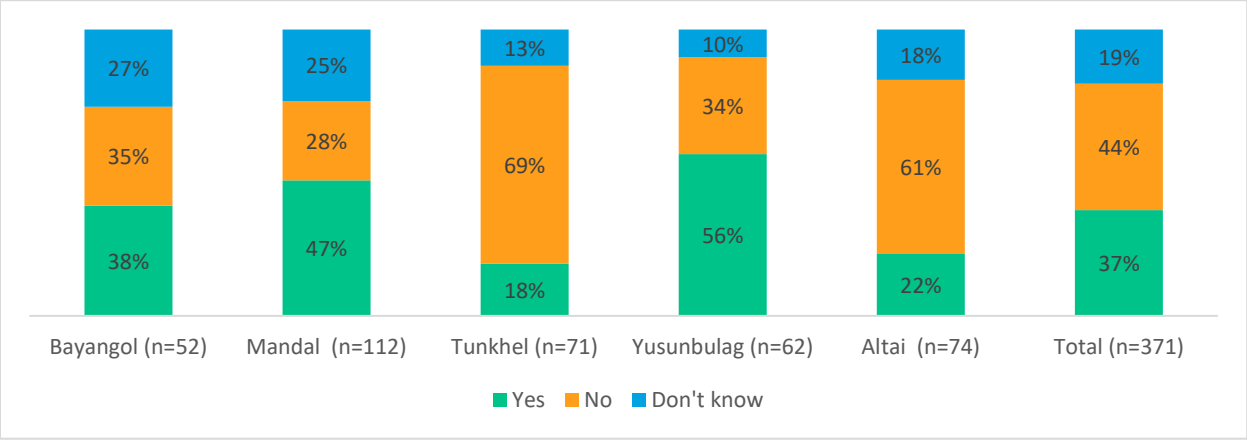


Figure 3-4. Respondents who have perceived difficulties in obtaining mining related permissions by study area and in total

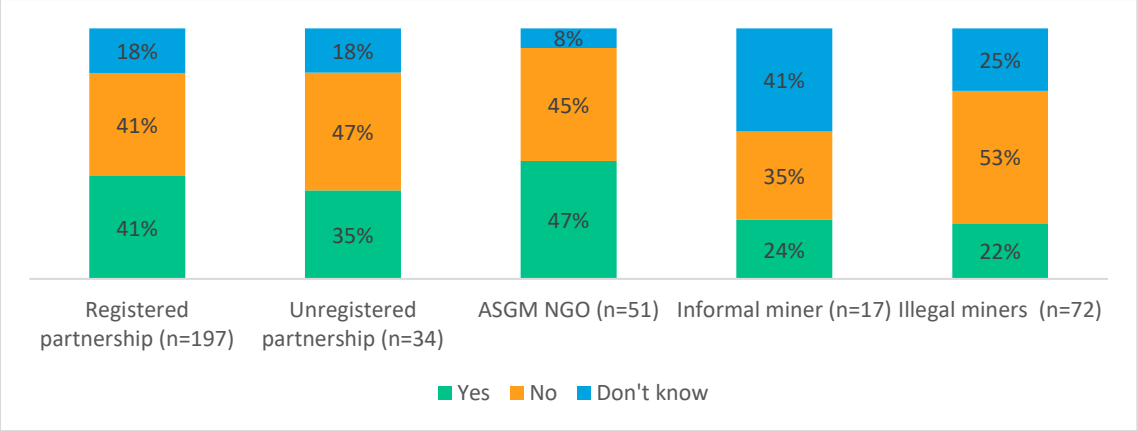


Figure 3-5. Respondents who have perceived difficulties in obtaining mining related permissions by form of organization

From those respondents reporting challenges, 32% had problems with obtaining Land Conclusions and signing agreements, 9% reported that they often face eviction, whereas 8% reported unfair procedures and another 8% problems with identifications papers (Table 3.5-3).

Table 3.5-3. Challenges of respondents in obtaining mining related permissions and contracts, by study area and total

	Bayangol (n=20)	Mandal (n=53)	Tunkhel (n=13)	Yusunbulag (n=35)	Altai (n=16)	Total (n=137)
Many procedures	5%	2%	8%	3%	0%	3%
Unfair	15%	11%	0%	3%	6%	8%
Bureaucratic	0%	6%	0%	14%	0%	6%
Lack of knowledge and information	5%	0%	0%	0%	19%	3%
Always chase	15%	2%	8%	20%	0%	9%
Policeman	0%	2%	8%	0%	0%	1%
Contract and permission issues	**20%**	38%	15%	**37%**	**31%**	**32%**
Land issues	0%	4%	15%	11%	6%	7%
Documentation issues	5%	4%	31%	3%	19%	8%
Inspection and fine	5%	2%	0%	0%	0%	1%
Election	0%	4%	0%	0%	0%	1%
Rehabilitation	0%	2%	8%	0%	0%	1%
Explosion	0%	2%	0%	3%	0%	1%
Finance	5%	2%	0%	0%	0%	1%
Forming partnership	0%	6%	0%	0%	0%	2%
Others	25%	15%	8%	6%	19%	14%

The results of the survey respondents and KII confirm the often-cited challenge for miners to secure a contract and permissions. Establishing partnerships does not seem to be a problem in almost all sites. Interestingly, respondents did not name challenges related to finance, explosion permits and environmental rehabilitation.

Conclusions

The main reason why people engage in artisanal gold mining is due to the lack of permanent jobs in the countryside, insufficient wages, loss of livestock, and seeking additional income. More than 50% of the respondents answered that they work under an agreement with the governor in the area where the Land Conclusion is issued, however getting those mining related permissions remains the most difficult problem for them.

By distorting the capacity (3,500 cm^3) of artisanal mining equipment specified in Resolution 151, medium-sized companies operated under the guise of artisanal mining to avoid taxes and environmental responsibility. This has caused a further decline in the reputation of artisanal miners. Resolution 355 was approved to take measures to abolish the illegal activities and environmental degradation. As a result, Resolution 151 has temporarily stalled progress in the formalization of the sector - resulting in artisanal miners not being able to claim land and extend their contracts. The taskforce led by the MMHI has been created to amend ASM Regulation 151 is currently working on the amendment, at the time of writing this study.

Although artisanal miners can be classified as formal, informal, or illegal, the ability of formal artisanal miners to work in a formal set up (with Land Conclusions and/or local contract) depends largely on the availability of official land and can only be classified as with or without official land permission. Artisanal mining contracts are made usually for one year and are extended based on the environmental rehabilitation performance, but there are many cases where the contract is delayed or not renewed. During the absence of a contract, there is a lot of instability, such as community members continue working informally or illegally elsewhere.

The case of the ASM organization in Tunkhel shows that it is easier to monitor artisanal mining with an official land permission and enforce relevant regulations. On the opposite side of the spectrum, in the Nart mining area of Bayangol, people have been mining since 1997, but it has not been formalized yet. This makes it challenging to monitor occupational safety standards and land rehabilitation, having caused environmental degradation, and hidden mercury use.

Due to the slow and inconsistent formalization of the ASM sector, it is difficult for artisanal miners to meet the current requirements. The unevenness in which formalization is unfolding also creates a growing disincentive for miners to take the formalization path.

The results of the report point not to any major significant findings, but rather affirms the consistency of the problems miners are facing as they attempt to take the first step to formalization. For the Mongolian Government to comply with its Minamata obligation, it needs to address these persistent issues.

4. Mining Practices

4.1 Mining and Ore Processing

4.1.1 Background on Mining

Mining is the process of extracting useful minerals from the earth's surface. In general, the lifecycle of any mining operation includes activities on exploration, development, operation, decommissioning, and post-closure. Over the course of this lifecycle, miners collaborate to investigate the geological constraints of the ore body and determine the economic feasibility of ore extraction, as well as establish mineral processing practices that are safe and sustainable.

Key technical differences between LSM and ASM mining processes include:

1. Type and capacity of equipment and machinery used in the operations which determines the degree of manual labour involved (e.g., haul trucks vs. hand tools). For example, the ASM Regulation in Mongolia dictates that artisanal miners are limited to using equipment with internal combustion engine capacities not exceeding 3,500 cm^3;
2. Scale of operation in terms of volume of material extracted, also known as the mining throughput;
3. Gold content of raw ore (cut-off grade). The gold content in LSM is much lower, usually below 10 g/t, as compared to ASM where gold grades upwards of 100 g/t are not unheard of (AGC, 2019)
4. Awareness and degree of adoption of occupational health and safety.

Info Box 9: Gold deposit types

Alluvial/placer deposits: Alluvial or placer gold deposits are accumulations of free gold flakes, particles or larger nuggets in loose, unconsolidated material that have been eroded from rocks. Placer gold is extracted from sediment through manual or mechanized washing to separate and concentrate gold which utilizes large amounts of water (Muff, 2012). Placer mining can occur in both new, unexplored mining sites or previously worked areas which involves the reprocessing of old tailings. Mercury is generally not used in Mongolia in this extraction process, but environmental impacts are significant as sluicing operations require high water use and may have the potential to pollute aquatic systems as with any industrial operation involving machinery. Another significant impact is the potential damage to riverscapes from heavy machinery used for dredging. Usually, a simple gravimetric circuit is all that is required to recover placer gold as this "free gold" is coarse and already liberated.

Primary/Hard rock deposits: Primary or hard rock deposits are formed when valuable minerals are disseminated in altered rocks (skarn), supergene enrichments, or veins. Development of hard rock gold deposits usually begins when vein outcrops contains gold mineralization are identified. Further exploration ensues, and if the extracted ore is deemed economical, shafts and tunnel systems are built to follow along the main vein. Artisanal miners primarily use hand tools (pickaxe, crowbar, shovel) and electric tools

(electric hammer, winch) in the process to harvest ore which is then gathered into sacks and transported to a processing facility where gold extraction can occur.

In Mongolia, ASGM consists of alluvial gold mining and hard rock gold mining (See Info Box 9). Processing techniques associated with both mining types are discussed in the following sections. In the recent years, Mongolian artisanal and small-scale miners have shifted to hard rock deposits as they are able to recover more gold as compared to high grade placer reserves which have become depleted.

4.1.2 Ore Extraction in the Study Areas

This section discusses the characteristics of the mining sites in the study areas, the different work structures amongst miners, common mining tools and practices, ore extraction data, and challenges faced relating to ore extraction.

Mining Site Characteristics

Underground mining is predominant in all study areas. Underground mining at ASM hard rock sites consist of tunnel-gallery systems and are differentiated only by vertical shafts and horizontal tunnels, the latter which can be referred to also as drifts or adits. A horizontal tunnel requires less intensive labour and is safer for mining operations. Within the five surveyed soums there are two adit operations, one in Mandal and the other in Tunkhel. The other systems are all vertical in nature, with drifts branching out periodically as a function of mineralization. Drifts are created by artisanal miners as they follow the high-grade gold veins horizontally Once the main veins are identified, miners dig along the drift and selectively target the highest value ore while avoiding the surrounding waste rock as much as possible. This is known as high grading, which differs significantly from LSM operations where the dilution factor is much higher due to the use of lower selectivity mining techniques as a trade-off to high-volume recovery. When the main vein begins to taper, miners must tunnel in a different orientation in hopes to intercept the vein again. This is why single shafts consists of sub-level and stopes.

Table 4.1-1 displays the number of shafts and the variability in shaft dimensions at each study area. From surveyed ASGM sites, the deepest vertical shaft (200 m) used by miners is an abandoned shaft in “Boroo Gold” that was once created as part of a LSM operation in Bayangol soum. However, the deepest shaft excavated by artisanal miners is closer to 80 m. The longest horizontal tunnel reaches 85 m in Tunkhel.

Table 4.1-1. Locations of shafts and shafts type

Location and shaft type	Number of shafts	Depth (vertical shaft) or length (horizontal shaft) (meters)	Shaft diameter (meters)
Bayangol, vertical	5	80 (ASM), 200 (LSM)	1.0-1.5
Mandal, vertical shaft	6	25-30	1.0-1.5
Mandal, horizontal tunnel	1	80	2.0-2.5
Tunkhel, vertical shaft	16	65	1.5-1.5
Tunkhel, horizontal tunnel	1	85	2.0-2.5

Altai, GA, vertical shaft (Yusunbulag miners)	20	5	1.0
Altai, open pit	1	10	10*10

Organizational and Work Structure

When assessing on-site work routines, 45% of respondents (165 miners) answered that they worked in shifts and 55% of respondents (206 miners) stated that they did not work in shifts but worked as needed. The high percentage of respondents not working in shifts may be explained by the lack of formalization of the mining operations in the various locations.

In terms of working in shifts, miners in Nart site had more frequent rotations possibly due to the fact that informal mills are located within close proximity of the mining sites and depend on mill capacity. More importantly, informal miners may feel the need to rush the process to extract the gold from fear of confiscation and incarceration due to their informal status. The below figure shows working shift data of the study's regions.

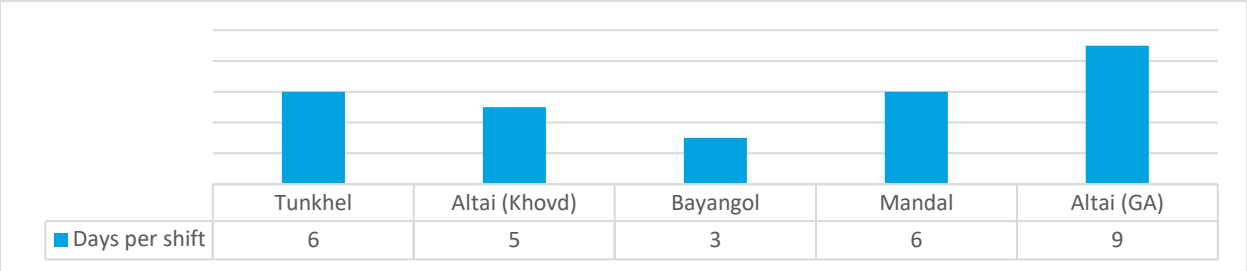


Figure 4-1. Term of shift by study area (n=165)

A partnership member in Selenge aimag explained a typical shift day as follows:

> *We work in shifts and one shift continues for about 7 days. In the morning when we start the mining activity, we put on safety uniforms and get safety instruction before operation starts and sign on the safety book and then check the mining site and shaft. 5 to 7 people work in our shift as a brigade: 3-4 people work underground for extraction, one works as cook, and one person works on the winch. We work for 3 to 4 hours in the morning, rest for 1 to 2 hours, and work 3-4 hours in the afternoon.*
>
> **KII, partnership member, Selenge aimag**

Mining Tools and Practices

Ore extraction is primarily performed using manual and powered mining tools. According to the results of the survey, the most commonly used tools and equipment are electric hammers or jackhammers, winches and crowbars. Heavy machinery such as excavators, loaders and haul trucks are not widely used as a result of restrictive ASM regulations governing maximum allowable engine size.

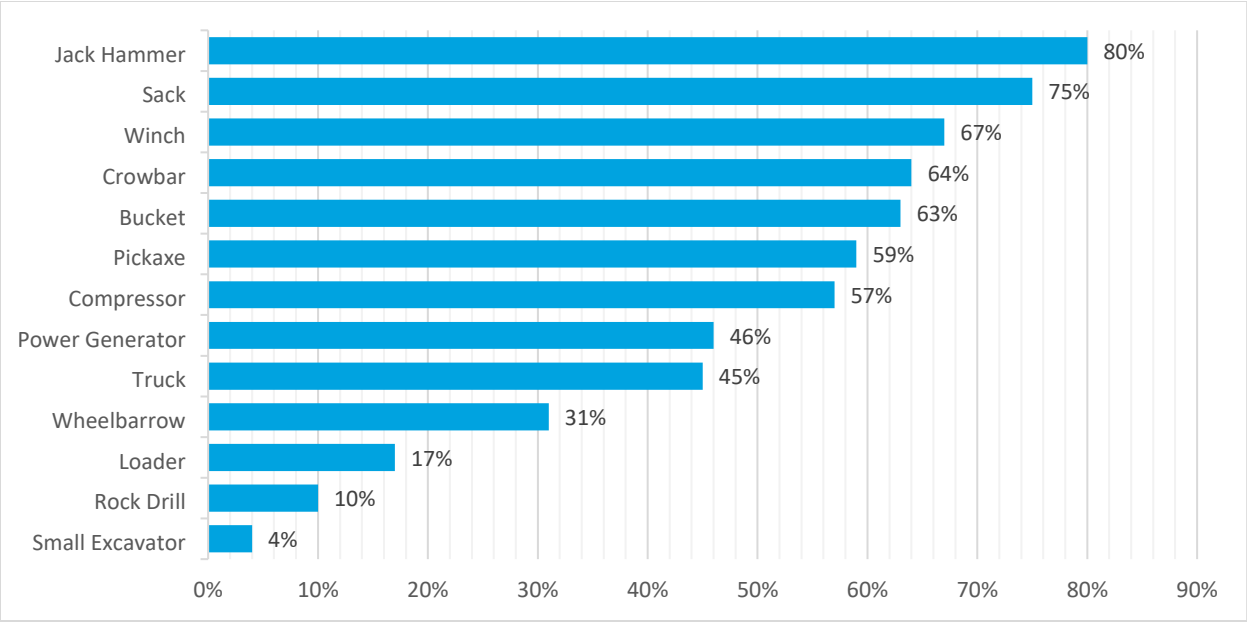


Figure 4-2. Tools and equipment used by respondents for extraction (n=371)

Hard rock mining oftentimes requires blasting due to ore hardness as shafts increase in depth. If performed correctly, blasting allows ore to be extracted more quickly than manual methods. However, blasting is not only expensive but must be outsourced to licensed companies with the required expertise. Therefore, most artisanal miners cannot consider the use of blasting despite expressing a desire to. Once the ore is broken down, it is collected in sacks and hoisted out of shafts using a manual or electric winch operated by workers on the surface. The average weight of a sack across all study areas is around 50-100 kg. A detailed breakdown is provided in Figure 4-3.

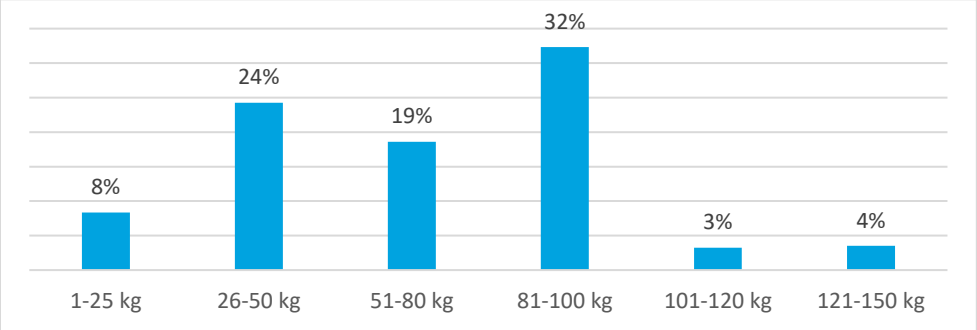


Figure 4-3. Average weight per sack (n=371)

Hard rock gold mining can operate year-round as they are based underground so are protected from the elements, especially from the harsh winters of Mongolia. However, artisanal miners mainly work for only seven to nine months in a year, primarily from April to November, due to other commitments to alternative income sources such as herding and farming (Section 6.2).

Ore Extraction Data

As indicated in Table 4.1-2, single partnerships extract ore at a rate of 120-370 kg/day, with an average production rate of around 250 kg/day. An average of 121 days/year, or roughly four months per year, are spent directly at mine shafts for ore extraction. The remaining three to four months in a year relating to mining activity are spent for ore transportation, processing, gold trading and resting. The highest producing site in Mandal extracts 580 t/year. This is achieved by the "Shijir Khishig" partnership through use of blasting and creating horizontal tunnel systems. In Altai, the lowest extraction site, production is only 71 t/year.

Table 4.1-2. Average annual ore extraction by study area

Location	# of partnerships	Avg. daily extraction, by partnership (kg/day)	Avg. daily extraction, by region (t/day)	Working days (days/year)	Avg. annual extraction (t/year)
Bayangol	10	237	2.37	124	294
Mandal	16	283	4.53	128	580
Tunkhel	14	225	3.15	142	447
Yusunbulag	10	120	1.2	115	138
Altai	2	370	0.74	96	71
Average	-	247	2.4	121	306

Survey findings in terms of annual production align roughly with existing knowledge of the study areas, as Mandal has been a historical mining region with 20 years of known mining activity. In contrast, Gobi-Altai and Khovd aimags are newer mining area with limited exploration and no existing or permitted processing plant service providers (AGC, 2019).

Challenges Faced

Common ore extraction challenges miners face ranked in order appear to be the lack of proper equipment (59% of respondents), funding (52%), blasting permission (50%) and acquisition of land permits (50%). It should be noted that study areas with more advanced mining development, such as Tunkhel, identified issues related to blasting as their biggest barriers as these mining groups prioritize increasing their extraction capacities to produce more gold. Study areas like Bayangol and Yusunbulag are less developed, and in turn prioritized more rudimentary concerns such as acquiring general permission or license to mine.

Table 4.1-3. Most common challenges faced by miners, total and by study area

Challenges	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusunbulag (n=62)	Altai (n=74)	Total (n=371)
Lack of equipment	56%	47%	59%	63%	76%	59%
Lack of funding	50%	53%	62%	37%	54%	52%
Blasting permission	46%	52%	73%	55%	26%	50%
Land permission	54%	45%	45%	58%	53%	50%
General permission	64%	53%	37%	55%	28%	47%
Lack of ore supply	44%	48%	51%	37%	37%	44%
Lack of human resources	39%	36%	54%	34%	30%	38%
Blasting complications	37%	44%	54%	40%	10%	37%
Lack of capacity	31%	37%	52%	40%	20%	36%
Weather conditions	35%	33%	39%	45%	24%	35%
Lack of exploration	44%	33%	47%	29%	15%	33%

Dewatering	37%	27%	31%	31%	24%	29%

In terms of access to financing, 53% of overall respondents indicated that if their financial situation improved, their first priority would be to invest in better equipment. Regionally, miners from Bayangol (15.4%), Mandal (10.7%) and Altai (13.5%) soums would prioritize land permits next, while in Tunkhel (14.1%) and Yusunbulag (12.9%), artisanal miners would prioritize obtaining blasting permits. Figure 4-4 shows preferences for business development in detail.

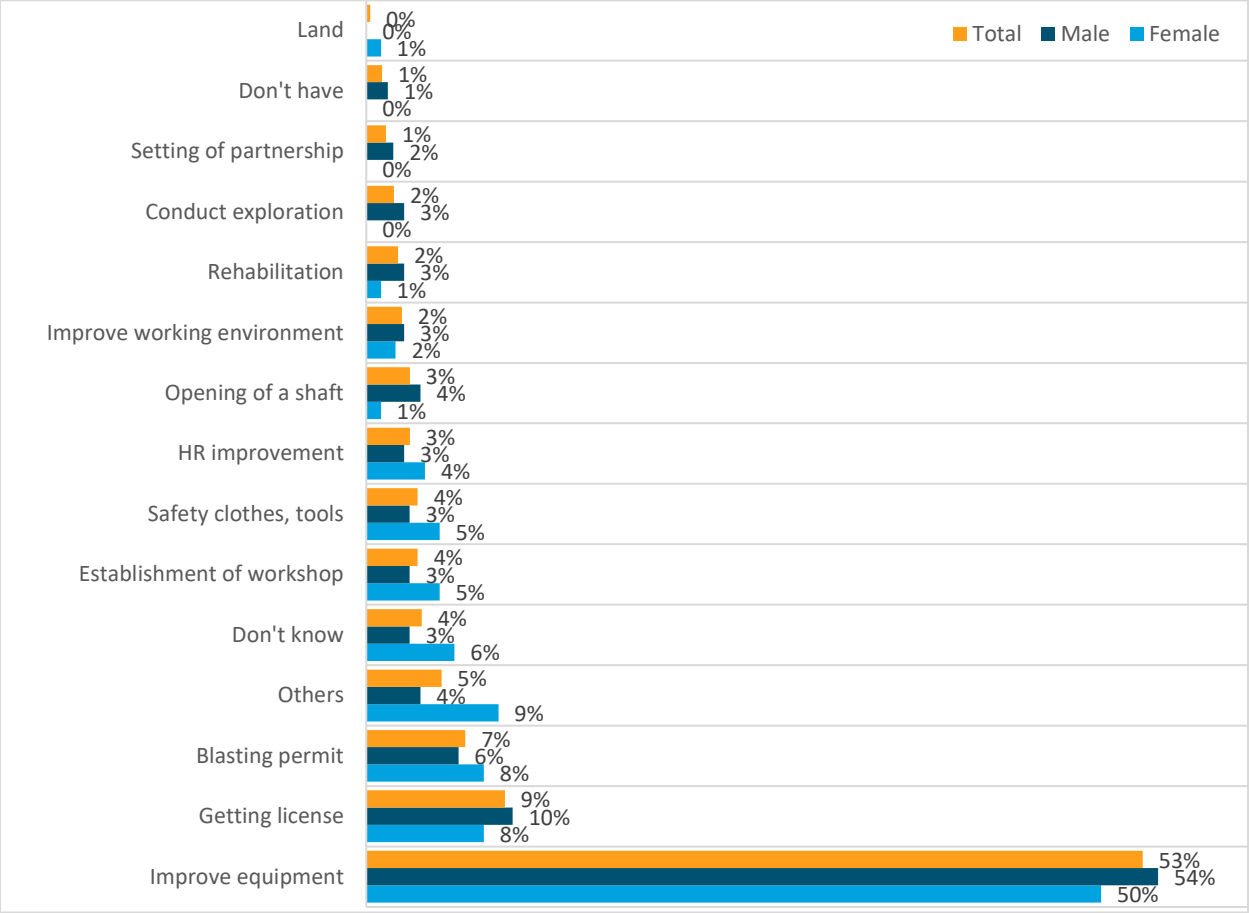


Figure 4-4. Preferences for business improvement (n=371; 100 women and 271 men)

4.1.3 Ore Processing in the Study Areas

This section discusses the ownership, availability and preference of processing facilities, general processing plant configurations, ore processing practices, ore and production data, and processing costs.

Ownership, Availability and Preference of Processing Facilities

ASGM ore processing in Mongolia is conducted by both permitted and non-permitted service providers. Processing plants are regulated by the "Processing Plant Requirements

and Operational Procedure" (PPROP) approved in 2019 by Order A/205 of the Minister of Mining and Heavy Industry. In the procedure, there is no distinction between large and small-scale processing plants.

More than 40 official documents are required to obtain a permission for ore processing from MMHI and MET, and a key document is the environmental impact assessment. The process of approving a detailed environmental impact assessment is slow and difficult to get approved and quite costly, especially for artisanal miners. Informality of the gold processing part is directly related to the informality of the ASM sites. The inability to determine the origin of local minerals and the insufficient number of official artisanal miners are the main reasons why the MET does not approve a detailed environmental impact assessment.

The PPROP includes several important provisions, including the registration of origin and quantity of gold ore explored by artisanal miners, the registration of artisanal miners, the special provision in agreeing with artisanal miners to manage the costs from the processing of industrial waste and in following health and safety standards. The processing plants are required to comply with applicable regulations and to have all necessary permits in place, as they will be shut down for non-compliance. With these requirements and restrictions caused by Resolution 355 as well as COVID-19, many processing plant operations in 2020 have been irregular.

The study estimates that there are 12 small-scale gold processing plants and 13 mills in Mongolia. However, only two have proper operational permits, those being the Khongoriin Khuder plant in Bayan-Ovoo soum of Bayankhongor aimag and Gobi Uguumur Khairkhan plant in Khankhongor soum of Umnugobi aimag. Some mining partnerships operate their own informal processing plants, while others can only resort to utilizing third-party processing plants and accepting whatever, usually unfavourable, conditions are offered to them by the owner. All known processing facilities in Mongolia are listed below.

Table 4.1-4. Small-scale gold processing plants and mills in all of Mongolia

№	Processing plant name	Size	Capacity	Location
1	Goviin Uguumur Khairkhan LLC	Processing plant	7 t/day	Khankhongor soum, Umnugobi aimag
2	Khongoriin Khuder LLC	Processing plant	10 t/day	Bayan-Ovoo soum, Bayankhongor aimag
3	KHAMO LLC	Processing plant	10 t/day	Bornuur soum, Tuv aimag
4	Mandal Khishig Khairkhan local-government owned entity	Processing plant	12 t/day	Mandal soum, Selenge aimag
5	Surleg Mandal Cooperative	Processing plant	-	Mandal soum, Selenge aimag
6	Mandal Tugul NGO	Processing plant	-	Mandal soum, Selenge aimag
7	Mongol Shintan LLC	Processing plant	-	Mandal soum, Selenge aimag
8	Tunkhel	Processing plant	7 t/day	Mandal soum, Selenge aimag
9	Shijir Khishig	Processing plant	5 t/day	Mandal soum, Selenge aimag
10	Altan Teerem	Processing plant	5 t/day	Yusunbulag soum, Gobi-Altai aimag
11	Tserenpuntsag's processing plant	Processing plant	2 t/day	Yusunbulag soum, Gobi-Altai aimag
12	Bayarjargal's processing plant	Processing plant	5 t/day	Altai soum, Gobi-Altai aimag
13	Bayangol mills	9 mills	total 9 t/day	Bayangol soum, Selenge aimag
14	Altain Govi Tsonj	Mill	2 t/day	Altai soum, Khovd aimag
15	Nameless	3 mills	-	Bulgan, Tsetseg soums, Khovd aimag
16	Nameless	Mill	-	Yusunbulag soum, Gobi-Altai aimag

Currently, there are no officially permitted processing plants in the five study areas. There are about nine private mills in Bayangol, six non-permitted processing plants in Mandal, one non-permitted processing plant in Tunkhel, two non-permitted processing plants in Yusunbulag and one non-permitted mill in Altai.

Overall, 68% of miners stated that they were able to utilize a nearby processing plant to their mining site, although regional accessibility varied between 94% in Tunkhel and 5% in Altai. Approximately 24% of the respondents travelled up to 100 km and only 2% indicated that they would travel over 400 km for processing. Altai was a clear outlier with 95% of miners stating they were not within close proximately to processing facilities, which again reflects the remoteness and consequent development and history of each mining region, with more established regions equipped with more processing infrastructure.

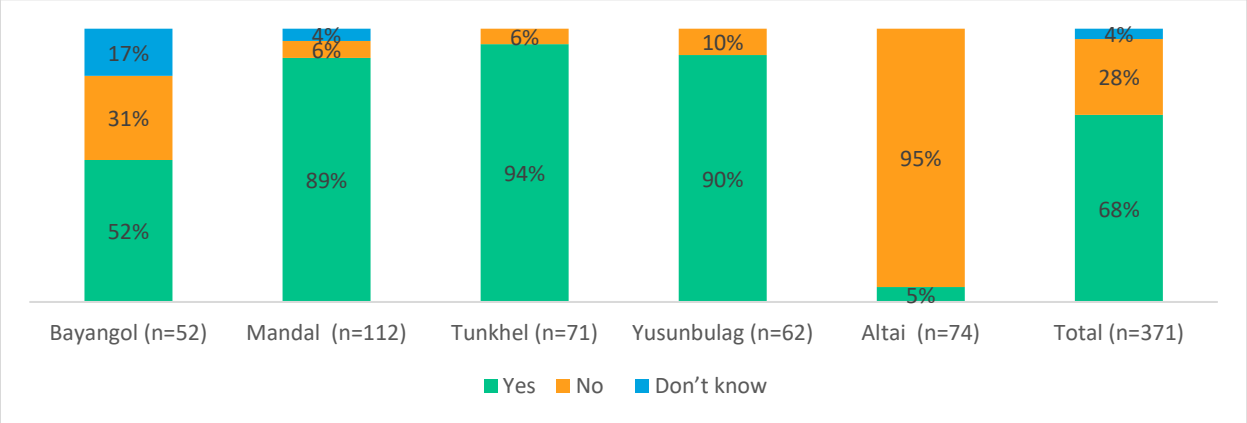


Figure 4-5. Response to if mining site is nearby (<25 km) to any processing facilities

In terms of ownership and facility preference, 34% of respondents indicated to have their own processing facilities, whereas the majority of respondents (46%) are found to transport ore to a nearby processing plant and 22% to a processing plant in another soum. A small number of miners in Altai (12%) admitted that ore is transported from the mining site to their homes for processing, indicating a potential for mercury use in the absence of other equipment and overall lack of processing options.

Table 4.1-5. Where ore is processed by miners

	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusunbulag (n=62)	Altai (n=74)	**Total (n=371)**
Own processing facility	37%	31%	14%	55%	39%	34%
Nearby processing facility	42%	57%	54%	52%	22%	46%
Processing facility in another soum	15%	9%	55%	6%	28%	22%
Home/fenced areas	0%	0%	0%	0%	12%	2%
Don't know	10%	4%	0%	0%	4%	3%
Other	0%	0%	0%	0%	1%	0%

Continuing the discussion of facility preference, the survey results revealed that processing plants were chosen for specific reasons. Most respondents stated that processing plants were chosen preferentially based on a perceived high gold recovery rate

(27%), because there was no other choice in their area (25%) or because of the proximity of the facility (20%). A total of 12% of respondents reported that mercury-free processing would also influence their choice. Results further reemphasizes the remoteness of Altai miners as 52% responded that they had limited processing options. The more sophisticated Tunkhel miners made their choice more often based on the efficiency of a facility (54%).

Table 4.1-6. Reason for selection specific processing plants or mills

	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusunbulag (n=62)	Altai (n=74)	Total (n=371)
Processing plant offers financing	6%	12%	6%	5%	0%	6%
Closest to mining site	17%	19%	28%	29%	7%	20%
Lower price	29%	21%	13%	16%	4%	16%
Belongs to own partnership	10%	9%	6%	10%	11%	9%
Have personal contract	12%	7%	4%	2%	16%	8%
Have barter terms	8%	3%	3%	2%	0%	3%
Mercury-free processing	12%	13%	13%	21%	1%	12%
High gold recovery	15%	29%	54%	32%	4%	27%
No other choice	25%	13%	14%	19%	58%	25%
Just following order	2%	2%	0%	3%	1%	2%
Others	21%	24%	15%	5%	7%	15%

Processing Plant Configurations

Figure 4-6 illustrates a typical ASGM circuit found in mercury-free processing plants. These mercury-free plants comprise of several unit processes including comminution in the form of crushing and grinding, gravimetric concentration, and a purification stage.

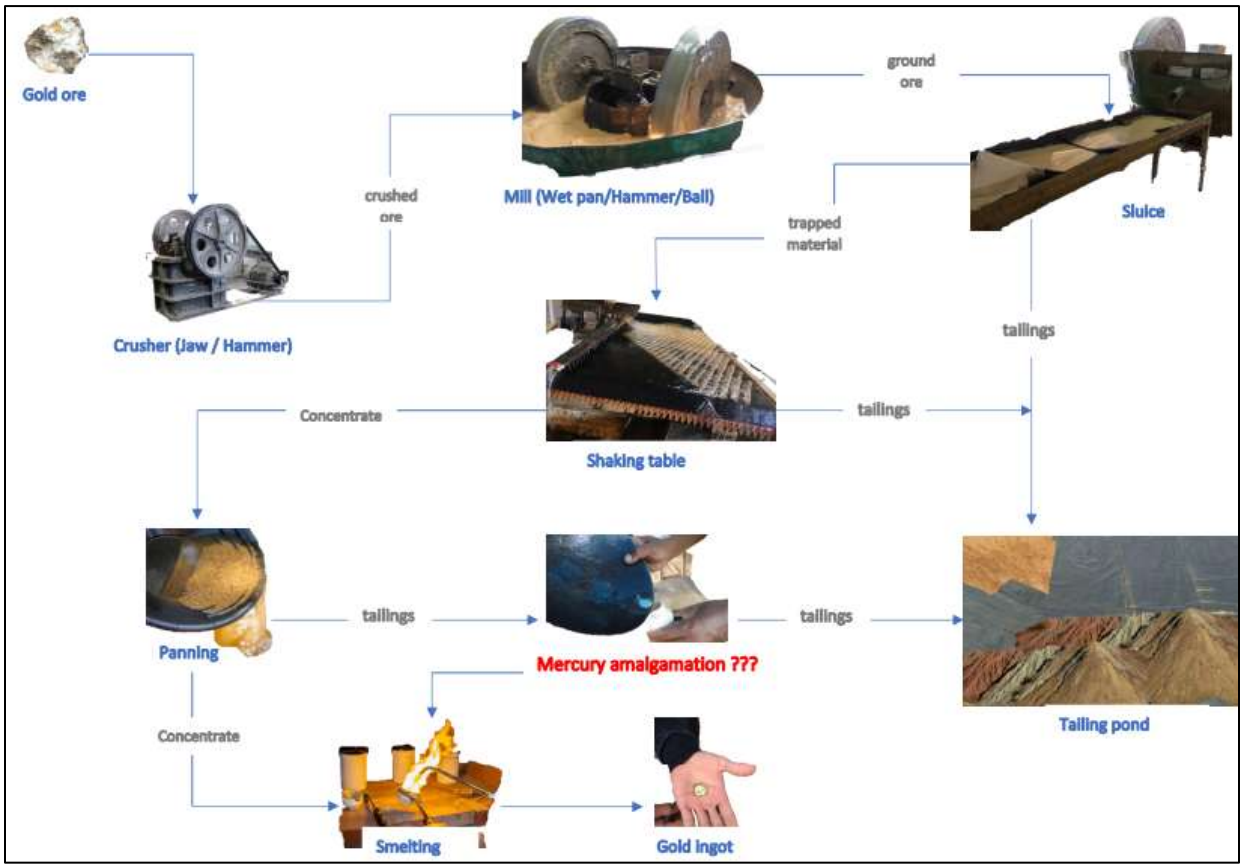


Figure 4-6. Ore processing flow diagram

In more detail, ore is usually crushed by a jaw crusher, although sometimes hammer crushers or hand tools are used depending on the level of sophistication of the facility. Run of mill ore is reduced to a desired particle size before advancing to the grinding stage involving the use of wet pan mills to achieve further liberation of gold particles. Next, in the concentration process, slurry overflow from the wet pan mills is passed over sluices, where concentrate is captured on either rubber mats or carpets depending on the specific facility. The sluice tailings are deposited in the tailings pond. It should be noted that a significant portion of gold is retained in these tailings and kept by the process plant owner for further reprocessing that is conducted by third-party cyanidation facilities. All sluice concentrate and wet pan mill bed material are upgraded on a shaking table, with shaking table middlings being hand panned. This material can be reprocessed on shaking table or may at times be subjected to mercury amalgamation separately in an attempt to achieve maximum recovery. Shaking table tailings join sluice tailings in the tailings pond. The combined shaking table and hand panned concentrate undergoes a purification process involving nitric acid before it is smelted with borax, a flux, to obtain a final gold ingot. A flow diagram is provided above.

In contrast to larger, more industrial third-party processing plants, some miners operate smaller, private mills themselves. Crushing is sometimes conducted by jaw crushers, but hand crushing and hammer mill methods are also used. The private mills concentrate gold by using sluices covered with rubber mats to trap the denser gold particles which is then panned by hand in absence of more elaborate technologies like shaking tables. The gold concentrate is upgraded using magnets to remove any ferrous gangue minerals before smelting. Without access to more sophisticated gravimetric technologies like shaking tables as compared to sluices, miners can be more prone to resorting to mercury amalgamation in an attempt to achieve higher recoveries.

Ore Processing Practices

According to the survey, 185 respondents (50%) answered that the ore is mostly crushed by a jaw crusher. Manual processing was mostly prevalent in Altai (62%). Survey results also suggested that ore was largely ground by hammer mill (38%) or wet pan mill (38%).

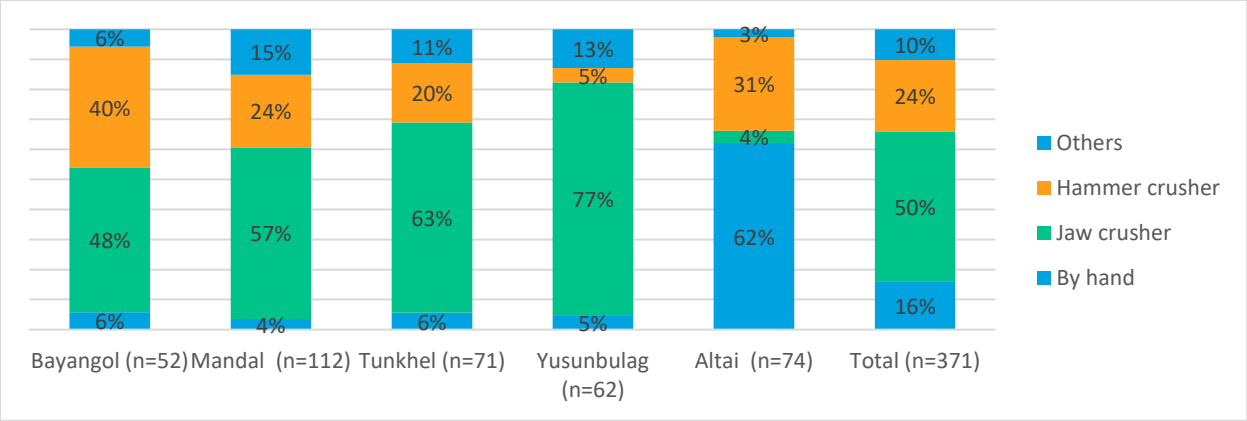


Figure 4-7. Ore crushing methods, by study area and total

Hammer mills are more primitive, lower efficiency grinding technology, whereas wet pan mills are more sophisticated. The study areas with highest hammer mill use are Bayangol (77%) and Altai (85%). Regions with greater mining activity are expected to have more capital to purchase and upgrade to more better technologies like pan mills as reflected by the responses.

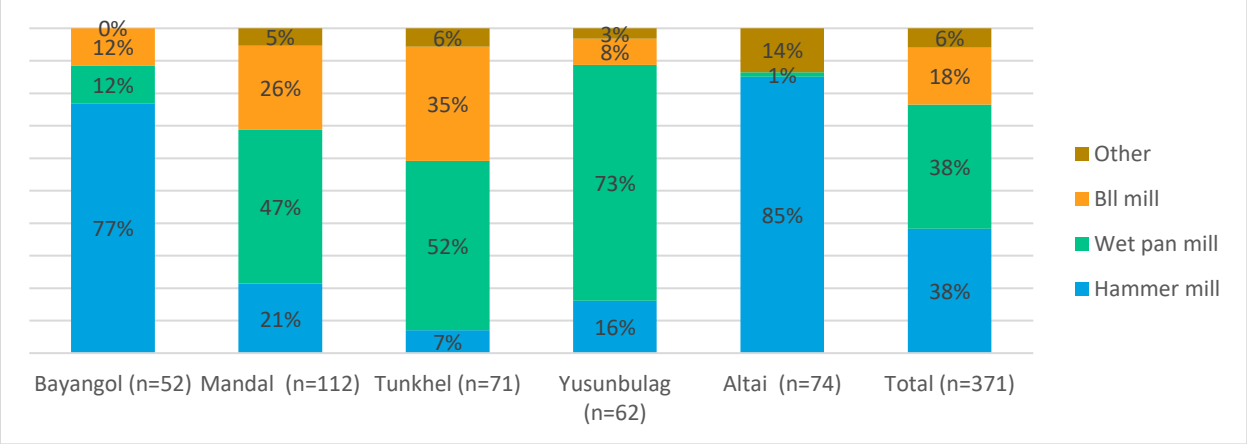


Figure 4-8. Mill types, by study area and total

Gold can be extracted from ore by applying different methods. During the survey, most respondents performed concentration via panning (73%), oftentimes accompanied by the use of a shaking table (47%) or prior sluicing (23%). Responses indicate that sluicing is used half as prevalently as shaking tables, but in reality, respondents were probably referring to operations that used sluicing as their single method of gold extraction. Virtually all shaking table operations are accompanied by sluicing beforehand, so processing with use of sluicing is actually around 70% (AGC, 2019). Amalgamation with mercury was only reported by 2% of all respondents, which is likely underreported due to mercury's illicit status in Mongolia.

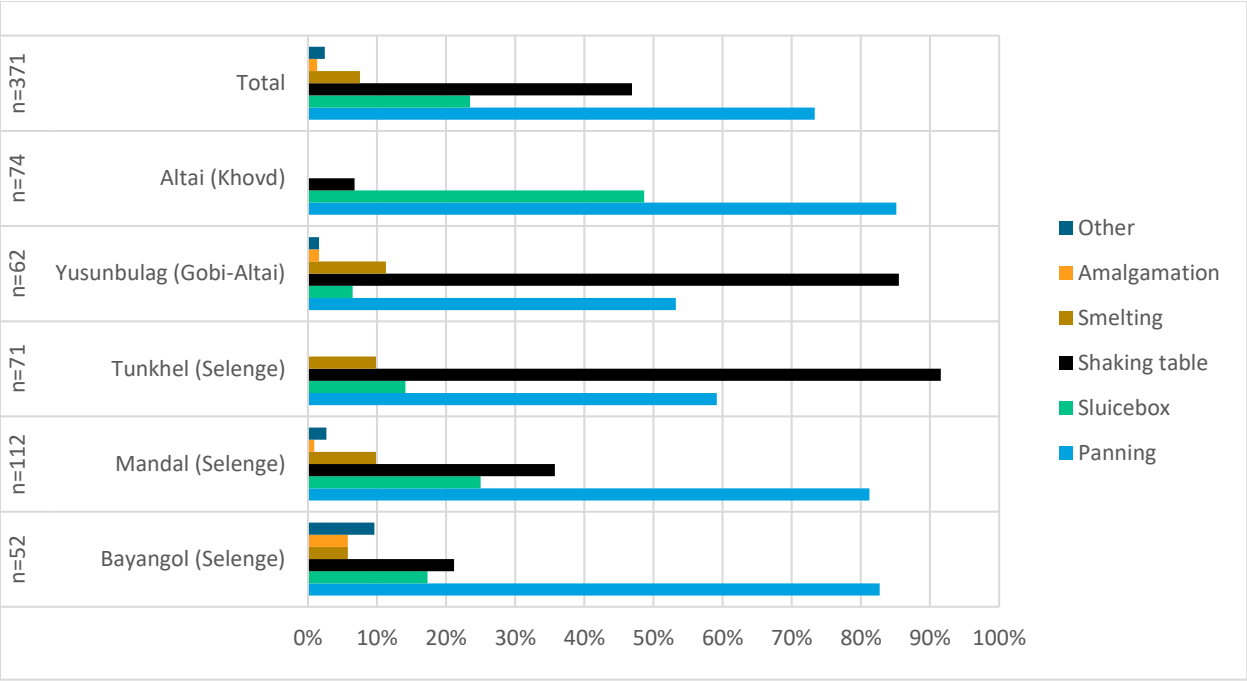


Figure 4-9. Ore processing methods, by study area and total

According to the survey, miners estimate on average that they achieve a gold recovery of 66% using processing plants. This means that miners assume that 34% of their gold is left behind as tailings stored in ponds at the profit of the plant owners (Figure 4-10). The method of how recovery is determined is largely based on miners' experience from detecting visible gold during hand panning as well as any previous knowledge of the targeted gold-bearing vein. Only 12% of miners analyzed their ore using laboratories, which is understandable as laboratory analysis is costly and access to an on-demand assays is highly uncommon in ASM.

Processing plants accumulate the tailings to be reprocessed at licensed, third-party cyanidation plants found in the Tuv aimag. Ten Hun LLC (also called Naran Tolgoi) is a gold processing cyanidation facility that buys ASGM tailings. Processing plants usually transport their tailings once or twice a year. The cyanide facility will assay tailings to determine rough gold content, and then negotiate a price with the small-scale processing plant owner while deducting operational costs. Average gold content in tailings of small-scale gold processing plant can be as high as 20 g/t depending on the plant's efficiency (AGC, 2019).

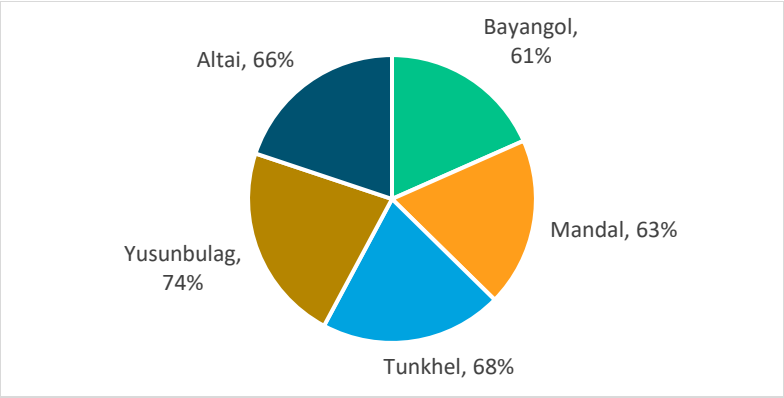


Figure 4-10. Gold recovery rate (in %) reported by respondents (n=371)

The survey also explored what changes miners would recommend improving existing processing plants. The response for improved equipment (30%) was nearly universal across all study areas. A high percentage of respondents from Bayangol (43%), Yusunbulag (34%), and Altai (25%) had no suggestion or did not know how to respond, which may again reflect the unfamiliarity with processing equipment as newer mining regions.

Table 4.1-7. Suggestions from miners on improving gold processing

	Region					Total		
	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)	Total (n=371)
Improve equipment	13%	29%	54%	18%	31%	22%	33%	30%
Improve operation	8%	5%	6%	10%	7%	7%	7%	7%
Increase gold content	8%	4%	10%	8%	0%	7%	5%	5%
Have high price	2%	11%	4%	2%	0%	5%	4%	5%
To be fair	8%	3%	3%	2%	1%	3%	3%	3%
Have formal licence/permit	8%	2%	0%	2%	5%	4%	3%	3%
Have own workshop	2%	4%	1%	0%	7%	4%	3%	3%
Be transparent	2%	4%	0%	0%	0%	2%	1%	1%
Improve control	0%	1%	1%	3%	0%	3%	0%	1%
Set new workshop	0%	0%	1%	0%	12%	4%	2%	3%
Less waste	2%	1%	0%	0%	3%	0%	1%	1%
Be ethical	4%	1%	1%	0%	0%	1%	1%	1%
Create competitiveness	0%	3%	0%	0%	0%	1%	1%	1%
Don't know	17%	11%	7%	8%	11%	16%	12%	13%
No suggestion	26%	14%	7%	26%	14%	16%	17%	16%
Others	0%	8%	4%	23%	9%	5%	7%	6%

Gold Production

An attempt was made to calculate gold production based on gold yield from survey data. Using gold yield expected per tonne of gold along with annual ore extraction data, annual gold production was calculated and ranged from 3.4 kg/year in Bayangol to 22 kg/year in Tunkhel.

Table 4.1-8. Gold production data

Location	# of partnerships	Avg. annual extraction (t/year)	Gold recovered per tonne of ore (g/t)	Gold purity (%)	Annual gold production (kg)

Bayangol	10	294	11.6	85.8	3.4
Mandal	16	580	27.4	84.1	15.9
Tunkhel	14	447	49.4	89.3	22.0
Yusunbulag	10	138	73.6	82.6	10.1
Altai	2	71	28.7	82.3	2.03
Average	-	306	38.1	84.8	10.7
Total	-	-	-	-	**53.4**

Survey areas ranked from most productive to least productive are as follows: Tunkhel, Mandal, Yusunbulag, Bayangol, and Altai. This data is similar to gold trade data presented in Chapter 7, which was directly derived from the survey respondents.

Table 4.1-9. Comparison of gold production data

	Highest				Lowest
Ch. 5 – gold production based on ore extraction data	Tunkhel	Mandal	Yusunbulag	Bayangol	Altai
Ch. 7 – data on gold production (weekly basis)	Tunkhel (53 g)	Bayangol (51 g)	Yusunbulag (44 g)	Mandal (39 g)	Altai (37 g)
Ch. 7 – data on gold sold (weekly basis)	Tunkhel (34 g)	Bayangol (32 g)	Altai (28 g)	Mandal (26 g)	Yusunbulag (20 g)

The three data sets were in agreement that Tunkhel is the highest gold producing study area. Bayangol is a particularly strong area in terms of gold trading, but not from an ore extraction standpoint. A loose conclusion can also be made that Altai is found to be one of the weaker gold producing survey areas.

Processing and Facility Establishment Costs

Average processing costs by region is summarized in Table 4.1-10. Processing costs are fairly consistent at around 200,000 MNT/tonne. However, Yusunbulag and Altai are reported to have slightly higher costs per tonne charges, which again may reveal the limited processing options of miners in those regions and ability for existing process plants to charge more. It should be noted that all the mills and processing plants surveyed operated without official permission and were shut down for inspection to meet the new requirements for processing plants by the local Professional Inspection Department.

Table 4.1-10. Average processing costs

Ore Source	Processing Facility	Processing Cost (MNT/tonne)
Bayangol (Nart)	Nart	100,000-150,000
Mandal (Noyot)	Mandal	150,000-200,000
Tunkhel (Bor Tolgoi)	Tunkhel, Bornuur, Mandal	150,000-220,000
Yusunbulag (Zamiin-Am)	Altai (GA)	250,000-300,000
Altai (Maikhan)	Altai	250,000

Currently, shaking tables and sluices are the only mercury-free technology available to small-scale miners. However, the financial barrier for entry is high in establishing a processing plant, as a mercury-free system imported from China costs about 200-250 million MNT ($70-$90k USD), along with an additional 100 million MNT ($35k USD) to

obtain proper permitting. During the interview process, a process plant operator in Mandal also mentioned the difficulty in maintaining properly calibrating equipment as servicing was expensive due to limited expertise. Chemical extraction methods, such as cyanidation, would allow for more efficient gold recoveries and thus higher profits, but are highly regulated in Mongolia (AGC, 2019).

4.1.4 Conclusions

Ore Extraction

Artisanal miners were found to extract ore at much smaller scales, in the order of hundreds of tonnes per annum, compared to LSMs that are able to mine thousands of tonnes per day. Artisanal miners compensated for these lower volumes by high-grading or targeting rich vein material while ignoring the host rock, and thus have much lower dilution factors. However, artisanal miners were often forced to abandon veins due to depth limitations, as further advances would require robust dewatering systems and/or use of blasting as water tables are breached and ore hardness increases. Lack of adequate capital for more sophisticated equipment and technologies along with proper permitting and restrictive regulations were common barriers identified that prevented miners from expanding their operations. The lack of geological exploration and resource identification also posed as significant challenges that discouraged further investment, although this is a common issue recognized globally by the ASM community.

The study highlights the phenomenon that ASM challenges evolve in a stage-wise manner as a mining operation grows. Although the lack of finance was found to be universal across all study areas, the types of investment miners would make if given access to funds was found to correlate to the degree of sophistication of their mining operations. Study areas with more advanced mining development like Tunkhel prioritized production, and thus profit, which was reflected by their respondents who identified blasting permission as the biggest barrier. Less developed areas like Bayangol and Yusunbulag were more focused on rudimentary concerns such as acquiring general permission to mine.

Ore Processing

As only two permitted processing plants exist in Mongolia, artisanal miners also attempt to obtain better pricing agreements by processing at non-permitted processing plants and private mills. The establishment of new processing facilities are heavily regulated and require significant capital investment in the range of 300-350 million MNT ($105-125k USD) which are out of reach for most ASGM partnerships.

The lack of processing options was reflected in the survey with 24% of respondents having to travel up to 100 km to processing facilities; 2% of respondents indicated that they would travel over 400 km for processing. This was especially pronounced in Altai and Bayangol which signals the remoteness and relative novelty of mining in those areas. There were 25% of respondents who indicated that processing facilities not chosen based on preference, but simply because no other options are available.

With only 34% of miners having access to their own processing equipment, the majority of miners relied on third-party processors and must accept whatever conditions, usually unfavourable, that were offered to them. Processing plants consisted of simple gravimetric

circuits, with grinding carried out by hammer mills 38% of the time and by wet pan mills 38% of the time. In terms of physical gold recovery, sluices were used 70% of the time while more sophisticated shaking tables were used 47% of the time. The common practice was for tailings to be kept by the process plant owners, which disincentivized the optimization of processing equipment. Respondents from the survey areas, on average, believed that only 66% of the gold in their ore is paid out to them, with the remaining 34% kept for the profit of process plant owners. In reality, gold tailings may contain as high as 20 g/t, which is many magnitudes higher compared to head grades of LSM operations (AGC, 2019).

Metallurgical accounting was found to be quite poor in all survey areas, with conflicting data reported for amount of ore extracted versus amount of ore processed; similar findings were reported for amount of gold sold versus amount of gold produced. The level of process control was low. Gold content was rarely determined through laboratory assays, with the majority of miners relying on empirical methods such as historical knowledge, panning for visible gold, and water density method to estimate gold purity.

The analysis of three data sets determined Tunkhel as the highest gold producing study area. Bayangol was found to be a particularly strong area in terms of gold trading, but not from an ore extraction standpoint. A loose conclusion can be made that Altai is one of the weaker gold producing survey areas.

4.2 Environmental Protection and Management

The legal prerequisite for environmental management and protection in the ASGM sector have been described in detail in Chapter 3. This section will focus on environmental practices relating to mining in the study areas, especially the compliance with environmental management plans including effective waste management and rehabilitation plans in accordance with the ASM Regulation 151.

4.2.1 Environmental Management Plans

As specified in Regulation 151, ASM partnerships are responsible for an approved environmental rehabilitation plan, a signed contract allowing minerals extraction by artisanal mining organizations, as well as contributing to a rehabilitation fund. As part of the Regulation 151, the Minister of Environment and Tourism and the Minister of Mining and Heavy Industry jointly approved the ASM Rehabilitation Methodology in 2017. The ASM Rehabilitation Methodology is an approach to rehabilitate and restore land degraded by ASM that is defined as being economically affordable, socially acceptable and ecologically viable. The methodology is primarily based on the Frugal Rehabilitation Methodology (FRM, 2016), which has been specifically developed for the rehabilitation of lands degraded by ASM. Rehabilitation is comprised of two components and is categorized as being either technical or biological. Technical rehabilitation is related to refilling and infilling excavation works as well as regrading and reprofiling the rehabilitation surfaces so that available topsoil can be replaced over the area in preparation for biological rehabilitation (ASM Rehabilitation Methodology, 2017). Biological rehabilitation is the

final phase of the rehabilitation process in which the site is revegetated and restored terrestrially to allow for natural, ecological regrowth.

Of the surveyed miners, 69% stated that their mining organization had an environmental rehabilitation plan in place (Figure 4-11). Among the study areas, the positive response rate was the highest in Tunkhel (86%) and the lowest in Bayangol (52%) and Altai (55%).

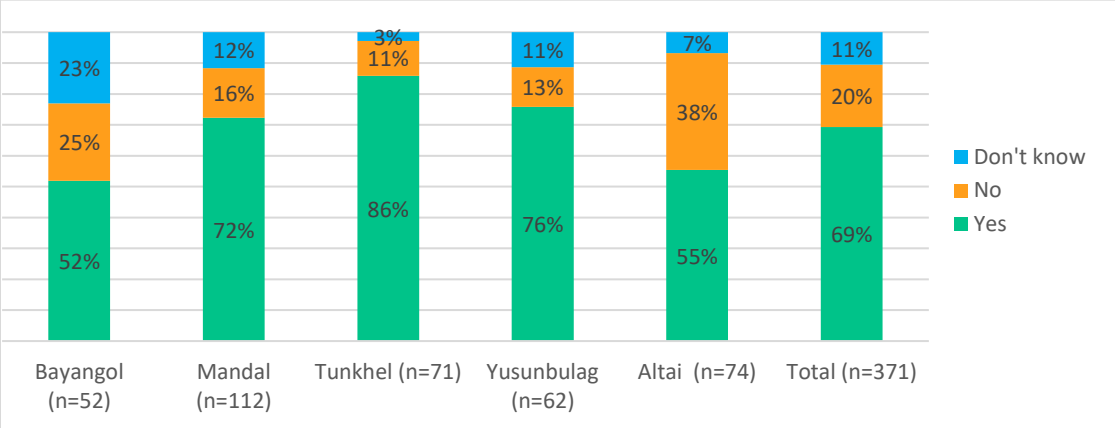


Figure 4-11. Percentage of respondents who reported that their respective ASM organization has an environmental rehabilitation plan

This finding is also supported by statements from ASM partnership leaders and miners during KII. Five out of eight interviewees responded that they complied with the regulation regarding the environmental rehabilitation plan.

Overall, 82% of miners interviewed responded that rehabilitation is conducted at their mine site. Only 9% responded that rehabilitation was not conducted, while the remaining 9% were not in a position to answer (Figure 4-12). Of the miners who partook in rehabilitating their sites, two thirds of respondents (69%) indicated the activity of backfilling as part of their rehabilitation efforts. However, this alone does not indicate that successful rehabilitation has been carried out. It was revealed through more detailed questioning that the primary purpose of backfilling is not for rehabilitation, but rather to deter other miners for pirating their ore and for ground stability purposes. Hence, genuine rehabilitation efforts amongst mining organizations may be overexaggerated. Furthermore, quantitative surveys revealed that only 3.8% of the surveyed miners conducted biological rehabilitation such as re-soiling land and replanting trees.

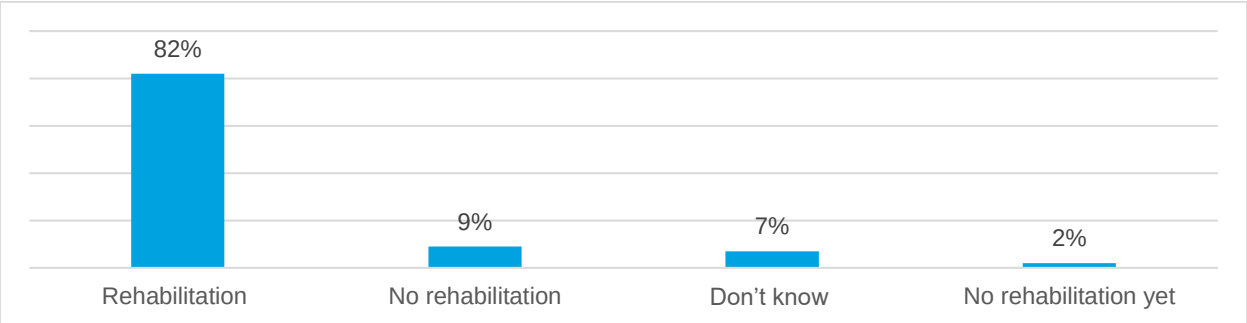


Figure 4-12. Actions taken to rehabilitate the extraction site (n=371)

It was revealed in the KIIs with soum environmental inspectors that rehabilitation efforts are usually organized by local governments in cooperation with international projects and organizations. For instance, environmental rehabilitation activities funded by the Asia Foundation were carried out at one ASM mine site in Uyench soum, Khovd aimag and two sites in Altai.

Findings from the KIIs reveal that a working group led by the soum governor monitors the implementation of rehabilitation plans of their respective soum in Khovd aimag. The working group consists of a state environmental inspector, a ranger from the Great Gobi Strictly Protected Area, a land officer and a deputy governor. The purpose of this working group is to monitor the operation of formal artisanal and small-scale mining within the framework of the law (KII, 2020). The local miners in Khovd aimag mentioned that rehabilitation plans are developed by each partnership and incorporated into their mineral's extraction agreements made with the local governments.

As per the ASM Regulation 151, ASM organizations are obliged to deposit a certain amount of money in the local ASM environmental rehabilitation mutual fund[20] as a rehabilitation bond. However, local governments are unable to create mutual funds in part due to contradicting Mongolian laws, specifically the Budget Law, which dictates that only two local funds can exist – a local development fund and a soum development fund. The miners are then forced to contribute to one of these two funds. For instance, miners in Khovd aimag deposited 1 million MNT per hectare in the local development fund in 2019 (KII, 2020). However, this information was not available from the other study areas. The study also found that despite ASM partnerships contributing to the fund for rehabilitation purposes, there is difficulty in withdrawing from these funds later on as their deposit may have already been prematurely withdrawn and reallocated to fund other community priorities (KII, 2020).

4.2.2 Waste Management Practices of Mining Operations

In terms of abandoned material left at old mining sites, oftentimes miners will collect previously abandoned low grade ore and even tailings material. Two common reasons why this is done is because high grade material has been depleted, in which case miners are forced to process lower grade material at higher volumes to produce the same amount of gold. Secondly, better technologies may have become available, enabling miners to process lower grade material profitably by essentially lowering the cut-off grade.

Regarding general waste, mining operations tend to generate high volumes of organic (e.g., wood waste) and inorganic waste (e.g., plastic and paper waste) and to a lesser extent,

[20] A mutual rehabilitation fund is a fund where ASM partnerships are obliged to deposit funds to be used for later rehabilitation actions once mining has terminated within their concession.

small amounts of chemical and hazardous waste (e.g., machine oil, batteries, and reagents).

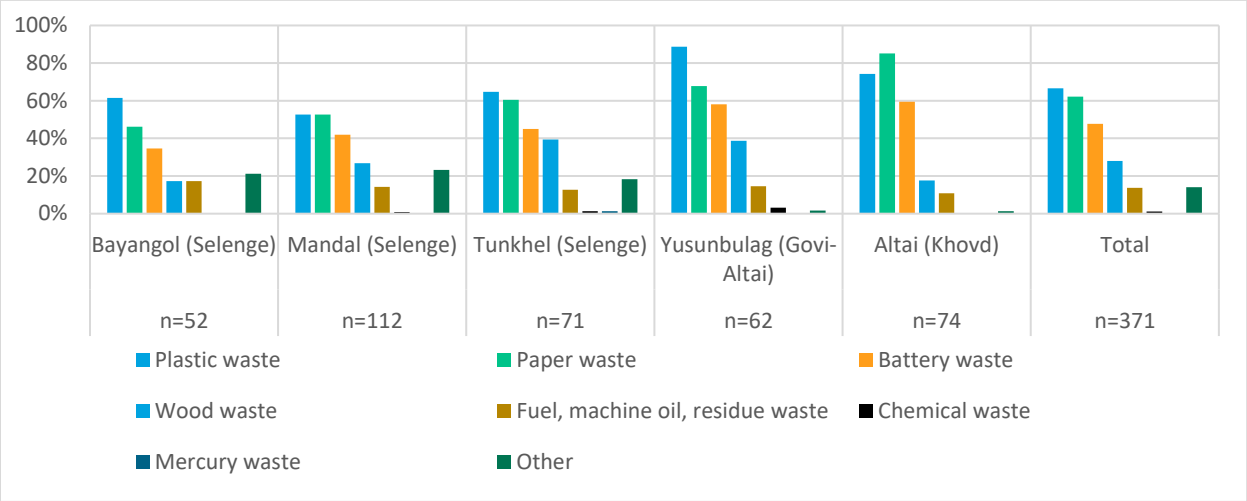


Figure 4-13. Types of waste generated at mine site

It should be noted that sensitive waste streams – namely chemicals such as machine fluids and gold processing reagents like mercury and nitric acid – are probably not accurately reflected in the data as miners were likely to have omitted mention of these substances for fear of being reprimanded for improper disposal practices.

In terms of most common waste disposal practices, the most common practices are burning (43%), burying (38%) and transportation of waste to a landfill (35%). Looking at the study areas, 62% miners in Tunkhel and 53% of miners in Mandal chose to transport their waste to landfills for disposal, 60% of miners in Yusunbulag and 74% of miners in Altai burn their waste, while 38% of miners in Bayangol bury their waste. These practices are especially environmentally damaging if applied to non-degradable and chemical materials such as machine oil, batteries and gold extraction reagents.

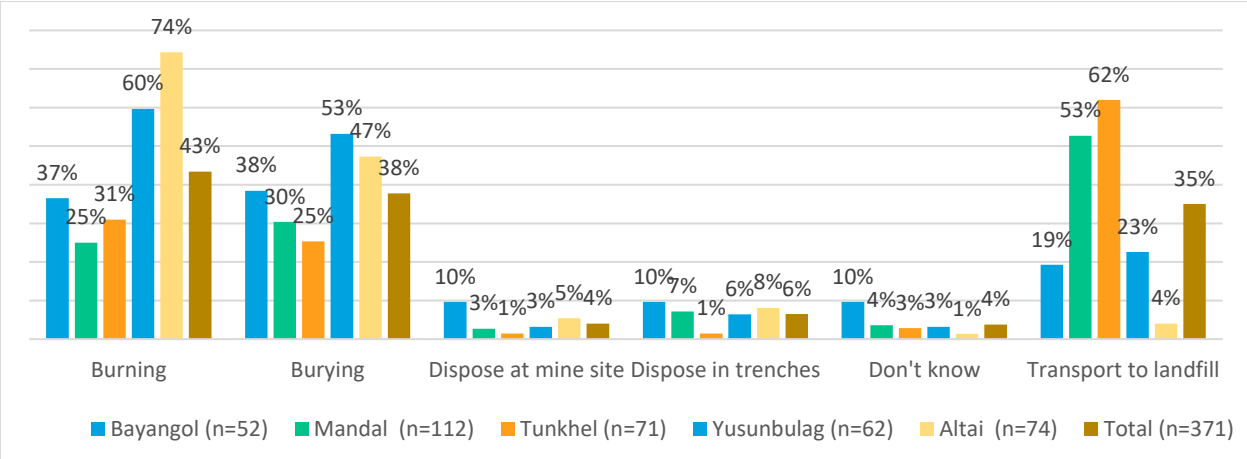


Figure 4-14. Types of waste disposal practices identified by respondents (multiple answers recorded; total=494)

4.2.3 Water Source of Mining Sites and Processing Plants

Water used by miners is derived most commonly from groundwater wells as acknowledged by 59% of the total respondents; miners in Bayangol, Mandal, and Tunkhel relied most heavily on groundwater sources. Exceptions to the rule include Yusunbulag where 66% of respondents indicated nearby rivers and ponds as their water source, while 65% of miners in Altai indicated that process water was trucked to site. The basic reasons regarding water source in Altai and Yusunbulag are related to lack of finance and ASM development, as mentioned by the ASM male partnership leader in Altai (KII, 2020).

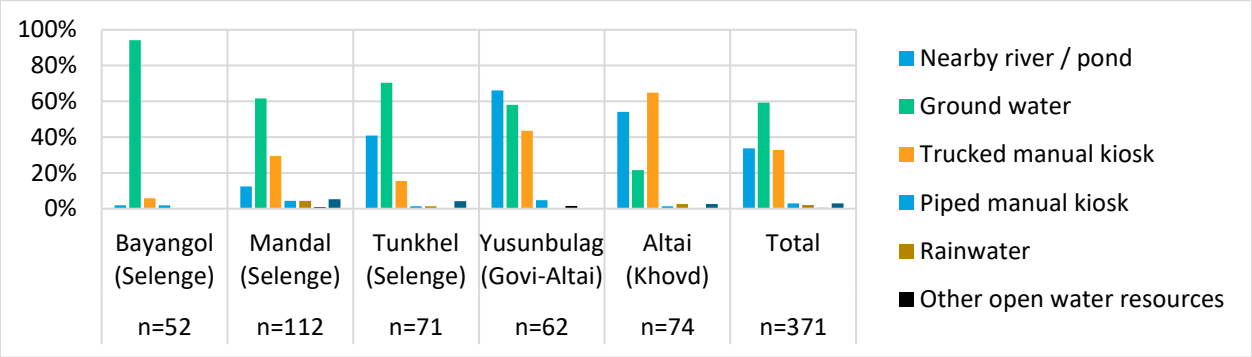


Figure 4-15. Water sources used at the mine sites

Regards to water sources for processing plant, limited data was collected from the KIIs with processing plant owners in the study area because most of the respondents avoided mention of water sources as they operated without the proper environmental permits. Only one respondent mentioned that water is sourced from an adjacent brick making factory (KII, 2020).

4.2.4 Tailings Management Practices at Processing Plants

Mine waste, or tailings, are most commonly stored in the open-air ponds adjacent to processing facilities. These ponds are usually bordered by earthen or sometimes concrete berms where the slurry is allowed to settle to allow for solid-liquid separation. The clarified water can be recycled back into the processing facility, while sludge remains in the pond at the end of a mining season as a result of the recycling and natural evaporation. It usually takes three months to a year to fill the pond, depending on the pond size and the facility's throughput. When a pond becomes full, a small excavator or front loader is used to extract the material which is stockpiled for downstream processing, usually involving cyanidation. As much as 30 to 40% of the original gold content remains in the tailings which is stored by the processing plant owner until it can be shipped off site for cyanidation as detailed in Section 4.1.

4.2.5 Environmental Monitoring Regulations

Environmental monitoring regulations regarding ASM operations and processing plants differ. Environmental monitoring of ASM operations is regulated by the ASM

Rehabilitation Methodology, while monitoring of processing plants is regulated by the PPROP which is valid for both LSM and ASM operations.

According to the ASM Rehabilitation Methodology, environmental monitoring is defined as the act of evaluating the rehabilitation performance of ASM organizations, focusing on whether the rehabilitated land is safe for humans and wildlife. Performance is measured by whether activities are non-polluting, stable, and able to sustain an agreed upon post-rehabilitation land use.

During one KII, an ASM partnership leader in Gobi-Altai aimag stressed that local governments do not sufficiently monitor rehabilitated areas and this deficiency results in many cases where rehabilitated areas are pillaged by other mining groups (KII, 2020). In Gobi-Altai aimag, local officials reported that illegal gold miners are known to remine old mine workings, with enforcement being challenging as these miners evade officials by working at nighttime.

According to the PPROP (2019), processing plants are required to:

- Pre-define potential negative impacts of the processing plant on human health and environment through an Environmental Impact Assessment and define measures to reduce and eliminate them.
- Reflect comprehensive measures to minimize processing plant operation impact to the environment and prevent negative impact to the atmosphere, water contamination, human, animal and plants in environmental management plan.
- Record processing plant impact on environmental regularly and report on environmental management plan on annual basis and deliver to the State Administrative Central Organization in charge of environment, governors, and professional inspection agencies of respective aimag, soum and district.

4.2.6 Conclusions

It is observed that around two-thirds of the surveyed ASM partnerships in the study areas have rehabilitation plans in place in line with ASM related regulations. Most of the ASM organizations limit their rehabilitation activities to the action of backfilling, which oftentimes is only conducted to prevent ore from being pirated or stolen by opposing mining groups. It is observed that biological rehabilitation such as fertile soil filling and planting trees are not taking place enough at ASGM sites. However, some of the ASM partnerships are not able to implement the rehabilitation plan because the mutual rehabilitation fund, which is deposited to a local fund, is difficult to withdraw when necessary.

The quantitate and qualitative data revealed that waste management is not efficiently implemented at ASM sites, especially in Altai and Yusunbulag. Waste is ordinarily just buried or burned, with no special consideration for non-degradable and chemical waste that is especially damaging for the environment.

Respondents mainly derive process water for their operations from groundwater wells, and to a lesser degree from nearby rivers, ponds and via water trucks. The source of

process water is oftentimes a sensitive topic for process plant operators to discuss as it would expose their ongoing operations to the absence of proper environmental permits.

In terms of waste management by processing facilities, tailings are stored in the nearby open-air ponds which are lined with earthen or sometimes concrete berms to allow for solid-liquid separation. This allows clarified water to be recycled back to the processing plant to reduce water consumption. De-watered solids are excavated from the ponds every three to twelve months and are stockpiled before transport to cyanidation facilities to extract any residual gold in tailings.

4.3 Occupational Health and Safety

Artisanal and small-scale gold miners tend to be highly vulnerable to various occupational health and safety (OHS) threats, especially if the mining operations do not comply with existing regulations. Mining operations that are extracting gold from hard rock deposits are subject to more hazards due to the work in deep, narrow and dark shafts. Especially if the shafts are not adequately secured, and heavy machinery required to crush ore is present. In addition to this, the climate in Mongolia forces miners to spend many hours a day enduring cold weather conditions.

Miners observing OHS protocols by wearing PPE (photo taken by planetGOLD Mongolia)

The vulnerability of miners to OHS hazards is influenced by the use of adequate personal protective equipment (PPE), safety mechanisms to secure shafts and other dangerous sections at the mining site, and the handling of chemicals or blasting materials. The implementation and monitoring of these safety measures is dependent on whether safety procedures have been institutionalized within an artisanal mining organization, for example in the form of a safety and risk mitigation plan.

The absence of a standardized OHS registration system and the lack of reliable statistical data makes it challenging to assess the number of injuries and accidents in the artisanal gold mining sector (ILO, 2016). This is especially true in the informal mining sector as miners might not have received sufficient OHS training and accidents may be underreported due to fear of persecution.

In Mongolia, ASM safety and occupational health issues have been regulated by the Government since 2010. Based on ASM Regulation 308 in 2010, the ASM Safety Rule was approved by the Order 153 of the Chairman of the Minerals Resource Authorities. To improve OHS standards in the ASM sector, the Government approved the ASM Safety Rule in 2017 within the framework of the implementation of the ASM Regulation 151 by the joint decree of the Ministers of MMHI and MLSP (MMHI, MLSP, 2017). With the adoption of these regulations, artisanal and small-scale miners are required to follow the safety instructions when working in open pit and underground mines to prevent accidents at the

mining site, and to comply with occupational health and safety, and equipment requirements.

According to ASM Regulation No. 151, aimag and soum governors are responsible for maintaining ASM data and the submission of reports on ASM status, including the number of accidents in ASM to MPRAM. If there is an accident, the cause must be investigated and registered in accordance with the Regulation on investigation and recording of industrial accidents, occupational diseases and acute poisoning (GoM, 2015) and the soum/district governor must be immediately informed.

4.3.1 Use of Safety Equipment

Working in hard rock mining shafts is especially prone to accidents, as the miners are not always adequately secured or wearing the appropriate PPE. According to the survey respondents, 267 (72%) of the miners surveyed answered that their group does secure miners inside of the shaft (Figure 4-16). This safety procedure was widely in place in Mandal and Tunkhel (91% and 93%), but low in Altai (26%). This may be due to the lack of experience in Altai, where formal ASGM has only recently begun. As shown in Figure 4-17, fastening seems to be more prevalent among formal organizations (ranging from 76% to 85%) than in informal and illegal groups (71% and 47%, respectively).

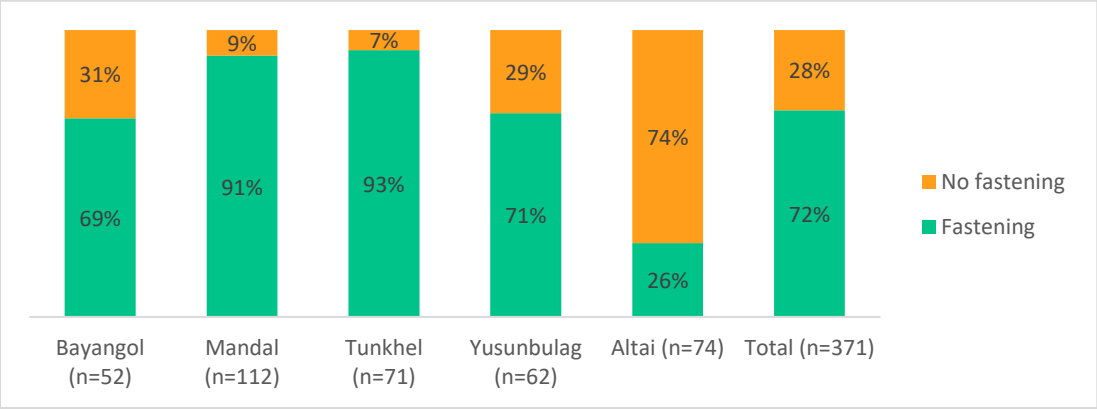


Figure 4-16. Number of respondents whose group do mineshaft entrance fastening, by study area and total

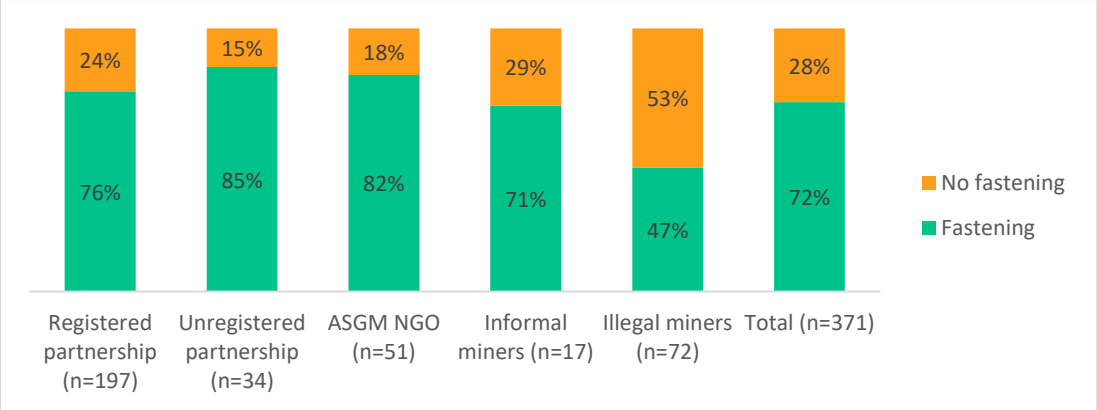


Figure 4-17. Number of respondents whose group do mineshaft entrance fastening, by form of mining organization

According to the ASM Safety Rule, the mine shafts must be secured against landslides and slips. Mine shaft entrances shall be supported by bagged sand, dirt, stone, wood or concrete and fenced and protected with special materials. Warning signs must be placed around the entrance to the shaft, and inside of it. When asked about how the mining group usually secures the mining shaft, most respondents mentioned that they cover the shaft with lumber (60%) or place a shed over the hole (41%) (Figure 4-18). Others also used warning ribbon (39%) and warning signs (44%), whereas 13% explained they do not use any safety measures at all.

Miner operating at a secured shaft in Tunkhel village (photo taken by planetGOLD Mongolia)

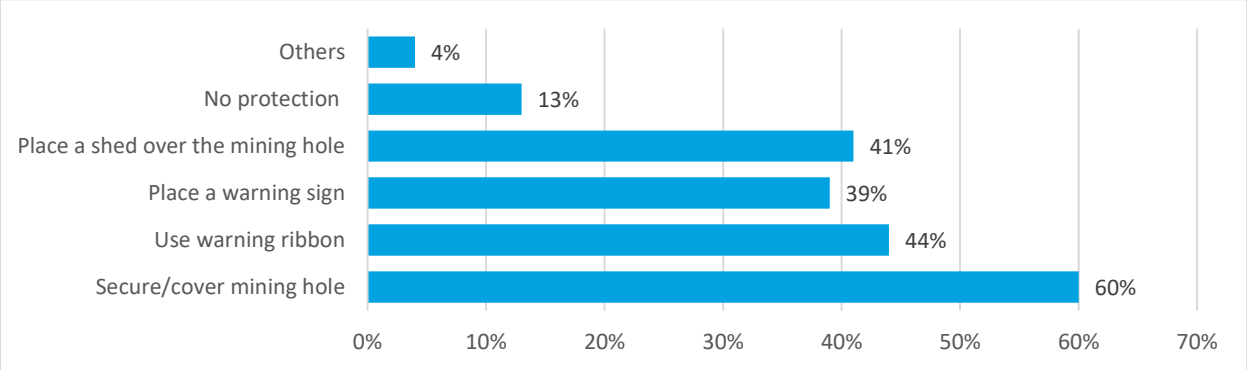


Figure 4-18. Measures named by respondents to secure the mine shaft (n=371; multiple answers possible, total=744)

Different types of PPE are required for all tasks involved in ore extraction and ore processing. Overall, 57% of respondents stated they always use PPE and 22% responded that they sometimes use PPE (Figure 4-19). The regular use of PPE differed between the study areas, ranging from 83% in Tunkhel to 42% in Bayangol, where almost half of the miners (46%) stated that they never use PPE. Taking into consideration the form of organization, use of PPE was most prevalent among ASM organizations (73% always) and the lowest among informal and illegal miners (35% and 33%, respectively) (Figure 4-20).

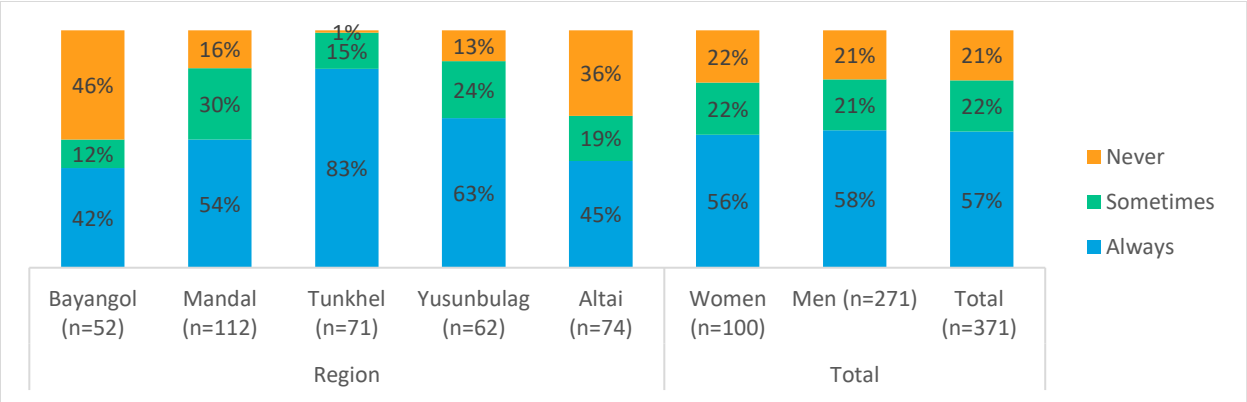


Figure 4-19. Use of PPE by respondents during mining operations, by study area and total

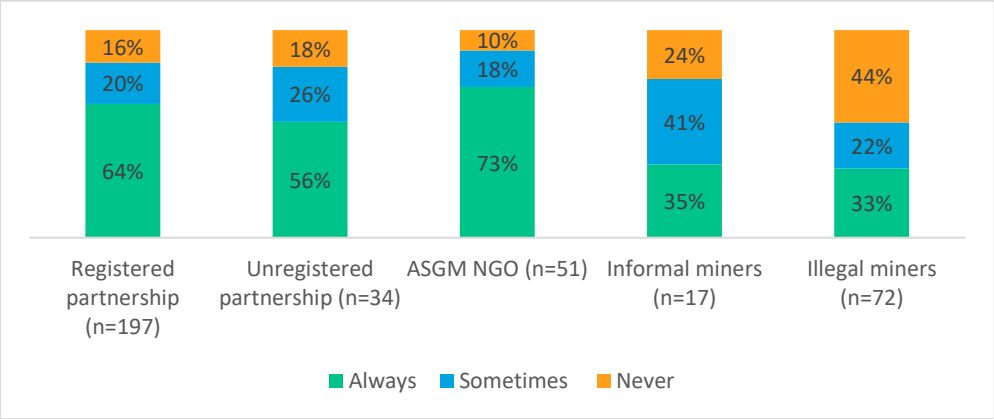


Figure 4-20. Use of PPE by respondents during mining operations, by form of organization

From the 293 miners (79%) who use PPE all the time or sometimes at the mine sites, gloves and helmets are the most frequently used PPE (89% and 85%), followed by masks (58%). While almost half of the miners wear protective suits and shoes to protect their skin and feet, ear and eye protection is the least frequently PPE used by miners. Helmets, gloves, protective shoes and suits are recommended for almost all tasks during ore extraction and processing, while noise protection is mainly required when dealing with loud machinery. However, noise as risk factor is also often underestimated by workers.

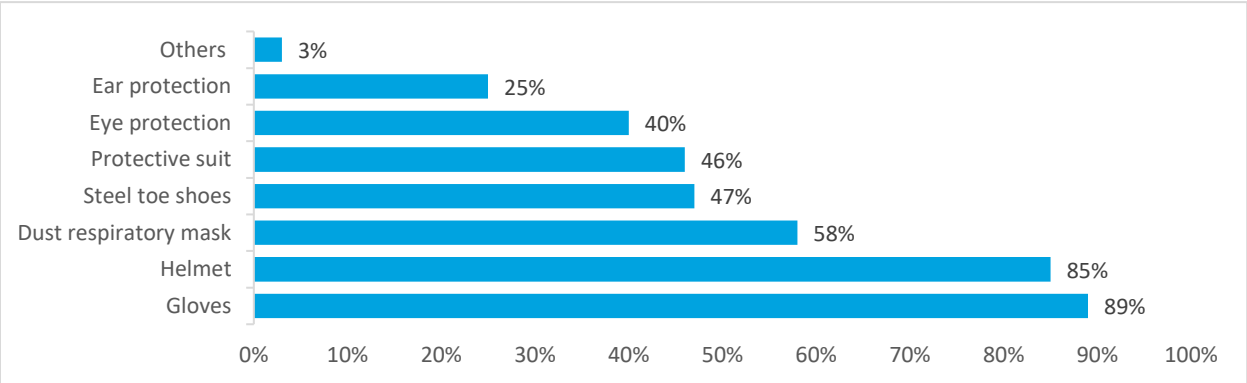


Figure 4-21. Type of PPE used by respondents (n=293; multiple answers recorded, total=1,318)

The majority of the miners had purchased the PPE for themselves (76%). Some respondents had received the PPE from their mining organization (18%), especially in Mandal (29%). A minority of miners (3%) had borrowed the PPE from other miners.

4.3.2 Safety Procedures at the Mine Site

Safety rules and regulations are an important mechanism used to prevent the miners from exposure to hazards, but also to have a plan in place should an emergency arise. For example, the collapse of a shaft, a chemical spill or an injury all require OHS management plans. The ASM Safety Rule includes OHS training for all miners, safety instructions and checks before the performance of specific tasks (e.g., blasting), the development of a safety and risk mitigation plan, as well as the designation of an OHS officer who is in charge of coordinating health and safety systems at the mining site.

Figure 4-22 shows how often safety instructions are given to miners in the study areas before the beginning of mining operations. Overall, 72% of artisanal miners are regularly provided with safety instructions, ranging from 99% in Tunkhel to 34% in Altai.

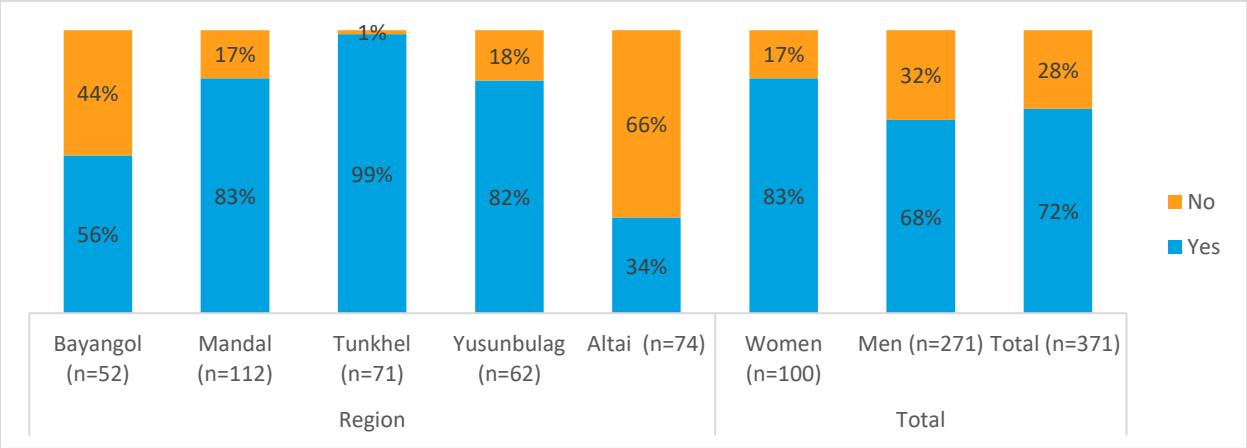


Figure 4-22. Respondents who receive safety instructions before mining operations, by study area, gender and total

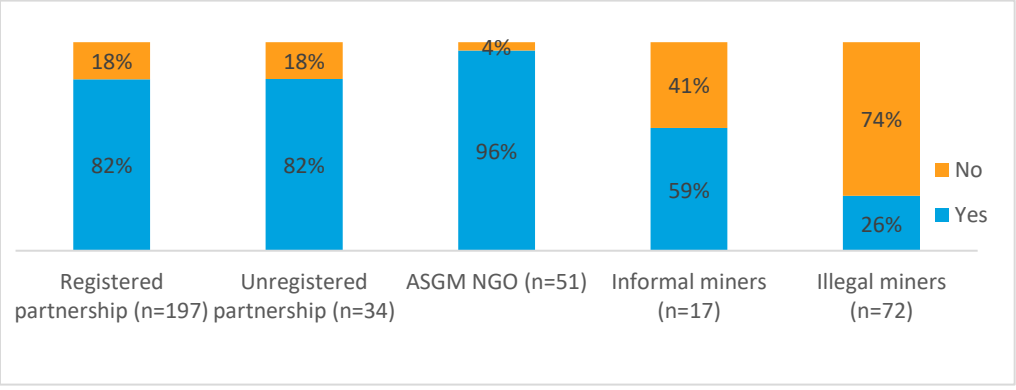


Figure 4-23. Respondents who receive safety instructions before mining operations, by form of organization

When looking at the data by organization type the respondents belonged to, ASM organizations had the highest number of miners who received safety instructions before the commencement of mining operations (96%), whereas illegal miners received safety instructions at a much lower rate (26%). Asked how often the respondents received these safety instructions per month, around half (52%) answered that they receive these instructions on a daily basis, whereas 11% only receive instructions once or twice per month. The content and quality of the safety instructions was not assessed.

When asked if the mining organization of the respondent has safety procedures and a risk mitigation plan in place, more than half of the respondents (54%) answered yes (Figure 4-24). Tunkhel, which was the area with the highest number of miners receiving safety instructions (Figure 4-22), was also the area where most groups have a work safety plan in place (65%). Compliance was again the lowest in Altai (27%). Figure 4.25 shows a clear gradient between organized, informal, and illegal miners.

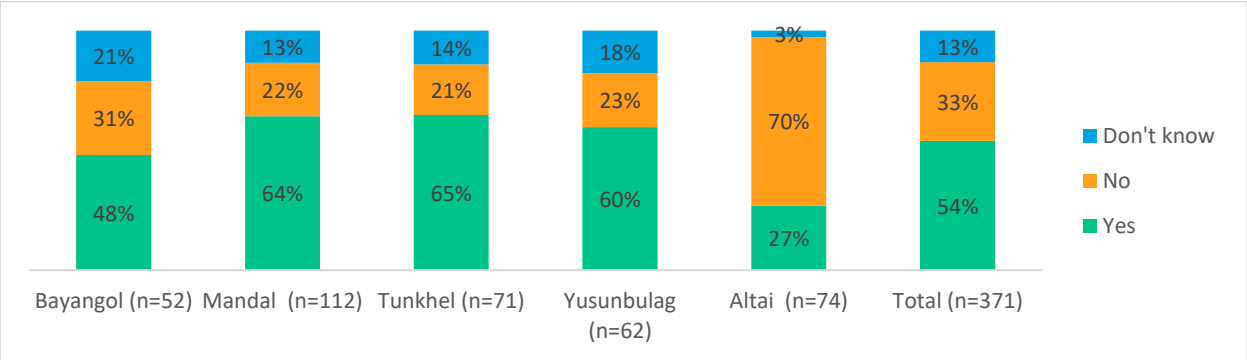


Figure 4-24. Number of respondents who reported a risk mitigation/work safety plan at their mine site, by study area and total

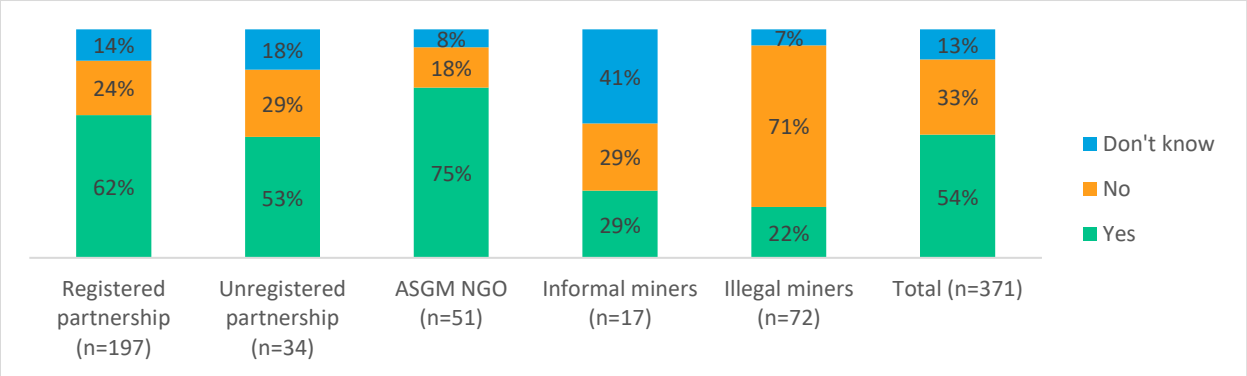


Figure 4-25. Number of respondents who reported a risk mitigation/work safety plan at their mine site, by form of organization

According to the ASM Safety Rule, the partnership leader is responsible for the safety of its miners and health conditions at work. The presence of a dedicated partnership leader or OHS officer who is responsible for maintaining the ASM Safety Rule at a mining site is an important prerequisite for the planning, implementation, monitoring and revision of health and safety protocols. This also includes monitoring the compliance of miners following OHS protocols. A total of 53% (Figure 4-26) of the respondents reported that they

had a safety officer at the mine site, ranging from 79% in Tunkhel and Yusunbulag to only 19% in Altai. This may indicate a knowledge and experience gap in Altai. In Bayangol, only 27% of respondents answered that they did have a safety officer at the mine site, as there is currently no permitted land in the soum. Compliance was higher amongst organized miners and highest amongst ASM organizations (84%), but far below average among informal and illegal miners (12% and 22%, respectively).

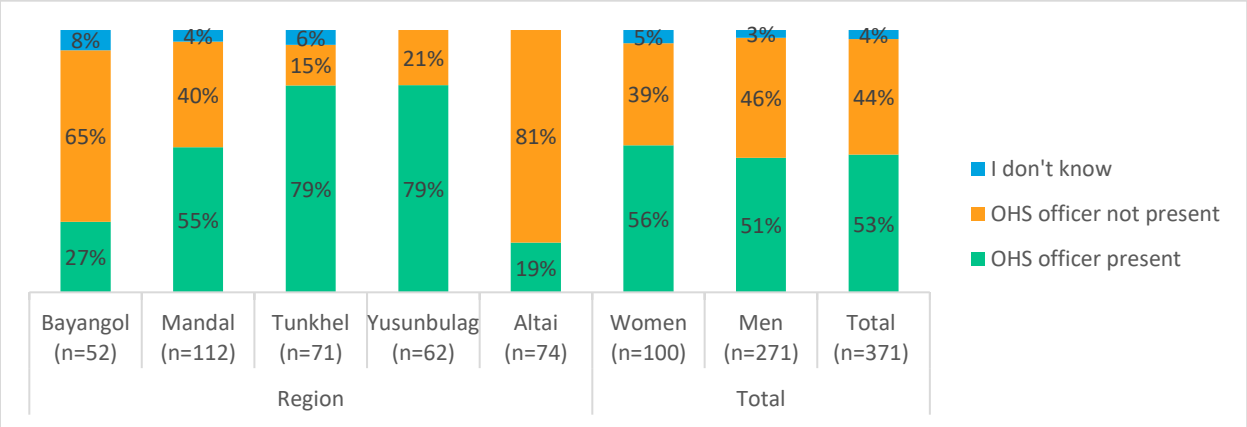


Figure 4-26. Respondents who reported that the mining site has an OHS officer, by study area, gender and total

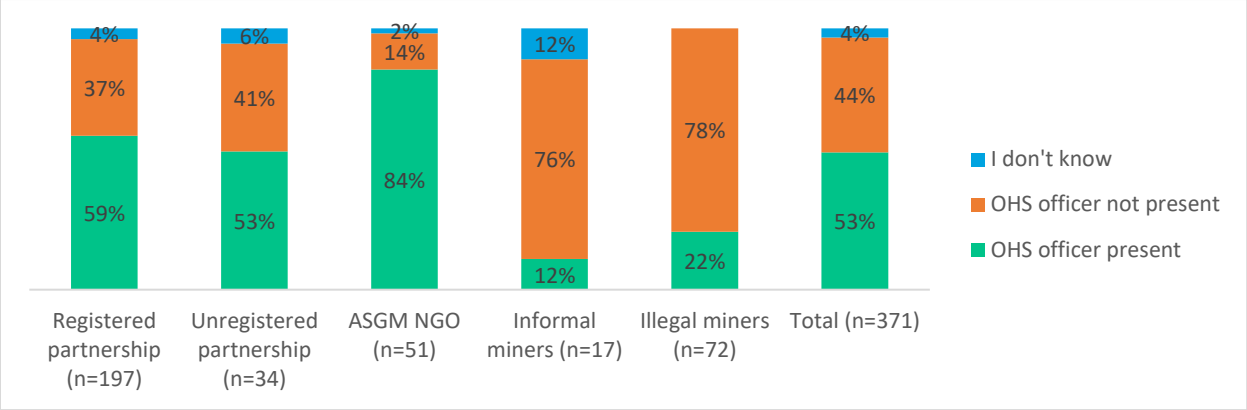


Figure 4-27. Respondents who reported that the mining site has an OHS officer, by type of organization

One aspect of a safety plan at a mining site is the use of warning signs and boards, especially those used to mark hazardous areas such as shafts or storage of dangerous materials such as chemicals and explosives. Around one quarter of the respondents (28%) revealed that they do not use any signage to mark off dangerous areas at their mine site, whereas others use signs (22%), boards (18%), ribbons (16%) and other materials. Figure 4-28 shows that the use of safety signs is less prevalent among informal and illegal miners, with compliance being the highest among ASM organizations.

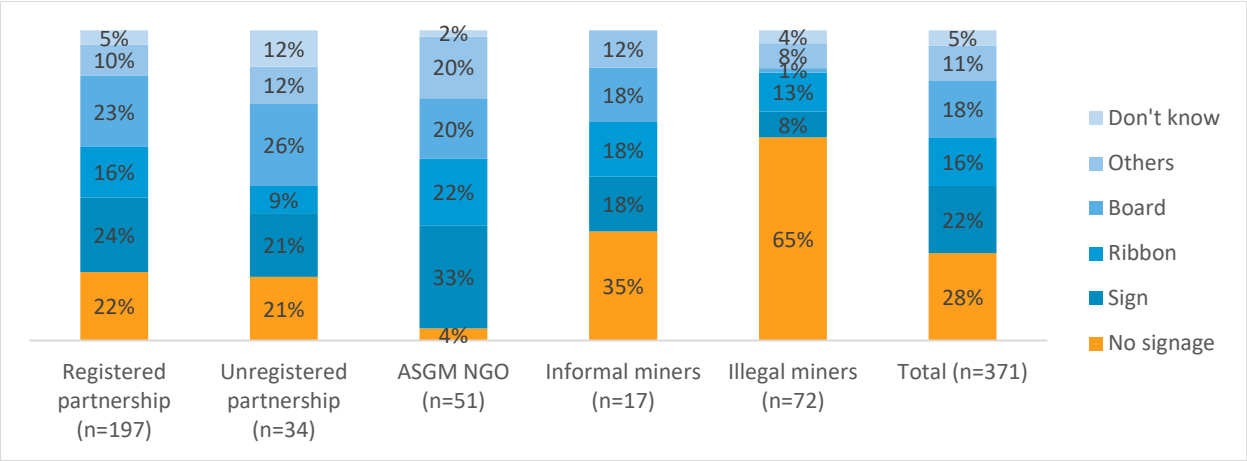


Figure 4-28. Use of safety warning signs at the mine site, by type of organization

It is an important skill for miners to have the knowledge, awareness and attitude to identify potential hazards and prevent risks at the mine site. During the survey, respondents were asked whether they had observed any safety risks at their shaft. This question does not provide insights about the ability of miners to observe risks, or the presence of all risks due to the reasons outlined above. As shown in Figure 4-29, 30% of all respondents answered that they had observed risks at their shaft.

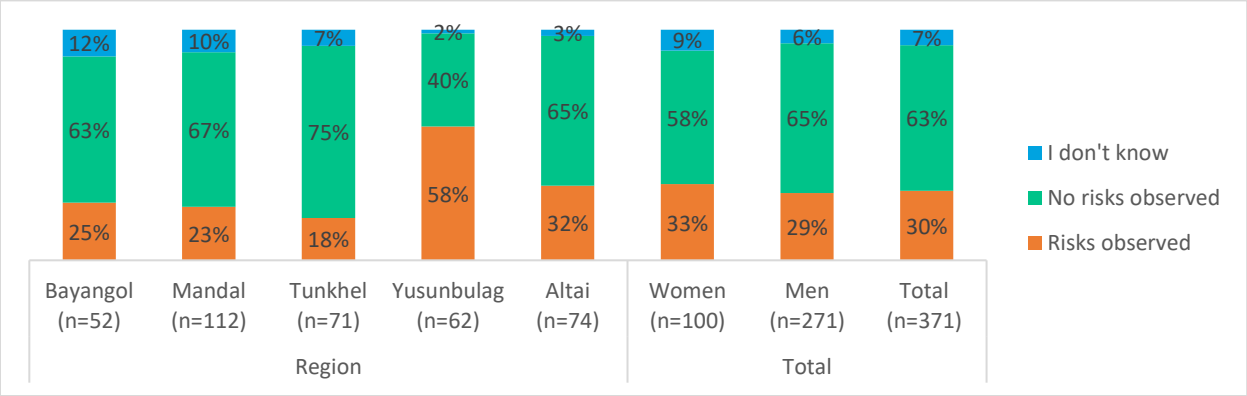


Figure 4-29. Respondents who have observed any mining safety risks in their shaft, by study area, gender and total

From those 112 miners who had identified a risk, most named rockslides, and cave-ins as major risks (59%), whereas 7% mentioned weak harnesses. Others made more general statements regarding risky work environments (13%), but also mentioned alcohol as a risk

factor at the workplace (2%).

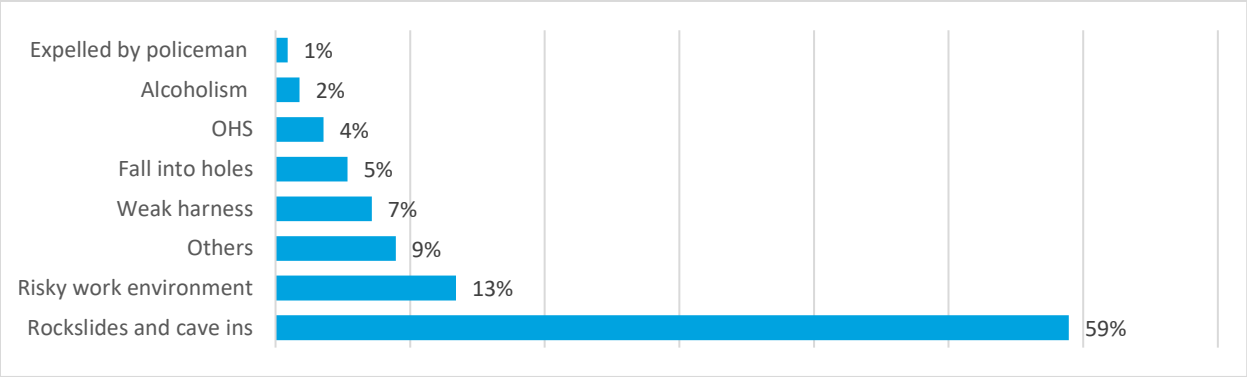


Figure 4-30. Safety risks at the shaft, reported by respondents (n=112)

4.3.3 Capacity Building on OHS

As shown in Figure 4-31 below, 59% of all respondents have participated in an OHS training, ranging from 81% in Yusunbulag to 38% in Altai. The scope and content of the training was not assessed. Considering that only 11% of respondents indicated that they had received health-related training in the past two years (Chapter 8), there can be an assumption made that the data has been overreported or that the miners also reported smaller training units such as safety instructions at the mining site.

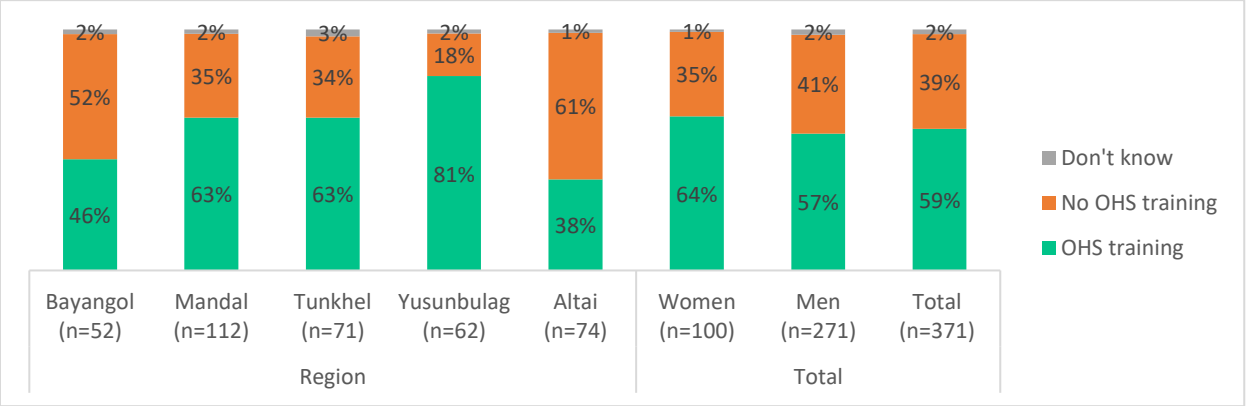


Figure 4-31. Respondents who have ever participated in Occupational Health and Safety training, by study area, gender and total

Asked whether respondents follow OHS standards at the mine site, almost all respondents said that they would either strictly follow (58%) or try to follow (36%) the standards (Figure 4-32). However, only 61% of those respondents self-reported their participation in an OHS training, indicating that either the data is overreported due to social expectancy bias, or that miners referred only to specific aspects of an OHS protocol, such as wearing a helmet, and not a comprehensive OHS protocol. This explanation is also in line with the high need of OHS training identified through KII interviews with key stakeholders (Chapter 8).

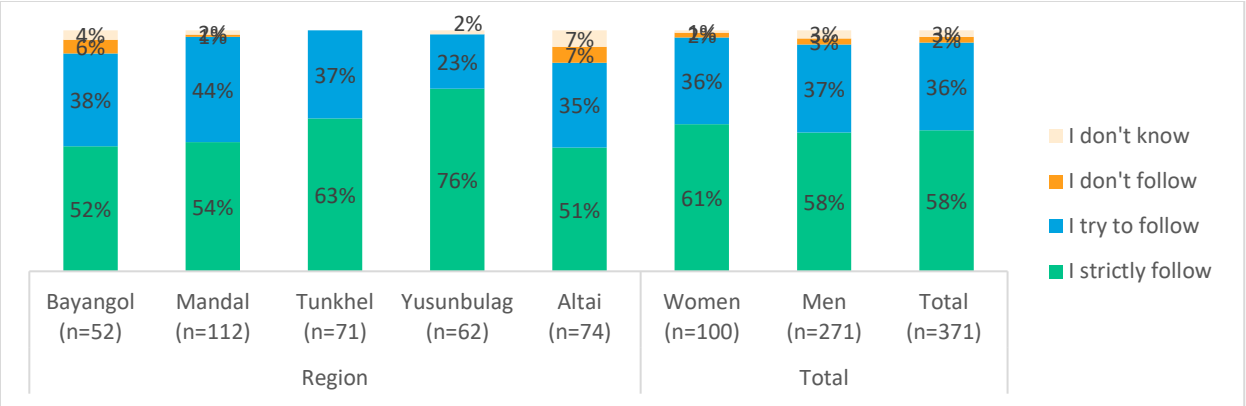


Figure 4-32. Respondents' self-assessment how well they follow OHS standards at the mining site, by study area, gender and total

However, the findings tend to confirm regional differences, with higher OHS compliance in Yusunbulag and Tunkhel, and lower compliance in Altai. Interestingly, while women were more likely to have received OHS training (7%), compliance with OHS standards was only marginally higher (3% among those who strictly follow them).

4.3.4 Conclusions

Section 4.1 of the report showed that ASGM operations in hard rock gold mining are mostly performed by manual labor and that miners want to use blasting and upgraded equipment. Although serious accidents are not reported to have occurred in hard rock ASGM, the work remains hazardous and compliance with occupational health and safety standards is vital. Lack of a clear understanding of occupational safety, lack of use of safety PPE and devices, and failure to conduct risk assessments in the shafts and mine site area increase the risk of injury and death. Blasting at hard rock deposits should be carried out by a licensed company, but due to financial constraints it is being carried out in secret. This creates an increased risk of workplace accidents involving rockslides and shafts collapsing. During a KII interview, a miner from Selenge aimag stated that there was a slight injury due to blasting at mining sites.

This chapter shows a mixed picture of the compliance of artisanal miners with existing OHS rules, with differences between study areas and the form of organization. In total, the number of miners who indicated that their group secures miners within shafts (72%) and always wears PPE (79%) at the mine site was moderately high. However, compliance was higher in Tunkhel and the lowest in Altai, while being noticeably higher amongst registered organizations and lowest amongst illegal miners.

The number of respondents who reported that their group has safety procedures in place was lower: 54% of respondents reported having a safety plan in place and 53% to having a dedicated OHS officer. Both procedures are important to efficiently implement and monitor OHS measures at the mining site. A regional analysis reveals that safety procedures seem to be more often in place in Tunkhel and less often in Altai. Illegal miners showed again the lowest compliance, also in simpler procedures such as marking hazardous areas at the mining site (only stated by 35%).

In terms of existing capacity to follow safety rules, 59% of respondents reported having received OHS training, though the scope of the training was not assessed, and only 58% of miners indicated that they follow OHS rules strictly. Assessing OHS compliance bears certain challenges since survey respondents are likely to overreport compliance because of a social expectancy bias. It was not possible to observe compliance in the field to verify findings from the survey (see Section 1-4).

Overall, the findings indicate that more capacity building on OHS is required, which does not only address the different safety measures such as securing hazardous sites, but also how to determine OHS risks, develop and implement an OHS plan successfully at the mining site. The findings also indicate that OHS trainings and information is generally higher with organized miners. This is a validation of the positive aspect of formalizing the sector.

5. Mercury Use

Mercury is a permanent pollutant that is not degradable and has significant adverse effects on human health and the environment (AGC, 2020). The ASGM sector is the largest source of global anthropogenic elemental mercury emissions (UNEP, 2019). Artisanal miners tend to use mercury in gold extraction as it is economically cheap and simple to use, although its recovery only ranges from 20 to 50%. While mercury use is part of mining practices (Chapter 4), it is treated as a stand-alone chapter due to its importance. The National Action Plan (NAP) (Government of Mongolia, 2020) summarizes the various studies on mercury use in ASGM in Mongolia, concluding that mercury has been used widely in Mongolia and continues to be used among artisanal miners, despite its ban in 2008. In addition, as stated by the NAP, mercury use might increase in the future as reserves of placer gold deposits, that are typically not treated with mercury, continue to decline. This might push miners into hard rock mining, where mercury is used to separate gold from the ore, and increase the prevalence of mercury amalgamation practices, especially in illegal or poorly controlled settings.

Sponge gold is the product of the gold and mercury amalgamation process (Photo taken by Today Newspaper Mongolia)

This chapter provides a brief overview of the legal frameworks on mercury use, mercury use estimates for the five study areas (two sites are targeted for the installation of mercury-free processing facilities by the planetGOLD Mongolia project), and knowledge of miners on the health effects of mercury use.

5.1 Interventions by the Government of Mongolia to Address Mercury Use

The Law on Hazardous and Toxic Chemicals, amended by the Mongolian Parliament in 2006, regulates all aspects concerning the export, import and transport of toxic chemicals across the borders of Mongolia and its production, storage, trade, use, removal and control. According to this law, the State Administrative Central Organization in charge of environment shall exercise all powers upon coordination of activities related to hazardous and toxic chemicals. In addition, Order 135, issued by the Minister of Environment in 2008, prohibits the use of mercury in gold ore processing. Also, in 2009 the implementing rules and procedures known as “Procedure(s) for Export, Import, Transboundary Movement, Production and Trade of Toxic and Hazardous Chemicals” was approved under the joint order of the Ministers of Environment and Foreign Affairs, serving as a mechanism to control the regulation of the export, import, transboundary movement, production, and trade of mercury containing compounds. In 2011, use of mercury and its organic and non-organic compounds was included in the list of chemicals restricted within Mongolian territory, and approved by Government Resolution 176.

Authorities adopted a zero-mercury policy in 2008 and the use of mercury in mineral processing was formally banned. A public information campaign promoting residents to report illegal chemicals (cyanide[21] and mercury) storage and usage was conducted pursuant to the ban (UNIDO, 2017). In the same year, national authorities mobilized efforts to remediate several contaminated sites polluted by illegal use of hazardous chemicals and over 300 kg of mercury were collected under this initiative (Government of Mongolia, 2020).

In terms of mercury control in mineral processing facilities, in 2007, a working group consisting of representatives from the Specialized Inspection Agency (SIA), the Ministry of Environment, the Ministry of Industry and Trade, the National Emergency Management Agency (NEMA) and the State Investigation Department (SID) began monitoring the use and storage of hazardous and toxic chemicals of all organizations, individuals and institutions conducting mining activity in Mongolia. As a result, 147 pan mills that use mercury for gold extraction were seized and decommissioned. Currently, sluices and shaking tables are used as a mercury-free alternative technology for gold extraction. However, affordable and high-capacity shaking tables are rare, and are not readily available (miners have difficulties in purchasing them). The cheap shaking tables that are available on the market, usually made in China, are not preferred by miners due to questionable quality leading to subpar gold recoveries and high maintenance costs (Government Mongolia, 2020). There are currently only two permitted mercury-free processing plants in Mongolia, namely in Bayan-Ovoo soum of Bayankhongor and Khankhongor soum of Umnugobi aimag.

On October 10, 2013, Mongolia joined the Minamata Convention on Mercury and ratified it on April 30, 2015. In 2019, the Government approved the “National Action Plan for Reducing Mercury Pollution caused by ASGM in Mongolia” (NAP) through Resolution No. 317. The NAP follows Annex C of the Minamata Convention outlining mercury-use elimination targets, among others, including a compilation of strategies for mercury mitigation in the sector, underpinned by a formal baseline of mercury use determined by field observation, physical measurement, interviews, and validated by a diverse group of national stakeholders (Government of Mongolia, 2020).

5.2 Estimation of Mercury use

Estimates of National Mercury Use

A national mercury emissions inventory was developed in 2011 by the Ministry of Nature Environment and Tourism (MNET) in cooperation with the United Nations Institute for Training and Research (UNITAR) with financial support from the US Environmental Protection Agency (US EPA). The inventory was part of the Minamata Initial Assessment (MIA) for the Minamata Convention and it accounted for all sources of mercury emissions and releases, including a course overview of that used by artisanal gold mining. The

[21] Cyanide is in the list of severely restricted chemicals, which was approved by the Resolution #95 of Government of Mongolia (Government of Mongolia, 2007)

inventory was based on the United Nations Environmental Programme (UNEP) toolkit for identification and quantification of mercury releases (O'Neill & Telmer, 2017). The results of the MIA inventory served as a background document for the creation of a national mercury risk management plan prepared by the Ministry also in 2011, in coordination with UNITAR and US EPA. Annual mercury releases in Mongolia were estimated at 548.4 tonnes, with gold extraction identified as the largest contributor to national mercury emissions (MNET, 2011).

Throughout 2018-2019, an inventory of mercury consumption specifically of the ASGM sector was coordinated by Ministry of Environment and Tourism (MET formerly MNET). Recent research was conducted in 2019, by MET with the technical assistance of UNEP and the Global Environment Facility (GEF) to assist in the development of a 'National Action Plan for Reducing Mercury Pollution Caused by Artisanal and Small-scale Gold Mining in Mongolia'. The NAP project team estimated the likely mercury use in ASGM based on the number of active placer and hard rock deposits, and the average amount of gold extracted and processed (Government of Mongolia, 2020). Table 5.2-1 shows the contingent use of mercury in ASGM as estimated by the NAP team in the study aimags and soums.

Table 5.2-1. Mercury estimates in study areas (if available) from the Mongolia NAP (Government of Mongolia, 2020)

Selenge aimag (total)	120.08 kg
Mandal	8.424 kg
Tunkhel	40.053 kg
Bayangol	39.143 kg
Gobi-Altai aimag (total)	23.4 kg
Khovd aimag (total)	20.28 kg
National Total	**235.413 kg**

These estimates are based on the assumption that mercury is applied to gravimetric middlings material to extract gold from gangue material. The estimation of likely mercury use at national, regional and local levels was estimated using the global average for mercury used to gold ratio "1.3:1" (O'Neill & Telmer, 2017). For this estimation purpose, sites with hard rock deposits were considered as the sites with potential use of mercury in ASGM (Government of Mongolia, 2020).

Reported Mercury Use in the Study Areas

Since mercury use in ASGM is illegal in Mongolia and can be punished with imprisonment, only two questions were included in the survey that asked directly about mercury use. These questions were asked at the aimag level, to avoid creating a perception of the project as part of a prosecutorial exercise to gather data and to encourage honest responses. In the first question, miners were asked whether they have seen mercury being used for gold extraction in the last two years in their aimag. According to the survey, only 15% of the respondents answered that they have witnessed the use of mercury in the last two years within their province, whereas 82% negated it and 3% chose not to answer the question. As shown in Figure 5-1, mercury use was more often reported in Bayangol (25%) and Altai (26%). Looking at the reporting behaviour in relation to the form of mining organization (Figure 5-2), respondents of informal groups reported more often the observation of mercury use (29%), than respondents from unregistered partnerships (6%) or mining NGOs (12%). Although the results are likely an underestimation of the frequency of observation of mercury use due to fear of prosecution, the data shows that mercury has still been in use in all three aimags within the last two years.

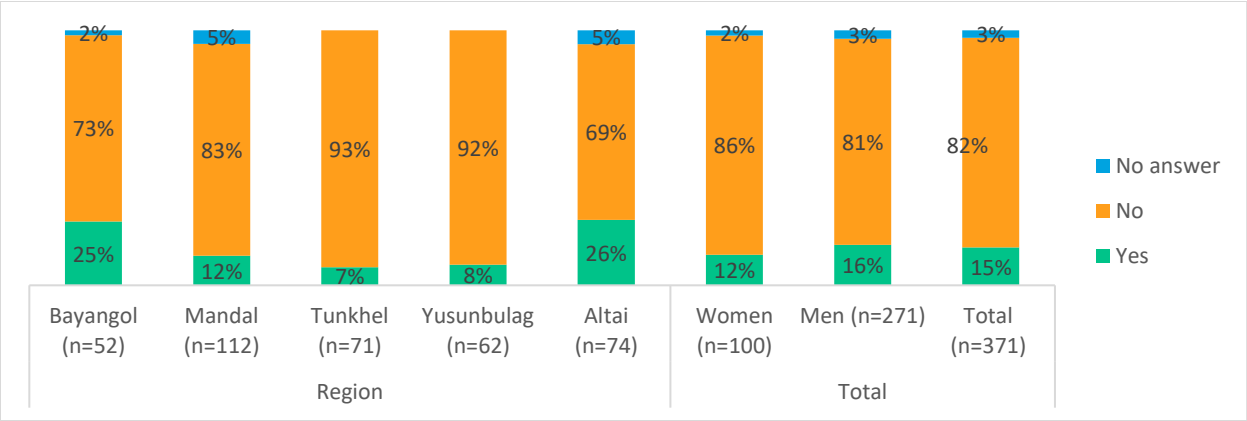


Figure 5-1. Mercury use observed by respondents during the last two years at the aimag level, by study area, gender and total

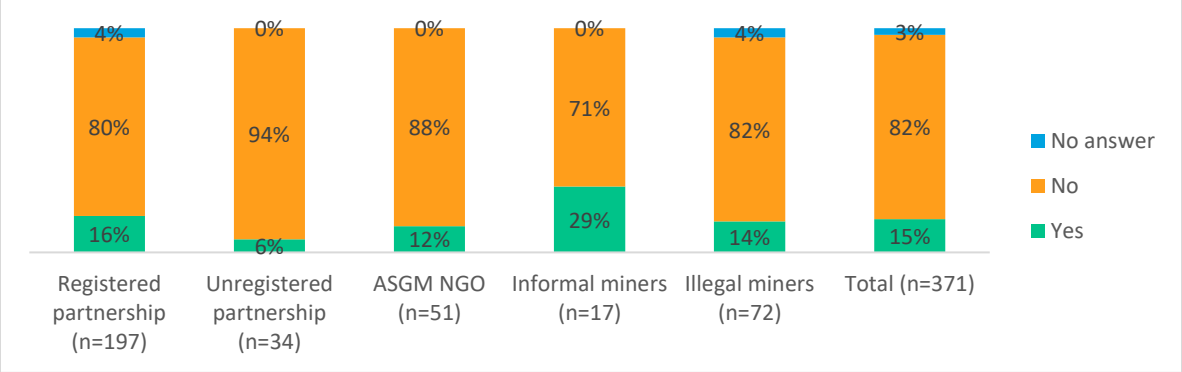


Figure 5-2. Mercury use observed by respondents during the last two years at the aimag level, by form of organization

In the second question, respondents were asked whether they were aware of any mercury being sold in their aimag. The majority of the respondents (91%) answered no and only 8% admitted that they were aware of mercury trade within the aimag. The reporting behaviour according to gender did not differ, with a slightly higher reporting rate of mercury trade among women (10%) than men (7%). Figure 5-3 shows the reporting behaviour according to study area; this time with higher reporting rates in Mandal and Yusunbulag (11%, both sites).

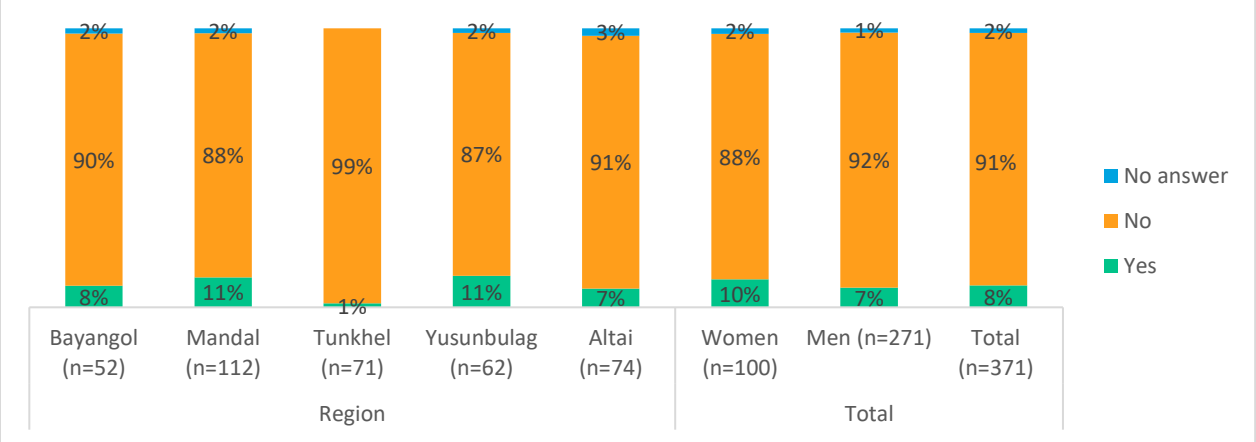


Figure 5-3. Awareness of mercury being sold within the respective aimag, by study area, gender and total

The estimates from the NAP project team confirm mercury use in the three aimags of the study, and more specifically in the three study areas in Selenge aimag (Bayangol, Mandal, and Tunkhel) (Section 5.2). During in-depth interviews with the leaders of mining organizations in the study areas, a partnership leader acknowledged that mercury is widely used in Altai. However, he emphasised that his partnership is a legally registered entity that is not using mercury:

> *Mercury is widely used in our Western soum. It must be brought in through the southern borders. I've heard there are mercury traders who sell mercury. As such trade is strictly punished by the law, people, use it very secretly. Despite this people [sic] use mercury to separate gold from other materials hence the process is based on trust when no one reports each other. As for our partnership we are a legally registered entity thus we are unable to use mercury.*
>
> **KII, male partnership leader, Khovd aimag**

A partnership leader in Gobi-Altai aimag claimed that her partnership is using mercury-free processing practices:

> *No, we've never used mercury. We recover gold in mills. At the gold dealers, we melt the gold ourselves and then weigh it. Hence, we do not need to use mercury.*
>
> **KII, female partnership leader, Gobi-Altai aimag**

Some of the local government officials and other key stakeholders also explicitly stated that mercury is being used in their respective soums:

> *There is no formal database on mercury usage, and it is hidden. In fact, there are cases of mercury usage in the past 12 months. Communities have collected mercury from a spill at Boroo river basin.*
>
> **KII, male officer, Selenge aimag**

> *When I buy gold, I don't ask how it was processed, I just buy the gold I was given. About a month ago, I bought about 3 grams of gold which was extracted with mercury. 30-40 grams of total gold is in this form (sponge).*
>
> **KII, gold trader, Selenge aimag**

> *Mercury may be used in processing mills to concentrate gold. Therefore, I think the use of mercury can be stopped by stopping its operation and sealing it. In our aimag, 1 incident of mercury spill is recorded and decontamination and neutralization are carried out at the incident site.*

KII, officer, Gobi-Altai aimag

Local officials also stated in the KII that there are currently no specific activities on mercury reduction included in local planning. A local official from Mandal also emphasised the need for the formalization of the sector, since a push into illegality would also push miners towards mercury use.

Estimated Mercury Use in the Study Areas

For the survey, the average probability of mercury consumption in the study areas was calculated using the same estimation method as in the NAP Comprehensive Study (Government of Mongolia, 2020; O'Neill & Telmer, 2017). While the NAP team based its estimates on secondary production data from the aimag and soum governors, the project aimed at collecting primary data directly in the field. Primary data on volumes of ore extraction, gold production, ore grade and ore purity were collected from miners in the five study areas. In addition, the objective was to extrapolate the volume of middlings based on principles of mass balance, since mercury use is more likely on this ore stream, especially if miners process this material privately. However, this also depends on whether this is permitted by the processing facility. Due to the various influencing factors and limitations discussed below, it was not possible to come up with estimates in the study areas that fulfill all reliability standards. Hence, the project decided to rely on the estimates produced by the NAP team for now and will continue to work on and improve estimates in the areas during the course of the project.

In addition, the following challenges were identified by the planetGOLD Mongolia team:

- **Identification of the target group**: Based on the knowledge gained through the project, mercury is mainly being used if miners process middlings privately. Hence, the total volume of processed ore is not a reliable variable as this would imply the practice of whole ore amalgamation which is highly unlikely due to the high amount of mercury this method would require. Methods need to be developed to capture the number of miners using mercury (identification of target population) and the volume of ore they process.
- While the volume of ore extraction and processing of a mining site can be assessed during field work, this still does not take into account the problem that only few miners do actually process middlings with mercury.
- **Accuracy of primary data**: Basing mercury use estimates on technical data provided by the miners is problematic as the miners do not track processing data at all or not with a high degree of accuracy. This is because the miners keep poor records of important processing parameters which are used to calculate mercury estimates (Section 7.3). For example, the total volume of ore processed is not tracked as closely as the total amount of gold produced and sold.
- **Lack of data**: Miners attempt to determine gold recoveries based on perceived knowledge stemming from past processing experience; and they rely on lesser methods of determining gold purity, such as the water density method, as it is uneconomic for them to send samples into a laboratory to conduct fire assaying. This

implies that survey data are oft limited use to determine ore grade and gold recovery rates.
- Data reliability: As mercury use is illegal and actively prosecuted, survey data collected on ore extraction and processing in relation to mercury has limitations.
- Geographical limitations: Miners usually extract and process ore in different locations, which can also be different soums. This especially applies if part of the ore is illegally processed with mercury. Since it is not possible to determine the geographical location where the mercury is actually applied, mercury estimates – which are presented at the soum and aimag level in Mongolia – need to define how the administrative unit (i.e., soum) is assessed (i.e., location of ore source or ore processing).

Additional information on mercury use in the three aimags from KII and secondary reports are discussed below:

Selenge aimag

The first recorded use of mercury for gold production in Mongolia has been linked to a German-Russian-Mongolian joint venture named Mongolor that began using mercury processing in 1913 for hard rock gold amalgamation, a standard practice for the time. Mongolor operated in the Boroo river basin, today known as Mandal in Selenge aimag. A leak in the amalgamation basin in 1956 released a large amount of mercury and formed a significant anthropogenic mercury deposit in the Boroo river basin. Contaminated water was detected 10 km downstream from the accident site. Although the Government of Mongolia implemented a national decontamination campaign in 2008-2009 on mercury polluted sites, Boroo river basin still remains contaminated and it has been indicated that artisanal miners still extract mercury from the Boroo river area to process gold (Government of Mongolia, 2020).

Violations related to the use of mercury have been reported by local authorities in Mandal and Bayangol. Prior to 2000, people in Bayangol used large amounts of mercury in processing. While mercury has been banned in 2008, the local government believes that there is continued illicit use of mercury. During the KII interview, it was reported that mercury was found in the soum resident household in 2019. Currently, the soum's action plan does not include any action to educate about mercury use or the elimination of its use.

In Bayangol, there is currently no mercury-free processing facility, but an unknown number of mills operate in the Nart processing facility area. In 2017, soil and water samples collected from the Nart area tested negative for mercury. It is suspected that miners process their ore at the mine site and transport the concentrate elsewhere where they then use mercury for upgrading. A miner interviewed at the mine site revealed he uses mercury in ore processing and confirmed this process.

In Mandal, there are four ore processing plants but none of them is currently permitted. In the processing plant built with the support of the Government and SAM project (in 2008), the equipment is outdated, and the shaking tables are not configured and operated properly for effective gold separation. The other three processing plants belong to private owners. However, supposedly mercury-free facilities in the soum were reported to use

mercury. The main reasons for the mercury use may be the inefficiency of the mercury-free processing plants and the low market price.

Gobi-Altai aimag

There are three gold ore processing plants in Gobi-Altai of which two are in Yusunbulag and one is in Altai, Gobi-Altai. But all of them have no official permits or licenses. Therefore, they were closed and sealed in 2019 to restrict and prevent the use of mercury. Despite these actions, there have been several recorded cases of mercury leaks in the aimag, which were reportedly immediately decontaminated.

As was reported by local officials, local authorities follow the MET guidelines on the reduction and control of mercury use. As part of the NAP research, soil, slimes and slime water samples were collected during a field study from January to April 2018, from ore processing facilities in Yusunbulag, Altai and Chandmani, and the results show that the mercury content in the samples does not exceed the permissible level. Although mercury use has been significantly reduced in recent years, it is still occasionally reported, and in 2019 mercury was found in a school canteen, as well as in a goldsmith's workshop in Yusunbulag at the aimag center.

The aimag's action plan does not include measures to educate about mercury use or alternative processing methods. Miners have built a processing plant and the detailed environmental evaluation is under review. When the environmental inspector conducted an on-site inspection, no mercury was detected. Government officials revealed that they do not have practical knowledge of chemical substances, neither do they have any equipment nor tools to investigate the presence of banned chemical substances. When they seize suspicious chemicals, they have to send them to Ulaanbaatar which is costly.

Khovd aimag

In Altai, there are no processing facilities. According to the aimag environmental inspector, heavy metal samples were taken from the soil at potential mercury sites, but no mercury was detected as of 2018. There have been calls from citizens that informal miners are using mercury, but this has not been confirmed. Though the local inspectors lack technical tools to detect mercury, the aimag police officer reported that artisanal miners use mercury and there were some cases where mercury was found during inspections.

5.3 Knowledge on the Health Effects of Mercury

Understanding the environmental and human health implications of mercury use in mining is an important facilitator for miners to move towards mercury-free processing. The NAP report (Government of Mongolia, 2020) states that several studies in Mongolia have detected symptoms related to mercury intoxication and/or concentrations of mercury in blood and urine level above recommended thresholds among artisanal gold miners in Mongolia, ranging from low to dangerous levels. In addition, a health assessment survey, conducted by the NAP team, revealed that the capacity of healthcare workers to detect, diagnose and treat mercury intoxication is limited.

While it was beyond the scope of the study to assess the prevalence of mercury intoxication in the study population, this section provides a brief overview of the respondents' knowledge in the study areas on the possible health effects of mercury use.

The majority of respondents (94%, n=349) answered that they are aware that mercury is toxic for humans. There was no difference in awareness between male and female respondents (94%, both), with reported unawareness being slightly higher in Bayangol (10%) compared to the other four areas.

In a follow-up question, respondents were asked to describe the major impacts of elemental mercury use on health. Since mercury can affect different organs and mercury intoxication often has a subtle onset of various, unspecific symptoms, this question had its limitations in assessing knowledge gaps. Out of the 349 respondents who had answered the previous question with yes, 78 respondents (22%) could not answer this question, indicating that the previous answer was strongly biased by social desirability bias. Seventy respondents (20%) named other health impacts that are typically not linked to mercury intoxication (e.g., osteoporosis, cancer), which cannot be considered as major health implications (e.g., skin rash, respiratory and gastrointestinal effects that only occur during an acute elemental mercury intoxication, infertility or liver damage), or could not specify their answer at all and said that mercury impacts the whole body (n=23).

This indicates that the number of miners with some basic knowledge of health implications associated with mercury use is much lower (around 54%), with a slightly higher awareness among women (57% compared to 53% in men). In total, 44% of all respondents correctly named the neurological system and the impact on fetal health as the most important target organs. Figure 5-4 shows that the knowledge did not differ significantly between men and women.

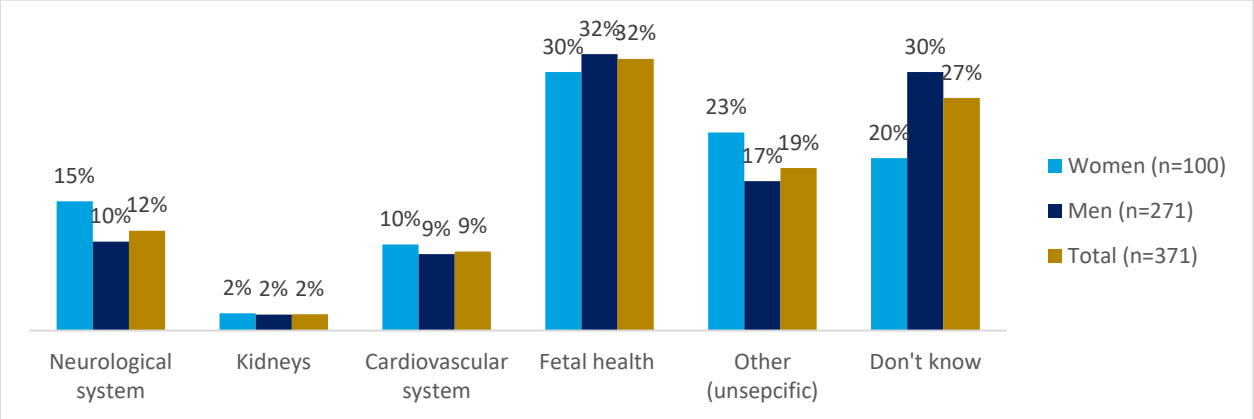


Figure 5-4. Main reported impact of mercury on human health, by gender and total

A female miner from Gobi-Altai emphasized the need for training on mercury impacts, highlighting that mercury intoxication is hard for miners to grasp due to the slow onset of various symptoms and the short term need to earn money:

> *The family members and other people involved in mining are not aware of the dangers of mercury because it does not look like an open scar. Also, some people know about health consequences, but want to make money for today.*

KII, female miner, Gobi-Altai aimag

However, the interviews with key stakeholders indicate that knowledge on the toxicity of mercury as well as other health hazards in ASGM areas is limited. The need to train miners on the health implications of mercury use was also raised by NGO and partnership leaders, as well as local officials in respect to general capacity needs of miners (Chapter 8). Overall, the survey could cover mercury and health only to a limited extent due to the sensitivity of the topic and time constraints. The questions asked during the survey are not detailed enough to assess knowledge gaps on mercury intoxication among miners.

5.4 Conclusions

Since 2006, the Government of Mongolia has taken steps to reduce the use of mercury in ASGM and to decontaminate polluted areas. In 2008, Mongolia banned the use of mercury in any form in mining and ore processing. A number of legislative acts have been approved, and the latest is Resolution No. 317, the "National Action Plan for Reducing Mercury Pollution caused by ASGM in Mongolia" (NAP), which was issued in connection with the ratification of the Minamata Convention in 2015. However, there is still hidden use of mercury in artisanal mining, though it is difficult to estimate how much mercury is used in ASGM itself.

While the assessment of current mercury use was challenging in the five study areas due to its illegality and fear of prosecution by miners, the survey indicates that there were cases of mercury use, trade and soil contamination with mercury in all three aimags. This finding is in line with the mercury estimates of the NAP team. If miners do not have access to mercury-free processing facilities (see Section 4.1), miners will continue to use mercury. Miners who work in hard rock deposits often do not have their own processing plant. They depend on service providers who run ASGM gold processing plants. The current alternative to mercury, namely sluices and shaking tables, are hardly used by miners due to very low gold recovery capacity, questionable quality and high maintenance costs. In addition, some of the accessible technologies are mistrusted by miners as they believe that owners configure their equipment to recover less gold in order to retain gold in tailings. Sometimes, if miners feel that the gold recovery is not high, they ask for middlings to take home for amalgamation. Mercury was historically used for whole ore amalgamation, but currently is mostly used in private to amalgamate middlings. The clandestine use of mercury is likely to continue in the sector in Mongolia unless miners receive access to good processing technology in the form of self-owned mercury-free systems or fairer profit-sharing schemes with third-party mercury-free processors. Due to lack of access to good technology and ownership of gold production and processing chains, mostly informal artisanal miners are likely to continue to use mercury in gold processing.

Estimating the current amount of mercury used in the sector is an important prerequisite to understanding the magnitude of the problem, to implement evidence-based interventions and to monitor their success; monitoring the use of mercury in the sector is also fundamental to the effectiveness evaluation of the Minamata Convention. While the project team attempted to derive mercury estimates from primary ore and gold production data from the field, it was not possible to calculate reliable estimates due to

several methodological constraints, especially the reliability of reported data (influenced by socially influenced reporting behaviour, poor record keeping practices and lack of scientifically assessed gold grade and gold recovery data) and the difficulty to determine the ore volume out of the total ore volume processed, that is more prone to be processed with mercury (i.e., middlings).

Understanding the dangers that mercury use poses to human health and the environment, is an important prerequisite to motivating the mining community to switch to mercury-free processing systems. Based on the survey, the number of miners with very basic knowledge on health implications of mercury use was low (54% of all respondents) and local key stakeholders emphasized the need to train miners on the health and environmental impacts of mercury use (Chapter 8).

6. Gender Mapping in the Artisanal Gold Mining Sector

The objective of this chapter is to summarize the gender dynamics in the artisanal and small-scale gold mining sector at the project sites, and their social and economic implications on women and men miners in Mongolia. Furthermore, these findings inform the project about opportunities and barriers that need to be addressed in project activities in order to improve gender equality in the sector. This is done by mainstreaming gender throughout all project activities in an adequate way.

Section 6.1 mainly summarizes socioeconomic characteristics (see Chapter 2) from a gender perspective, as that tends to influence gender dynamics such as education, marital status, and income. Section 6.2 analyzes gender dynamics within artisanal mining organizations, with a focus on organizational form, gender division of labour, leadership, capacity building and other factors. Since artisanal miners often work in family units in Mongolia, the occupational and domestic sphere tends to be closely interlinked. Therefore, Section 6.3 describes gender dynamics in the domestic sphere with a focus on the division of labour for domestic tasks, and the roles of women and men in decision-making.

The gender mapping component was conducted through a quantitative survey among 100 women miners and 271 men miners as well as key informant interviews with local and national government officials, partnership leaders and civil society organizations (see Chapter 1). Since gender is a sensitive topic that is challenging to adequately address during formal interview situations, in-depth interviews were conducted with women miners by the planetGOLD Mongolia team. The 30 women miners interviewed were identified during the quantitative survey in the five target areas based on their increased interest, awareness and/or knowledge of gender issues in the sector (see Annex D for methodology).

6.1 Socio-Economic Characteristics of Women and Men Miners

The socio-economic status of the survey participants has been described in detail in Chapter 2, with a focus on the socioeconomic characteristics of survey participants by study area. This section provides a brief overview of some of the socioeconomic characteristics that can have an influence on gender dynamics within artisanal mining organizations.

Age and Marital Status

The age distribution of women and men miners showed similar patterns (Figure 2-1), except for a higher proportional number of men miners in the age group 18 to 29, which may be explained by the higher number of unmarried men (16% versus 7% of women). The majority of women interviewed (76%) are in their reproductive age (below 50 years), which is important to note since several occupational hazards in mining can have negative impacts on fetal development. For example, heavy lifting or exposure to chemicals can cause neurological issues. Overall, the percentage of male singles was slightly higher than

that of female singles at each site, with the highest number of male singles found in Bayangol (22%) and Mandal (21%). Mandal (18%) also had the highest number of female singles. The majority of respondents (87% of women and 80% of men) were married (Figure 6-1). The high number of married women can be explained by the fact that women often enter the sector with their husbands or other family members (Asia Foundation, 2013). The number of divorced or separated miners was very low among women and men. In two sites some women miners were widows: Mandal and Altai soum (7% of the female respondents at both sites).

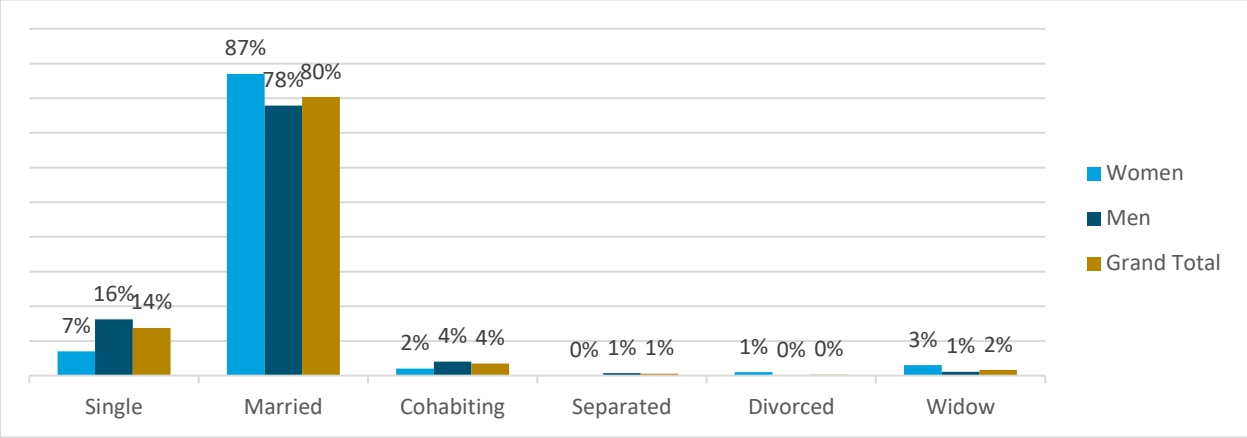


Figure 6-1. Marital status of respondents, by gender and total (n= 100 women, 271 men)

While the household size was recorded during the survey (Figure 2-2), the number of children of female and male respondents was not assessed.

Education

The educational status of the respondents shows a reversed gender gradient, with a higher educational status being found amongst women. This finding is in line with the national average in Mongolia (IRIM, 2014). Most women (88%) have at least a high school diploma, compared to 73% of men (Figure 6-2). The share of women with primary school attendance only was the highest in Altai (7% of women in this region). However, the percentage of women with higher education (bachelor's degree) was also the highest in Altai (29%).

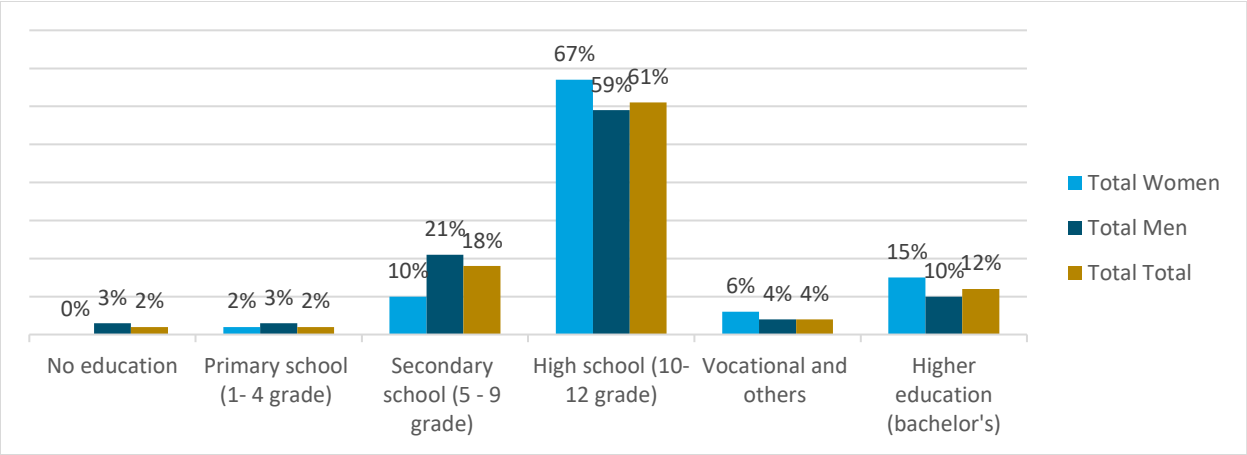


Figure 6-2. Education of respondents, by gender and total (n= 100 women, 271 men)

Employment

Half of the respondents (49% of women and 51% of men) stated that artisanal gold mining is their primary employment (Table 2.3-3). Other primary income sources for women and men mainly comprise of self-employment (13% and 15%, respectively), retirement for women (7%) and herding for men (9%), while 7% of both women and men were unemployed. The highest number of unemployed respondents was recorded in Altai (21% of women and 13% of men). For those with mining as their primary income, more men (37%) were more often engaged in a secondary form of employment outside of mining than women (27%). While 15% of women and men work in agriculture as farmers and/or herders for their secondary income source, 17% of men miners are also self-employed.

Access to Social Services

Access to social services such as social insurance, health insurance, health care and childcare are crucial for women and men. However, some services such as access to pre- and post-natal health check-ups and childcare are an important determinant of women's physical and mental health which is why they should be examined (see Section 6.3).

The survey shows that only one third of women and men miners (36%) pay social insurance fees on a regular basis (Figure 6-3). However, more women pay regularly for health insurance (77% of women versus 58% of men). While health insurance is an important facilitator to access health services, availability and accessibility are other important facilitators (see Chapter 2). The survey revealed that 37% of respondents do not have access to basic health services in the study areas. Access to health care does not differ significantly between women and men, but between study areas (range of 50% in Altai to 80% in Tunkhel). While the range and quality of health services was not assessed during the survey, the data indicates that access to health services remains a challenge for both women and men artisanal miners.

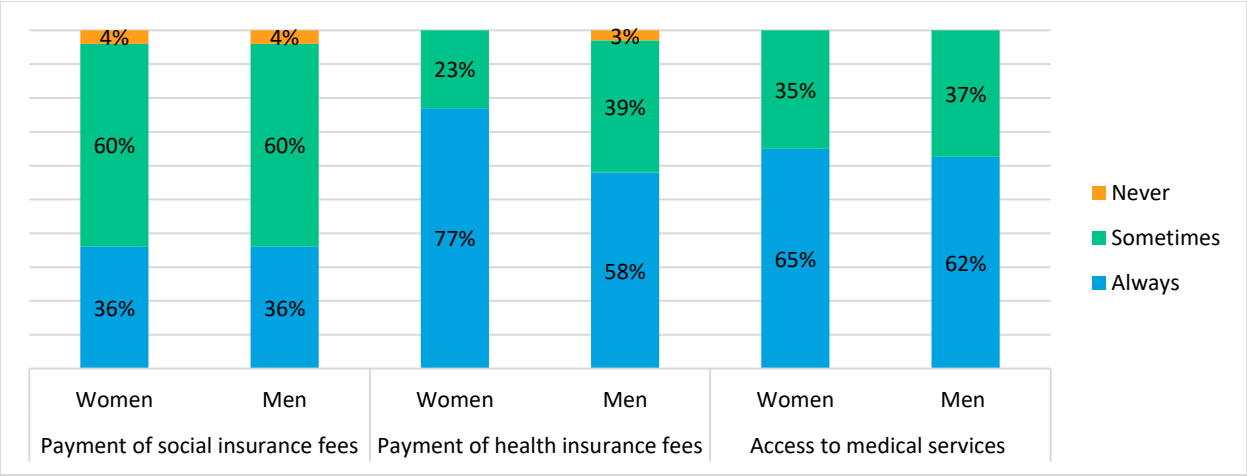


Figure 6-3. Access to social services of respondents, by gender (n= 100 women, 271 men)

Childcare

Access to childcare was not addressed during the survey but was raised as a concern during the in-depth interviews with women miners. It should also be noted that 80% of the female respondents reported being involved in childcare versus 50% of the male respondents. In addition to this, women miners spend more hours per week on household chores than men (Section 6.3), and lack of formal childcare services or family support which in turn has led to a double work burden of productive and reproductive care for women. If miners have to move to temporary settlements to work on artisanal mine sites, lack of access to organized childcare can pose additional challenges. Two respondents from Tunkhel village in Selenge aimag explained that their children tend to stay in their hometowns with grandparents or relatives to ensure access to education and health care. This gives the parents additional time to work at mine sites (1 to 2 months). However, the two respondents expressed concern for their children's physical and mental development due to the separation from their mothers. The seasonality of artisanal gold mining in Mongolia, and the requirement for temporary migration to mine sites by mothers may have impacts on children's mental well-being. To understand the need for additional childcare support services for children at mine sites, additional investigation is required.

6.2 Gender Dynamics in the ASGM Sector

Gender Ratio and Work Time in the Sector

According to the results from the site assessment within the project (planetGOLD Mongolia, 2019), an artisanal gold mining team typically consists of 9 members, with 7 being male and 2 being female. Thus, it is estimated that around 28% of the artisanal mining workforce in Mongolia consists of women miners, with regional variations. According to a report from the Asia Foundation (2013), 22% of miners were women in hard rock mining, and 33% in alluvial mining. Since men are usually hired for physically challenging jobs (gender division of labour), the number of available jobs for women is limited. Few women reported working in ore extraction and processing, while the majority reported working in supportive and administrative roles.

Among the survey respondents, the relative number of women with more than five years of work experience in the sector was almost the same as men miners (58% and 59%, respectively). More men had joined the sector in the last year than women (14% of men versus 9% of women). Relatively speaking, women have the same standing in the sector as men in terms of work experience. However, more men tend to work the entire year (over 55% of all male respondents versus 40% of female respondents), whereas around 55% of women tend to work seasonally from April to October (Figure 6-4).

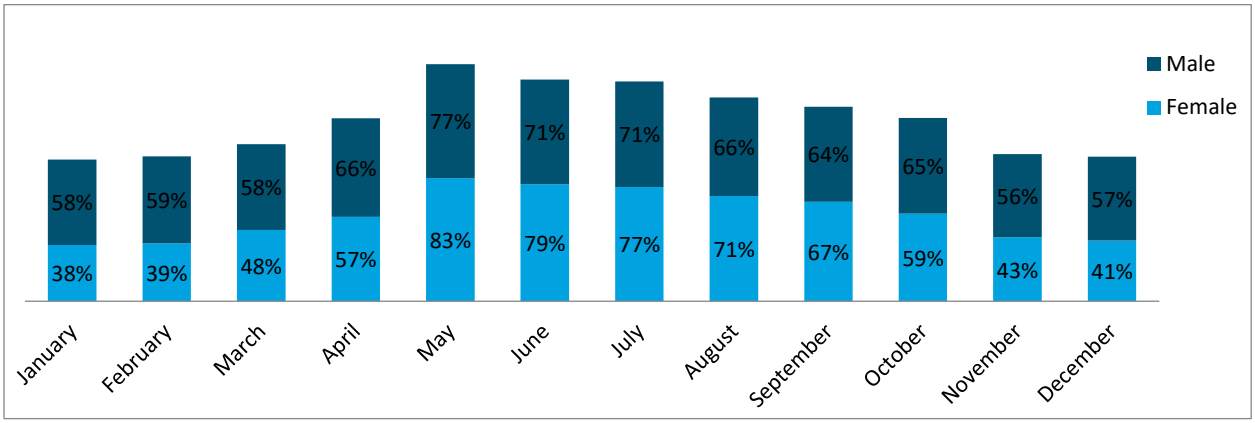


Figure 6-4. Active working months in ASGM by gender (n= 100 women, 271 men)

Table 6.2-1. Period of employment in ASM (monthly, weekly, and daily) by gender

	Women (n=100)	Men (n=271)	Total (n=371)
Average Working days in a month			
Up to 9 days in a month	17%	14%	15%
10 days in a month	13%	13%	13%
11 - 20 days in a month	47%	47%	47%
21 - 31 days in a month	23%	26%	25%
Average working days in a week			
1 day	13%	15%	15%
2 - 3 days	26%	26%	26%
4 - 5 days	37%	34%	35%
6 - 7 days	24%	25%	25%
Average Daily working hours			
Up to 2 hours in a day	7%	1%	2%
3 – 5 hours in a day	13%	12%	12%
6 - 8 hours in a day	38%	44%	43%
9 or more hours in a day	42%	43%	43%
Total	100%	100%	100%

There were no significant differences between women and men miners in the monthly, weekly and daily amount of time spent in the sector (Table 6-1). This information implies that while women are slightly more often than men involved in seasonal mining, both spend a similar amount of time in the sector during active months.

Organization

Women and men were organized in similar patterns, but with some slight differences: Women tend to be members of an ASM NGO or an unregistered partnership, whereas men tend to belong to a registered partnership, to an informal group or no formal organization.

Whereas those mining organizations are open to women and men miners, none of the study areas has a designated women miners' organization (planetGOLD, 2019).

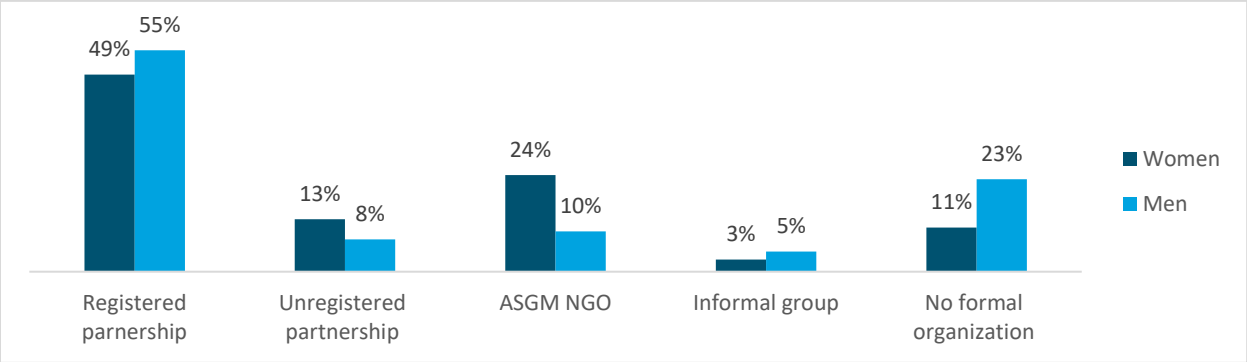


Figure 6-5. Organizational affiliation of respondents, by gender (n= 100 women, 271 men)

Gender Division of Labour in ASGM

Women and men often perform different tasks along the gold supply chain, influenced by socio-cultural norms and beliefs, education (which is also influenced by gender norms), skills, preferences, power dynamics, level of formalization, etc. The survey revealed that most women are involved in supportive services (91%), but also play a major part in management, and ore extraction and processing, whereas almost all men (>97%) are involved in ore extraction and processing (Figure 6-6).

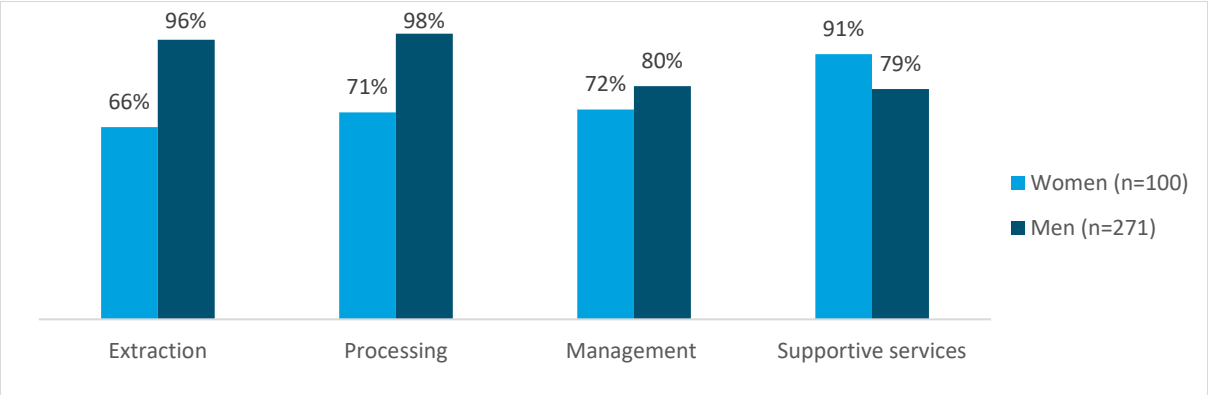


Figure 6-6. Respondents' involvement in different steps of artisanal mining

However, when looking at the distribution of the different tasks within and across those four major categories, the gender division of labour becomes more apparent (Figure 6-6). The top five tasks men perform are crushing ore and panning (59%, each), ore extraction and tasks underground (54%, each), and grinding (52%). The top four tasks women perform are all linked to supportive services, specifically food preparation (79%), purchasing food and other items (63%), washing dishes (61%) and cleaning (55%). For women miners, the fifth most frequently performed task is linked to securing finance (49%).

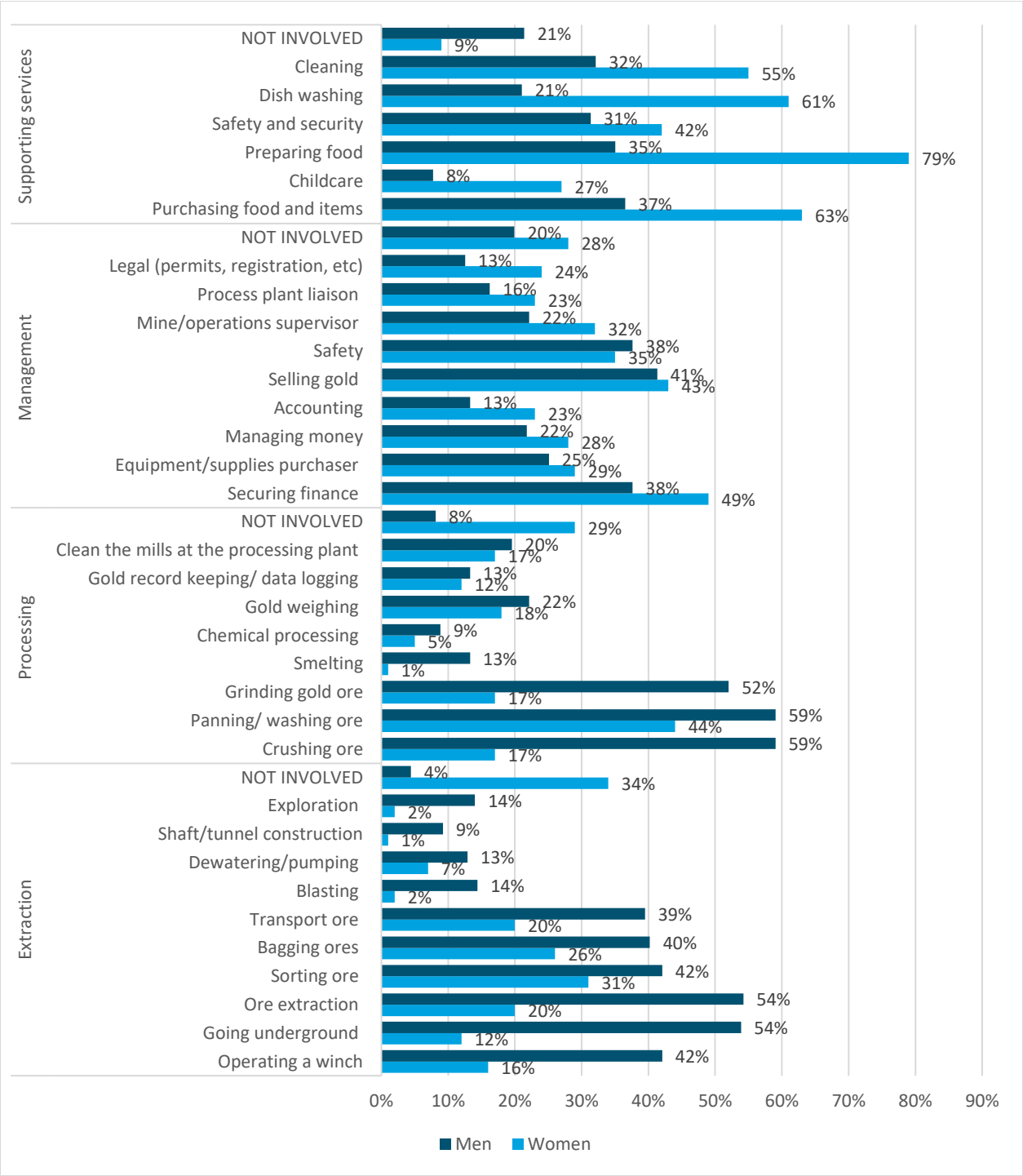


Figure 6-7. Gender division of labour in artisanal gold mining in the five study areas (n=100 women, 271 men; multiple answers recorded, total = 3,732)

While 28% of all women miners surveyed are not involved in management activities, those women who are involved, are responsible for individual tasks at least as frequently as men. For example, 24% of female respondents are involved in acquiring legal permits and 23% are involved in accounting, compared to 13% of men (for both activities). Almost

every second woman (49%) is involved in securing finance. The gender division of labour at the five study areas also shows that women play important roles in ore extraction (especially sorting ore, 31%) and ore processing (panning, 44%).

The gender division of individual tasks differs between study areas. For example, all women in Altai are involved in some tasks related to ore extraction and processing. Information shared by participants from Altai soum indicated that in Mongolia's western aimags, there is a stronger adherence to traditional cultural norms; hence, men are more often in control of selling gold, procurement, and monitoring financial transactions. However, these trends are difficult to confirm with the survey data on a local level, due to the small sample size of women (n=14) in Altai (see Table 6-2). In the other target areas, women are more often in charge of management tasks, especially in Mandal soum and Tunkhel village.

Mine site supervisor filling out the shift logs in Tunkhel village (photo taken by planetGOLD Mongolia)

Table 6.2-2. Involvement of women and men in management tasks, by study area (green ≥ 50%, yellow ≥ 25%)

	Women						Men					
	Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	**Total**	Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	**Total**
Number of respondents	*15*	*28*	*20*	*23*	*14*	***100***	*37*	*84*	*51*	*39*	*50*	***271***
Securing finance	53%	61%	60%	30%	26%	**49%**	27%	37%	49%	41%	33%	**38%**
Purchase equipment/ supplies	7%	39%	50%	22%	11%	**29%**	14%	17%	39%	36%	25%	**25%**
Managing money	0	43%	50%	22%	5%	**28%**	11%	13%	41%	33%	17%	**22%**
Accounting	0	25%	40%	26%	11%	**23%**	3%	11%	24%	21%	10%	**13%**
Selling gold	33%	50%	55%	22%	42%	**43%**	27%	33%	53%	10%	72%	**41%**
Safety	0	36%	55%	30%	37%	**35%**	24%	23%	51%	41%	53%	**38%**
Mine/operations supervisor	7%	46%	45%	17%	26%	**32%**	8%	18%	27%	21%	33%	**22%**
Process plant liaison	0	32%	45%	13%	11%	**23%**	8%	17%	27%	18%	10%	**16%**
Legal (permits, registration, etc.)	13%	25%	40%	22%	11%	**24%**	8%	11%	22%	15%	8%	**13%**
Not involved	20%	18%	35%	57%	0	**28%**	30%	35%	14%	15%	2%	**20%**

Representatives from local governments noted that the transition from illegal mining to NGOs and partnerships has permitted the introduction of new technologies in ASM. This is easing women's workloads, but further specification on these technologies was not included. According to the KII with ASGM NGO and partnership leaders, as well as heads of civil society organizations, women are primarily involved in "light" tasks such as dust removal, packaging, sorting, sieving, gold washing and cooking, budgeting and procurement. An official from the ASM NF also highlighted the involvement of women in administrative and financial tasks. In contrast, men do all of the "hard" jobs related to extraction, transportation, handling and crushing of rocks, digging dirt and heavy work. This was also expressed by a partnership leader:

"There are 2 female and 7 male members in our partnership. The women are responsible for gold washing and cooking. Women aren't suitable for lifting heavy weights and are more prone to injuries. The labor division is not equal: easy labour is for women and heavy work is for men. We work from 8 to 9 hours on the mining site."

KII, male partnership leader, Khovd aimag

Two women working at the site, screening dirt and ore in Tunkhel village (photo taken by planetGOLD Mongolia)

While the data set from the survey also shows women's roles in ore extraction and processing, 17 out of 30 women miners identified during the in-depth study, noted that tasks requiring hard labour in artisanal mining are a major challenge in the sector for women. Most of these women have been involved in hard labour at some point such as carrying bags of heavy rocks, working in deep shafts with heavy tools, and uploading ore from shafts at mine sites. Women miners working in Bayangol, Mandal and Tunkhel had more experience working in shafts. Whereas women in the western aimags (Altai and Yusunbulag) tend to be more often involved in tasks such as carrying heavy rocks due to rudimentary technological infrastructure and low levels of mechanization, as well as the absence of a formal processing plant in Altai. The geographical differences in interview findings show that local processing systems also impact the roles of women in the sector. Hence, the gendered division of labor can be influenced by various factors such as the type of ore deposit (placer versus hard rock deposits), the level of mechanization, as well as the social fabric of the workforce at a mining site (i.e., whether the organization mainly consists of family members, friends, or unrelated individuals).

Gender stereotypes and cultural beliefs within a society and especially within the male-dominated mining industry can lead to the perception, especially among men miners, that women are not allowed or supposed to perform certain tasks in the mining sector. Women were asked during the in-depth interviews whether customary laws and beliefs or social norms impact gender roles or social relations in general in the ASGM sector. None of the women clearly affirmed this. Six out of 30 women said that the role of women in ASGM would not be impacted by sociocultural norms and values. Eight out of 30 women answered that they have encountered negative tendencies while working in ASGM. While these women did not specify their answer, other studies have shown that mining is not always considered as a respectable income source in Mongolia (Asia Foundation, 2013). However, women also stated during the discussion on training needs that they are not familiar with gender as a concept. Hence, women might not be aware of or not willing to disclose certain gender-based discriminatory structures in the artisanal gold mining sector.

During the survey, 90% of men and 81% of women answered that there are certain tasks women are not supposed to do in mining (Figure 6-8). Those tasks mainly include the work in shafts and tasks involving heavy lifting (i.e., mainly tasks linked to ore extraction). According to Figure 6-7, 66% of women are involved in the extraction process. However,

the number of women involved in work related to shafts is low (12%), while more women are involved in ore sorting (31%), bagging (26%) and transportation (20%).

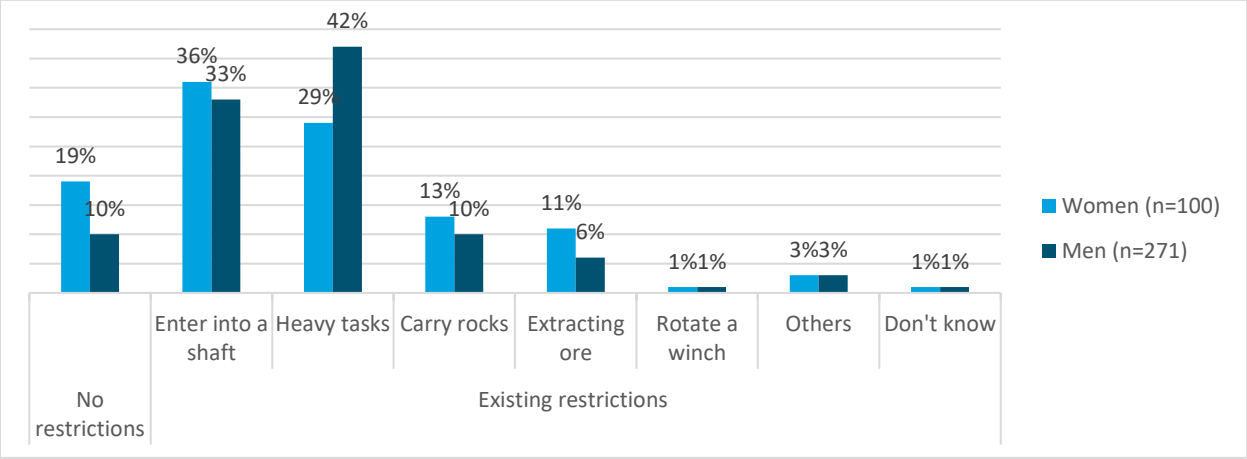


Figure 6-8. Respondents answer to the question whether there are certain tasks women are not allowed or supposed to perform in the sector (multiple answers recorded, t = 407)

Overall, there appears to be a belief amongst women and men miners that women should not be involved in labor-intensive and potentially dangerous tasks for protective reasons. This belief stems from the idea that women must be protected from potentially dangerous tasks at mine sites for their own personal protection, not for discriminatory purposes that may also restrict women's access to resources. The finding that income is mostly shared equally amongst women and men – independent of their tasks within the group – supports this assumption and was further explained by a partnership leader.

> *"Partnership members spare women from doing hard work, however, since everyone works at the site, incomes are distributed equally. ...Men do more work. In fact, all mining work is done by men, I guess. Women cook and do housework"*
>
> **KII, female partnership leader, Gobi-Altai aimag**

However, an equal benefit-sharing mechanism does not seem to be prevalent in all mining groups (see income). In this case, this belief can inadvertently cause economic disadvantages for women miners, since men will be hired for physically strenuous jobs that are better paid. Due to this, if the income men miners earn from labour intensive jobs are not split equally within a mining group, women miners will be economically disadvantaged. An official from the ASM NF further supported this, by pointing out that the gender division of labour in artisanal mining can create inequalities in access to resources and income. This shows that income equality within the sector can vary from group to group. The influencing factors that determine income equality require further investigation.

Power Dynamics, Leadership and Decision-Making at the Mining Site

Decision-Making

The gender division of labour already provides a good overview about the different roles and responsibilities women and men are engaged in in artisanal mining. Figure 6-9

provides an overview of how many women and men consider themselves as actively involved in the decision-making process of selected activities. While only 2% of women are involved in exploration activities (Figure 6-7), 22% are involved in decision-making regarding exploration. While men are more often involved in decision-making in most processing steps, women are more often involved in decision-making regarding waste disposal. This finding corresponds with other findings which show that women are more likely to be responsible for due diligence compliance, including environmental performance. In addition, women are more often involved in decision-making regarding administrative issues, and similarly involved in issues pertaining to profit distribution and finance.

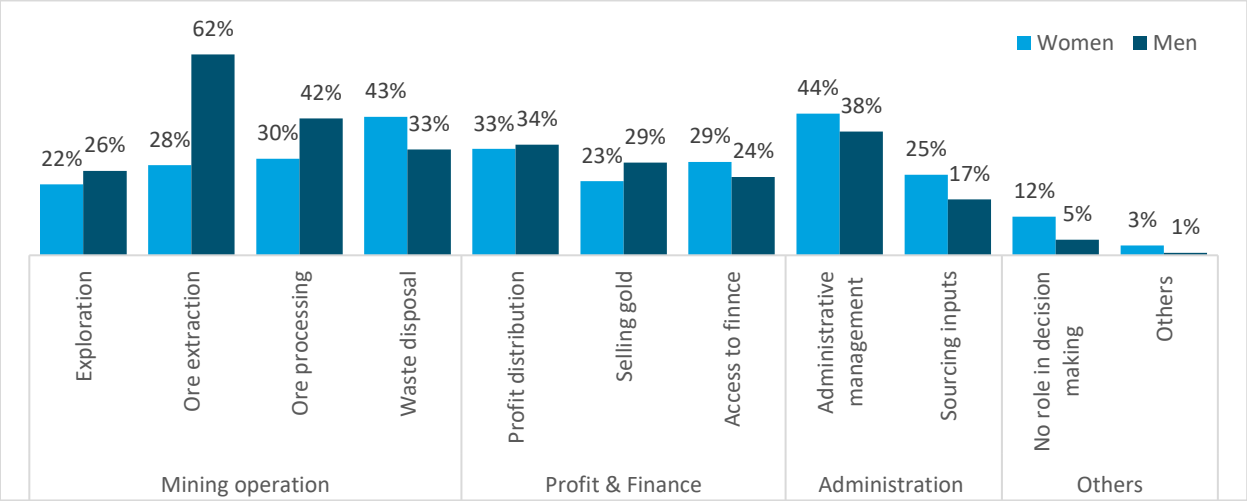


Figure 6-9. Involvement of women and men miners in the decision-making process of selected activities, by gender (n=100 women, 271 men; multiple answers recorded, total=1,139)

The findings from the in-depth study also confirm that women and men miners tend to have mutual rights when it comes to participating in decisions and revenue sharing at work. In the domestic sphere, women primarily have leading roles in decision-making at the household level and addressing domestic or family issues (Section 6.3). According to the findings, most women (19 out of 30) revealed that they participate mutually in decision-making processes at the mine sites. In addition, they emphasized that solutions or decisions are made based on a mutual discussion with partnership members. Furthermore, nine women miners pointed out gender-related differences in decision-making processes, with some seeing women and others seeing men in dominating roles.

Leadership

The previous section on the gender division of labour in artisanal mining shows the involvement of women in important management tasks, such as acquiring legal permits and registration, securing finance and selling gold. At the same time, 88% of women are involved in making decisions regarding various activities along the supply chain (Figure 6-9). These findings indicate that women have an important influence on the decisions

pertaining to management systems at the mining sites and hence, also perform leadership functions.

From the 47 partnership and NGO leaders who participated in the survey, 19 were women and 28 were men. Women are more likely to be the leader of an NGO than a partnership, as ten out of 15 leaders are women, compared to six women out of 26 registered partnership leaders (Figure 6-10). Taking into account the smaller share of women in the survey population, which is reflective of the lower number of women in the ASGM sector in Mongolia, 22% of all female organized miners were leaders, versus 14% of all male organized miners. Key stakeholders from the ASM NF confirmed that women tend to be more frequently in leadership positions; around 60% of ASM NGOs in Mongolia have a female leader.

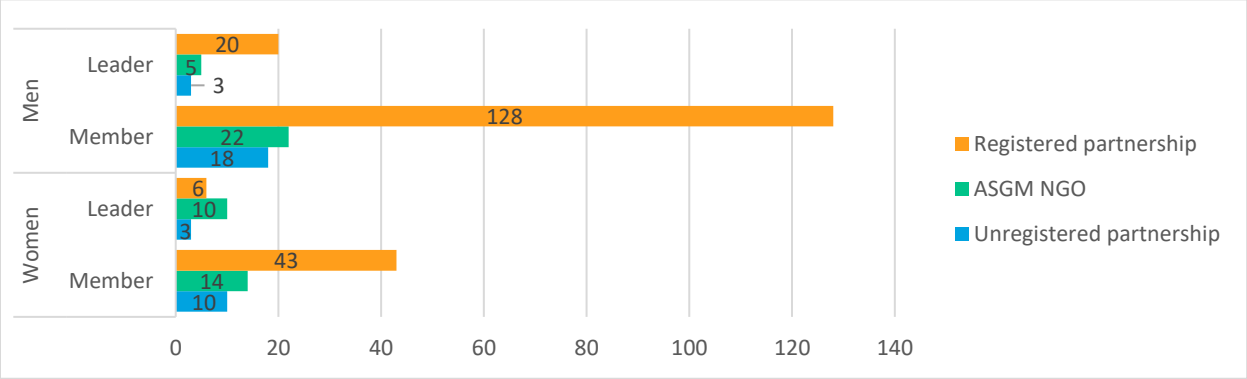


Figure 6-10. Number of members and leaders of ASGM organizations, by gender (n=282)

However, an analysis of the data according to the five study areas shows that female leadership varies geographically and is more prevalent in Mandal soum (8 female leaders, 5 of those leading registered partnerships) and Yusunbulag (6 female leaders, 5 out of them leading NGOs) (Figure 6-11). There were no female leaders in Altai.

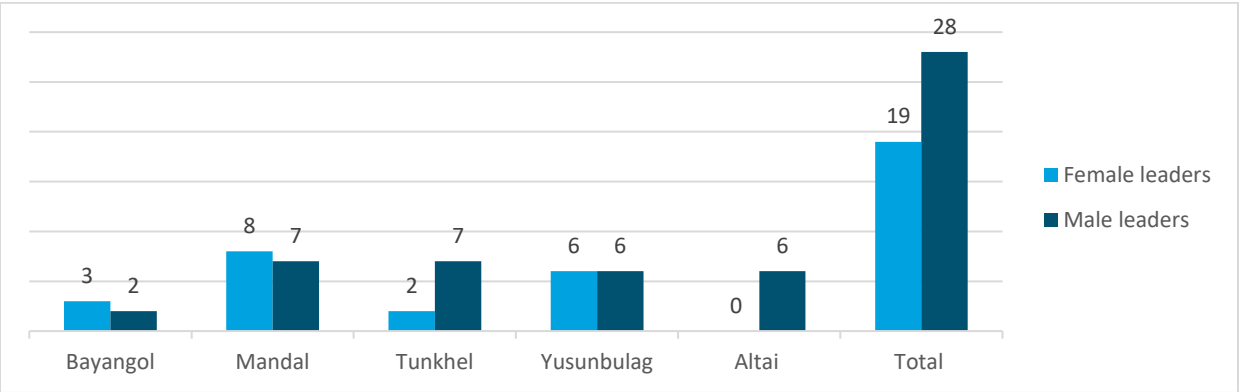


Figure 6-11. Number of female and male leaders, by study area and total (n=100 women, 271 men)

Preferences in Leadership

The respondents were asked during the survey whether they prefer a man or a woman as the leader of their respective mining organizations, in order to assess possible biases against female leadership. Overall, 42% of respondents prefer a male leader, while 22% prefer a woman leader (Figure 6-12). Women were more in favour of a female leader (31%) than men (18%). It is positive to note that over one third of all respondents (37%) had no preference (i.e., were gender neutral in their judgement over leadership skills).

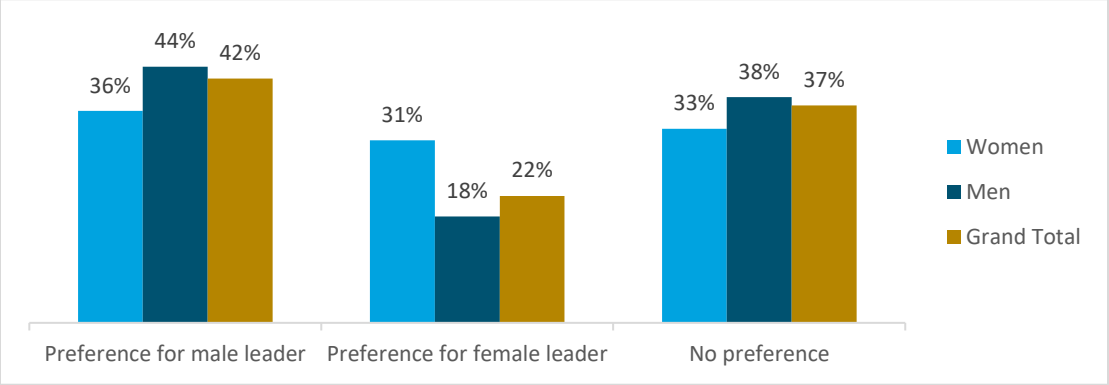


Figure 6-12. Gender preferences in leadership, by gender and total (n= 100 women, 271 men)

The gender preference for leadership in the five study areas is quite heterogenous (Figure 6-13). The preference for female leaders is the highest among women and men in Yusunbulag (39% and 46%, respectively); it is high among women in Bayangol (40%) but low among men (5%); and it is quite low for both women (21%) and men (5%) in Altai. These findings correlate with the level of experience in female leadership in the study areas. Respondents in Altai have a high preference for male leadership and have no current experience with female leadership. The low level of preference for female leaders in Bayangol and Tunkhel among men corresponds with the low level of current female leadership. Yusunbulag, on the other hand, where female leadership is preferred by women and men, also has more current female leaders. In addition, preference for a female leader was the highest in male ASGM NGO members (52%), whereas female members of registered partnerships were mainly in favour of male leaders (41%).

It can be concluded that women are considered as more capable and consequently occupy more leadership positions in mining areas where artisanal mining is more developed.

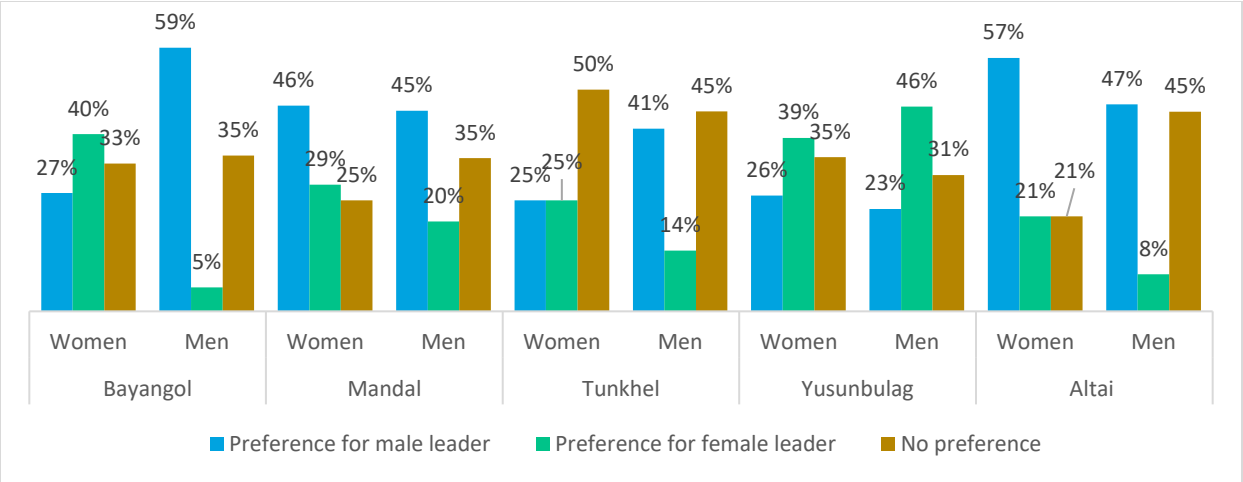


Figure 6-13. Gender preferences in leadership, by study area and gender (n= 100 women, 271 men)

Respondents with a gender preference were asked to explain their preference for a male or female leader (Figure 6-14). While many respondents were not able to provide concrete feedback, some did provide examples of best leadership practices amongst men and women miners. For example, men have more manpower or physical strengths and can adapt better to the challenging work conditions, are more knowledgeable and skillful and are better in working together with other men miners. However, both men and women miners acknowledged that the management skills of women leaders were better, for example in terms of managing finance or compliance with legal frameworks. In addition, women were considered as more reliable and responsible, which included different statements such as being more consistent, punctual, take care of others or do not drink alcohol. Interestingly, men miners considered female leaders as more honest than male leaders. The category "other/unspecific" includes general statements such as "men are better" or "women are gentler", which are not directly linked to leadership qualifications.

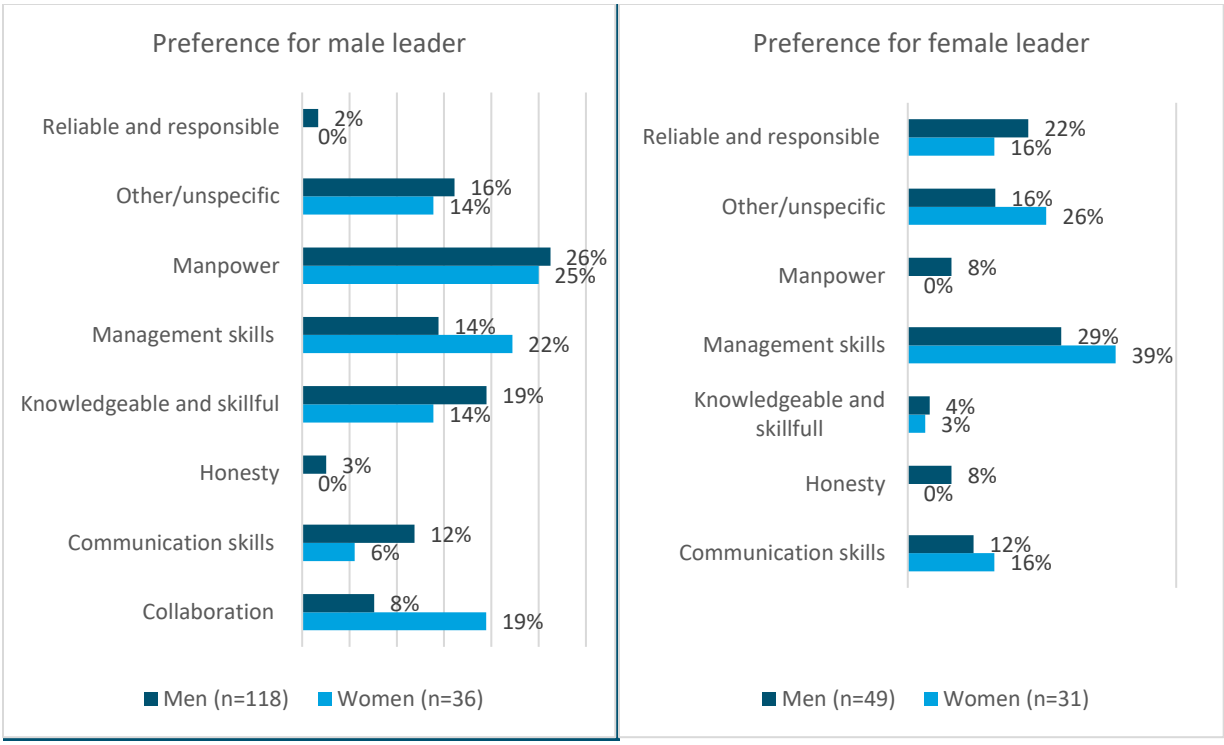


Figure 6-14. Reasons for preferring a male or female leader, by gender

Overall, the stronger involvement of men miners in the technical and physical aspects of ore extraction and processing seem to cause a preference for male leadership, especially among men miners. However, the organizational, managerial and communication skills of women are also valued. This is especially true in areas that are more formalized, where knowledge of legal frameworks is an asset, and where miners have already been exposed to female leadership.

Another important factor that can influence female leadership is the collaboration of ASGM group leaders with local officials. The in-depth study with women miners indicates that the support of an artisanal mining organization by local government officials rather depends on the level of formalization, rather than the gender of the leader. Ten out of thirty respondents highlighted they would have support once the partnership is formalized. The support from local authorities tends to be positive in two soums, Mandal soum including Tunkhel village, and Bayangol soum in Selenge aimag.

Access to and Use of Resources

This section looks at income, access to finance and control over means of production in artisanal mining from a gender perspective.

Income

As outlined in Chapter 2, 77% of respondents named artisanal mining as their main income source (78% of men and 76% of women). However, only 38% and 33% of all male

and female respondents stated that artisanal mining provides enough income for themselves and their families. This means that two-thirds of all respondents have to rely sometimes or always on additional income sources. The average monthly income among all respondents from artisanal mining was 980,163 MNT; this amount is 288,937 MNT below the national monthly average income of 1,269,100 MNT in the third quarter of 2020, though the average income differs by region and is below average in the Western region (916,000 MNT) and Central region (1,142,500 MNT) (NSO, 2020). Mongolia has a gender income gap; women earned 1,135,800 MNT and men 1,395,900 MNT per month in the third quarter of 2020.

The total reported monthly income and income from artisanal mining only did not show major variations between male and female respondents (Chapter 2, Table 2.6). The percentage of women in the lowest income category was slightly higher for both, total income (64% of women versus 62% of men) and mining income (41% of women versus 37% of men). However, it needs to be considered that mining income can be subject to large fluctuations due to the seasonality of work, access to high quality ore, and availability of work, as two partnership leaders pointed out. Since women tend to work slightly more often seasonally in artisanal mining rather than year-round compared to men (see section on work time above), it remains unclear whether the annual mining related income shows a larger gender gap or whether the income is split evenly amongst all members of a partnership or NGO throughout the year as well.

The survey findings indicate that gender related income inequality is not very prevalent in the five study areas. Equal pay for equal work is a fundamental concept in ensuring gender equality and one of its key indicators. Artisanal miners pointed out in face-to-face interviews that they equally divide the earned income regardless of gender, despite the fact men tend to do more strenuous and dangerous tasks, while women *are* more involved in supportive and administrative tasks.

> *"We equally divide income among members after deduction of expenditures."*
>
> **KII, male cooperative leader, Selenge aimag**

> *"Partnership members spare women from doing hard work, however, since everyone works at the site, incomes are distributed equally."*
>
> **KII, female partnership leader, Gobi-Altai aimag**

Women confirmed during the in-depth interviews that income is equally divided within their organizations. As for differences between men and women in revenue sharing or when negotiating fair prices, a significant number of respondents (27 out of 30 women) said they have no controversial issues over income division. They stated that revenue sharing is not linked to gender since they have a fixed salary for each task. Most importantly, they emphasized that they usually work or organize as a partnership based on family connections, which tends to raise less issues on revenue sharing.

> *"We usually go with our family or spouse to work at sites. I think, this pattern is common to other miners in ASGM. Once we work with our immediate family or relatives, it is unlikely to have unfair salaries or sharing as we negotiate well before starting our business."*
>
> **In-depth study, women miner, Gobi-Altai aimag**

However, information from KII interviews revealed that equal wage distribution is not prevalent in every artisanal mining organization in Mongolia.

> *"In my view, there is no equal wage distribution. Just a handful of artisanal cooperatives practice equal distribution of wages. It usually depends on a partnership's leader. Although members don't complain in the presence of partnership leaders, they talk about unequal wage distribution in their absence. They cannot discuss the issue with leaders as they are afraid of losing their jobs. In other words, partnerships are owner–centered institutions."*
>
> **KII, government officer, Ulaanbaatar**

According to government officials, human rights experts and the leaders of the ASM NF, differences in the gender division of labor and power allocation between men and women miners can constitute a reason for unequal distribution of both wages and profits. These observations could not be confirmed by the survey results in the study areas but do require a further investigation. It would also be interesting to investigate how far female leadership is associated with income equality within a mining organization. According to the leader of the ASM NF, the income disparity is attributed to the division of labor. A more detailed analysis of salaries and sources of income needs to be conducted in the target areas to get a proper understanding of the factors.

Access to Finance

The survey did not identify any major gender-related problems for women miners regarding access to finance. Around 29% of female respondents are involved in financial decision-making within the mining organization, compared to 34% of all men. In addition, more women said that they currently have a loan than men (61% versus 51%, respectively).

During the in-depth interview, 22 out of 30 women answered that there is almost no significant gender-related difference in accessing finance. They explained that all banks and other financial organizations require signatures and permission from both spouses when they request loans. Therefore, spouses tend to discuss financial issues before applying for any loans. However, they also stated that both women and men miners face challenges getting approval for loans due to lack of income guarantee and other qualifications. In very few interviews did women miners respond saying that men usually make decisions on getting loans.

Asked during the survey whether there are any specific challenges faced by women in accessing finance (Figure 6-15), 44% of respondents neglected this question. From the 30% of women who stated that there were problems, most of them provided explanations that do not seem gender related, such as the requirement for collateral, general difficulties in accessing loans and lack of permanent income.

Interestingly, more women in Yusunbulag (52%) reported issues for women in accessing finance, though only three women who reported in this area were involved in financial decision-making. It can be concluded that women answered this question more from the perspective of their mining organization and not from a gender perspective.

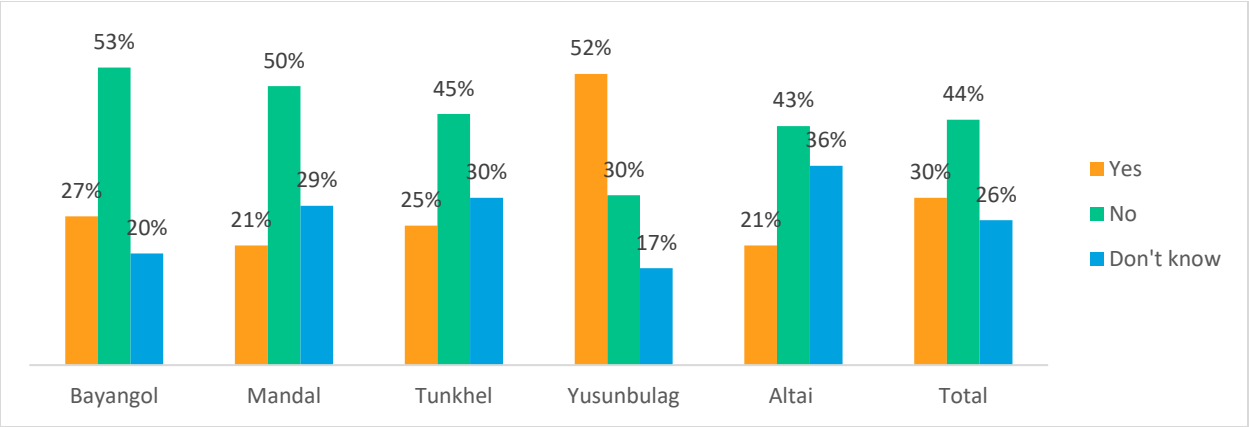


Figure 6-15. Problems faced by women in accessing finance, by study area (n=100 women)

Control Over Means of Production

Two other gender-equality indicators in the ASGM sector in Mongolia are the number of female owners of processing plants and shafts, since both indicate the role of women in controlling means of production. From 28 processing plant owners surveyed, 9 (32%) were women located in Bayangol, Mandal, Tunkhel and Altai. From 36 shaft owners surveyed, 9 (25%) were women. Considering again the lower number of women in the sector, this information reveals that some women do have control over means of production in the sector. On the other hand, women are more frequently employed as support workers (68%) compared to men (50%) who are more frequently employed as miners (38%, versus 13% of women). This indicates that there seems to be a larger gap among women in terms of access to resources, control and power than among men in the sector. However, this needs a further investigation in order to identify the groups of women who have disproportionately less access to resources and resource ownership. During the in-depth interview with women miners, women also confirmed that men and women usually have the same access to work tools at their work sites since they tend to purchase required tools and materials with their communal budgets. It should be noted that women also stated that they access work tools less frequently due to the gender division of labour.

Information and Capacity Building

Training is an important approach in capacity building for miners in the ASGM sector so that they acquire better mining practices. Section 3.6 describes the training completed by respondents in the past two years and summarizes training needs voiced by respondents. This section in Chapter 6 only summarizes the most important gender-related outcomes of this analysis since access to training is an important facilitator for empowering women in the artisanal mining sector. Training creates more favourable work conditions for women and aids in closing the gender gap between women and men miners.

Completed Trainings

In the past two years, 38% (n=141) of the respondents have attended artisanal mining related trainings, with a higher participation rate among women (47%, n=47) than men

(35%, n=97). Representatives of national and local authorities, human rights organizations and civil society community indicated during KII's that women are more active when it comes to participating in capacity building training. In the in-depth interview, the majority of women (22 out of 30) said that they had enough opportunities to participate in training, while 6 women revealed that they had constraints in participating in training and had limited access to information.

A gender-specific analysis of the training completed by respondents (Figure 8-5) reveals that women were more actively participating in all training topics covered by the survey, especially business management (16% of women versus 3% of men), environmentally sound practices (14% versus 6%), rehabilitation (14% versus 7%) and health (11% versus 6%).

Overall, the survey shows the limited amount of training women and men miners have received so far. This especially applies to training on gender and human rights (3% of women and 2% of men), which was the topic least covered by capacity building initiatives. While the survey did record which institutions had offered capacity building sessions, this information was not recorded per training subject. Hence, it is not possible to say which stakeholder had offered the gender and human rights training, though a representative from the ASM NF reportedly conducted training on gender-based violence in 2019 (see section on GBV).

Training Needs

The training needs raised by respondents during the survey show a similar pattern for women and men miners (Figure 8-7). Gender and human rights were identified by 9% of women and 8% of men as an important topic for capacity building.

In terms of interest in gender training, the in-depth study revealed that women (and possibly also men) did not have sufficient understanding of what training in gender and human rights would entail; women asked for clarification and explained the topic was a new to them. This might explain the low interest in the topic.

In addition to mining related training needs identified during the training, 11 women also voiced their interest in training in supplementary income opportunities such as tailoring, planting vegetables and hairdressing. The interest in alternative income sources was mainly linked to the fact that mining only provides seasonal income, which does not provide sufficient annual income. In addition, some women miners do not want to leave their children behind they move temporarily to the mine site. This underlines the importance of aligning the work-life balance of artisanal miners.

A female leader from a civil society NGO brought up the issue of increasing domestic violence cases and that family law should be included in the training.

> *There is a need for training. Needed are trainings on improving youth participation and building capacities. Domestic violence cases are on the rise. Hence, a training on Family Law is needed. Whether we talk about ASGM or the society in general, after all there are families at the core of both. We need to talk about family environment and what is meant by having a caring atmosphere in*

families. Trainings should not exceed 2 hours and should be carried out away from classrooms. You won't find a single person who would agree to sit in a lecture for 8 hours.

KII, female leader of civil society organization

Gender-based violence (GBV) is a sensitive topic and hence, was only covered to a limited extent in the interviews with mining communities (see section on challenges in ASGM). This KII interview, however, indicates that GBV is prevalent and an important topic that should be covered in the gender training.

A key stakeholder from the Human Rights Commission also pointed out that, while most regional and national government officials have received gender trainings, there is a need to train government officials at soum level, especially in remote soums. Since those government officials are often the first point of contact for miners, it is also important to strengthen gender capacity at this level in order to facilitate gender-sensitive planning in all activities.

In terms of training formats, experts suggested the development of tailored trainings for women, men and youth based on their specific needs, in addition to offering core ASGM content (Section 8.2).

Information sources

For the continuous provision of information regarding artisanal gold mining, Chapter 8.1 on information sources used by miners does not reveal any major differences in how women and men access information. The most important information sources on ASGM for women are TV (65%), Facebook (55%), phone (37%) and word of mouth (20%). Stakeholders in the mining business are the most important source of information for women (49%), followed by media (28%) and family and friends (26%), which is similar to men.

Occupational Health Risks

From the gender division of labour at the mining sites (Figure 6-7), it can be concluded that men are significantly more often involved in tasks that can lead to injuries and accidents, caused for example by heavy lifting or work in inadequately secured mine shafts. However, women are involved in ore extraction and processing – with regional variations depending on the level of organization and mechanization – and are hence, also susceptible to physical accidents and injuries. Subsequently, women miners identified during the in-depth interviews the following occupational health risks: working in cold weather during extended periods of time, joint and back problems, urological problems, respiratory problems and allergies.

Furthermore, women miners are more vulnerable to occupational health hazards during pregnancy. Three quarters (76%) of the women who participated in the survey are in their reproductive age (below 50 years). Risks associated with the sector include tasks such as heavy lifting, exposure to chemicals, access to health care for pre and postnatal check-ups as well as during a pregnancy related emergency. Asked whether they have ever worked at the mining site while pregnant, 17% of female respondents answered positively and 11 women out of these did not take any precautions. Precautions identified by others

included working less hours, strictly following safety and health advice, taking medicines and controlling blood pressure. Four women from the in-depth study reported health problems while working in the mining sector during pregnancy, without specifying the problems.

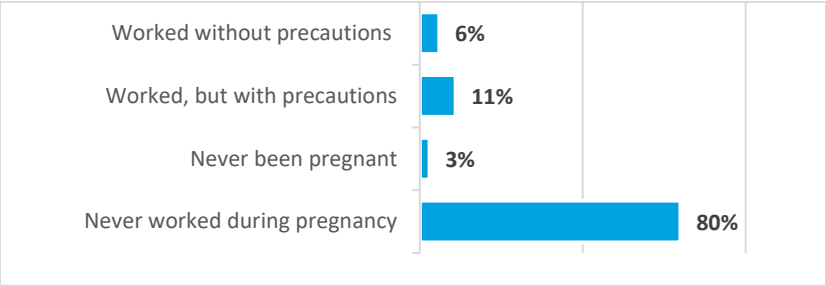


Figure 6-16. Work related safety precautions taken by female respondents during pregnancy (n=100)

A local government officer from Altai soum explained that many women miners would apply for social welfare when they get pregnant and hence, do not have to keep working at the mine site.

However, only 65% of all female respondents answered that they would pay social insurance on a regular basis, which is necessary to qualify for social welfare. There was no correlation between pregnancy precautions and social insurance coverage in our data set. In fact, those women who worked without precautions during pregnancy had indicated earlier that they pay social insurance on a regular basis.

Mercury Exposure

In artisanal gold mining, the use of mercury for gold extraction poses an additional challenge since exposure to elemental mercury vapours can lead to severe health implications for the mother and the unborn child. Since mercury use in Mongolia is illegal, this report can only estimate its prevalence based on various factors (Chapter 5). Participants of the in-depth study revealed that mercury use in Tunkhel, Bayangol and Mandal soums in Selenge aimag vanished after processing plants were introduced in their areas. Women in Altai soums, Khovd aimag, stated that there is still illicit use of mercury in Altai soum and adjacent soums, especially in hard rock mining.

Since respondents were reluctant or refused to reveal information on mercury use, it could not be assessed whether women or men are more frequently involved in processing steps including mercury (i.e., amalgamation and vaporization). Other studies have shown that women were more often involved than men in amalgamation at informal mine sites in Tuv Aimag (Navch, et al., 2006). While these patterns can change regionally, there is a tendency for women to perform amalgamation and vaporization since it requires no physical strength. In the study conducted by the Asia Foundation (2013), several ASGM leaders even confirmed that they have seen pregnant women handling mercury at formal and informal sites.

While exposure to elemental mercury vapours is toxic to all humans, women of childbearing age are more vulnerable, since mercury can readily pass between the blood-placenta barrier and cause neurodevelopmental toxicity in the developing fetus. The health effects caused by mercury in utero tend to be permanent and can cause developmental deficits such as language and motor skill deficits in children (AGC, 2020). Newborns, infants and children are also more susceptible to mercury exposure since their central organs are still developing. However, the survey was not able to collect data which would indicate the presence of women of childbearing age, infants and children during the processing steps involving mercury, especially vaporization.

Use of Personal Protective Equipment

In terms of general safety precautions at the mining site (see Section 4.2), female and male respondents reported similar compliance levels for the use of personal protective equipment (PPE) (56% and 58%, respectively). The relative number of women miners who have participated in occupational health and safety training was higher compared to men miners (64% and 57%, respectively); and this also applied to the self-assessed compliance with OHS standards at the mining site (61% and 58%, respectively). Local authorities confirmed the tendency of women miners to be more compliant with OHS standards; hence, training women in OHS standards and the development of OHS safety plans can offer the opportunity to train women as change agents for healthier and safer mining practices.

Challenges and Opportunities for Women in ASGM

The artisanal mining sector in Mongolia poses gender-specific challenges for women miners, but also offers many opportunities. Since gender is a sensitive topic, gender-specific challenges and opportunities for women were mainly addressed in the in-depth study. Due to COVID-19 safety procedures, it was not possible to conduct focus group discussions with women and men miners, as planned.

Challenges

During the survey, women and men miners were asked whether they perceive any of the social, economic or workplace related problems outlined in Table 6-3 at their mining sites or within their mining organizations. Overall, most respondents (66% of women and 59% of men) did not report any problems. The responses of women and men showed a similar pattern. However, especially socially sensitive problems such as violence, gender-based harassment and alcohol abuse are most likely to be underreported and have therefore also been addressed in the in-depth study (Table 6-3).

Table 6.2-3. Problems reported at the mining site, by study area and gender (multiple answers recorded, total= 490)

		Region					Total	
		Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=72)	Yusunbulag (n=62)	Altai (n=74)	Women (n=100)	Men (n=271)
No problems	No problems	56%	67%	65%	63%	50%	66%	59%
	Violence	8%	2%	0%	2%	8%	2%	4%

Social problems	Harassment (general)	6%	3%	1%	3%	5%	2%	4%
	Sexual harassment	2%	2%	1%	2%	1%	1%	2%
	Alcohol abuse	8%	4%	1%	10%	12%	4%	8%
	Crime	4%	4%	0%	2%	1%	2%	2%
	Discrimination	8%	3%	3%	6%	7%	4%	5%
Economic problems	Income insecurity	12%	15%	18%	13%	22%	16%	16%
	Unfair pay	12%	4%	13%	3%	11%	8%	8%
	Value of labour	12%	4%	4%	2%	4%	4%	5%
Workplace related problems	Workplace conditions	10%	10%	7%	13%	7%	9%	9%
	Exposure to chemicals	6%	4%	0%	0%	1%	2%	2%
	Safety at work	4%	6%	3%	10%	9%	7%	6%
	Others	4%	2%	3%	2%	0%	0%	3%

It is notable that more men than women reported violence, harassment, gender-based harassment, alcohol abuse and discrimination as prevalent problems. Since the question was open-ended to whether the respondent had been subject to any of the identified problems or whether these problems generally exist at the mining site, these quantitative findings do not allow the identification of gender-specific challenges for women miners.

The prevalence of problems by study area may indicate the magnitude of a problem on a local level; however, bias effects due to underreporting and the small sample size need to be considered for the analysis of findings. For example, while alcohol abuse was mentioned by at least one respondent at each study area, the maximum number of cases was reported in Altai (10%; n=9) and Yusunbulag (12%; n=6). General and sexual harassment as well as violence were reported by 19 respondents, mainly in Yusunbulag (8%, n=11) and Altai (6%, n=50).

Gender-Based Violence

Gender-based violence (GBV) is not limited to physical or sexual violence; it can also include words, gestures or other actions with the purpose to humiliate, control, deprive or harm another person because of their gender or gender identity. GBV can be exercised in many different forms such as physical, sexual, societal or economical abuse and it can be carried out in many different places such as public spaces, the workplace or at home (GAC, 2020). GBV at the mine site, or in other places, is a sensitive topic and difficult to address in a quantitative survey since participants tend to prefer not to disclose sensitive information in a formal interview setting. Reports on gender issues in Mongolia indicate that GBV is widely prevalent in the general population. A report from NSO and the UN Population Fund (2018) for example found that 30% of women in Mongolia experienced physical violence and 20% economic violence (e.g., prohibiting women from getting a job or denying money for household expenses). In the general population, GBV is on the rise in Mongolia, including sexual harassment at the workplace. Therefore, GBV was also addressed in KII and in the in-depth study with 30 women miners. Even during the in-depth study, several women decided not to answer questions pertaining GBV.

One third of the respondents (n=10) mentioned that they have not seen or heard of GBV or domestic violence in places where they live, and 6 respondents decided not to answer the question. However, almost half of the respondents (n=14) have heard from or seen women face elements of GBV in their local area. Of those, 6 women had observed incidences at the mining site, whereas 8 women said that GBV would usually occur at home. Some key informants explained the low prevalence of GBV at mine sites by the fact that husband

and wife often work together, and that the presence of family members offers some protection. In fact, the number of unmarried, single, or divorced women in the survey was low.

However, while this might explain a lower prevalence of open GBV such as sexual harassment of women, this finding is not an indicator for the absence of GBV at the domestic level or the mine site.

The majority of women (n=18) expressed that excessive alcohol consumption is associated with GBV mainly at home, but also at the mine site; women stated that incidences of excessive drinking barely occurred at mine sites. However, other studies show that alcohol use at informal ASM sites is high (Asia Foundation, 2013). Excessive drinking at the soum level was mainly linked to lack of income and poverty in Altai and Yusunbulag soum. As observed by some interviewers from the project team, debt, lack of job opportunities at the soum level, no access to mining land and the economic impact of COVID-19 on local businesses has led to frustration and behavioral changes among communities in soums. This has resulted in a rise in violence. As well, this finding underlines the importance of ASGM as an important income source among local communities, as it helps to improve livelihoods and reduce poverty-related violence. Women suggested that informing the police would also be a solution.

To eliminate GBV, women suggested socializing relevant communities and organizing trainings for both men and women miners, covering topics such as human psychology and behaviour (i.e., gender identity and behaviour) and family development. In fact, the ASM NF organized a group training on GBV in 2019. According to an official, the training was productive, because women miners gained knowledge on GBV. For instance, the women miners learned that verbal abuse and touching a woman's body without consent counts as GBV. After gaining new knowledge related to GBV, some women miners acknowledged that they had to defend themselves. Some of them also realized that they should receive benefits in case their husbands divorced them, and thus applied for them.

While these findings do not confirm that GBV is more prevalent in the ASGM sector in Mongolia than in the general population, they show that women can be more vulnerable if artisanal mining is poverty driven. The Asia Foundation (2013) came to a similar conclusion that GBV in ASM is low and often related to alcohol consumption, however there is very little data, and it can be assumed that women are at risk of domestic violence.

Opportunities

Women were asked during the in-depth study to identify opportunities for women to work in the ASGM sector. Almost all interviewed women miners (27 out of 30 women) identified advantages to working in the sector. One of the major opportunities identified included the possibility of women to be involved in the management of ASGM organizations due to women's better organizational skillsets – compared to most men (12 out of 30 women). The survey also identified that women have a better knowledge of legislative frameworks and permitting processes. Moreover, based on some women's feedback, women miners tend to follow occupational health and safety regulations and work more cautiously than men miners at mining sites. The existing knowledge, skill sets and interest in capacity building

among women miners offers a great opportunity to empower women to serve as change agents for formalization and better mining practices, including due diligence compliance, in the sector.

Furthermore, 10 out of 30 women stated better income opportunities in ASGM compared to other jobs available for women, as well as the opportunity to work in a position with decision-making powers such as financial management (8 out of 30 women).

> *"In my understanding, working in ASGM gives me the opportunity to earn more salary than working in other jobs. For example, I used to work as a teacher at one of the local colleges and I needed money (5,000,000 MNT) to let my daughter attend an international tennis contest in 2015. Because my daughter should have deposited 5,000,000 MNT into a bank account as a price fund to attend that contest. However, I didn't have such an amount of money, so I decided to join a group of people who go for gold. As a result, I was able to collect the money for my daughter within a month, which was a big opportunity for us."*
>
> **In-depth study, women miner, Khovd aimag**

Few interviewed women miners responded that women working in the sector also have the advantage of access to training for personal development, or the option to approach local authorities to report and seek support for solving their problems. This opportunity only exists for women working in formalized organizations. This indicates that the formalization of an ASGM organization is an important prerequisite to obtaining support from local authorities. More research is required to understand in how far women miners have been reaching out to local authorities to seek support for gender-related issues, and in how far local authorities are currently able to provide gender-specific support. Overall, the qualitative survey participants noted that formalization of the artisanal mining sector has provided women and men with the opportunity to have reliable and secure jobs in the industry.

However, with the formalization of the ASGM sector, there is also a need for the development of a more favorable work environment for women and men miners. This will allow more women miners to take on leading roles or tackle the problem of a double burden of work (Section 6.3) which many women are facing at the moment. A senior officer with the MMHI explained that the government responded to these challenges by approving the "Gender-responsive policy in the geology, mining, petroleum and heavy industry sectors (2019-2026)". Although the initiative primarily targets issues surrounding large mining operations, such as 14-day work rosters and family separation, some aspects are also relevant for the ASGM sector. The policy targets the implementation of *""special measures" and other activities in various forms to enable an environment that addresses gender-specific needs adequately in all levels of public and private spheres in the extractive sector; ensure work-life balance of all employees in the sector; ensure equitable participation and representation of women and men on management levels across the sector, including in ministries, agencies, government offices, and in business entities and organizations; and ensure equal distribution of benefits to men and women in all spheres.*" (MMHI, 2019).

In order to find adequate measures to implement this policy in the ASM sector, more capacity building might be required for local government officials to facilitate gender-responsive interventions. According to information from KII, the MMHI together with the

Women in Mineral Sector Mongolia, NGO is planning to conduct training on the main gender concepts, gender-sensitive policy, and gender-sensitive budgeting.

6.3 Gender Dynamics in the Domestic Sphere

While the survey mainly focused on the occupational or productive sphere and its gender dynamics, the survey also captured two aspects of the domestic sphere: the gender division of household chores and decision-making powers at the household level. Since artisanal miners often work together with family members, power dynamics and workload at the household level can also impact gender dynamics at the mining site.

Gender Division of Domestic Labour

The "Time Use Survey" conducted by the National Statistics Office in 2015 revealed that women spend an average of 203 minutes and men 69 minutes per day on housework, indicating that most of the domestic work in Mongolia is performed by women. Rural women tend to spend more time on unpaid domestic work, including caring for children and the elderly. Results from the survey showed that women spend on average 35 hours per week on household chores (5 hours per day) and men 27 hours per week (almost 4 hours per day). However, compared with data from the Time Use Survey, this data might be biased due to overreporting of hours, especially among men. Figure 6-17 shows that one in 10 male respondents (21%) spent less than ten hours per week on household chores. The distribution of tasks (Figure 6-18) also indicates that weekly work hours on household chores was overreported by male respondents.

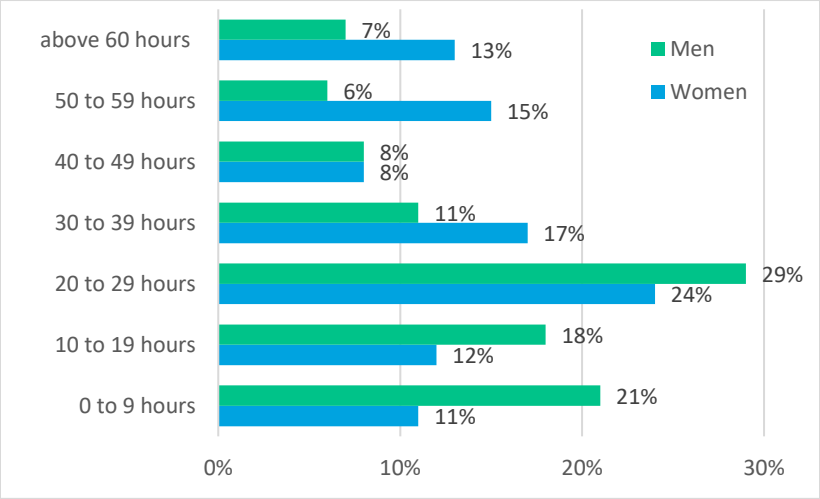


Figure 6-18. Participation in domestic chores at home and time spent (per week), by gender (n= 100 women, 271 men)

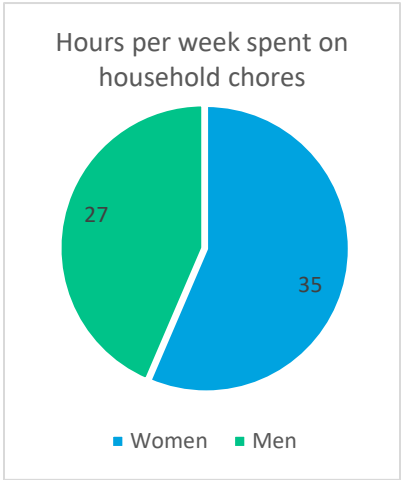


Figure 6-17. Time spent for participation in domestic chores

Figure 6-19 shows that women bear the main responsibility for most domestic chores, especially cooking, laundry, cleaning (≥ 92%), caring for children and the elderly (≥ 56%), whereas men are mainly responsible for chores outside the house (i.e. collecting water, firewood and coal (> 79%)).

The contribution of men miners to household chores might be strongly influenced by industry specifics, such as work shifts lasting for 8-9 hours as reported by the survey participants. However, the average working days in a week and daily work hours spent by women and men miners in artisanal mining did not differ significantly and was only slightly higher among men (Table 6-1).

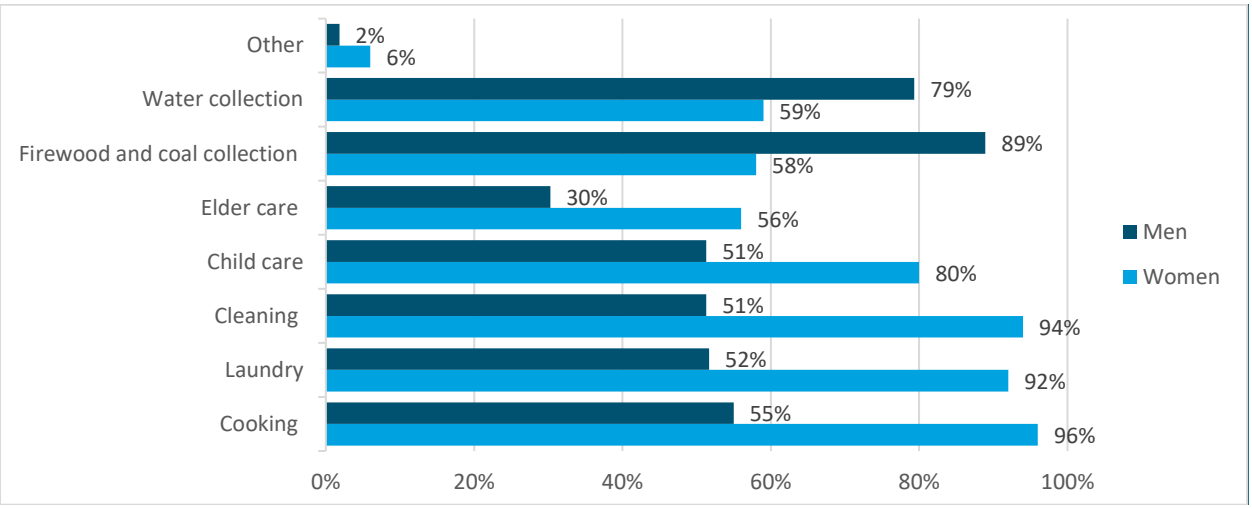


Figure 6-19: Gender division of domestic labor (n= 100 women, 271 men; multiple answers recorded, total=1,651)

Overall, the data indicates that while men are contributing to different household duties, women are still affected by a traditional gender division of domestic labour, causing longer workdays for women. The double work burden consisting of productive and reproductive work can cause physical exhaustion and stress in women. The higher workload also needs to be considered when planning training activities for mining communities to ensure that women have time to participate.

Gender Division of Decision-Making

The decision-making process within a household impacts the gender dynamic within a family; these dynamics at the domestic level can also impact gender dynamics at the mining site. For example, gender dynamics in decision-making or social norms impact how women and men's roles are judged. Factors such as who contributes to the family income, age, education, marital status, and presence or absence of children can influence the level of gender equality within a household.

Within the survey, respondents were asked to identify the person usually in-charge of decisions related to major household expenses, daily household purchases and visits to relatives. The objective was to measure women's and men's roles in decision-making at the household level. This household decision-making scale has been used with women and men in 12 countries (C-Change, 2011).

Table 6-4 shows that decisions about major household expenses are mainly made by several household members (60%), but in 25% of all cases by the husband alone. If the man is considered to be the main bread winner within a household, then procurement of

significant assets tends to be made by the man. This raises the probability that ownership belongs to men.

Decisions about daily household purchases such as groceries are usually done by women (66% of all respondents). Since women are mainly in charge of household chores such as cooking and cleaning, this is not surprising and though it indicates some autonomy about daily household items, it does not indicate greater decision-making powers than men. It can rather be linked to a persisting patriarchal culture and traditions in which women are in charge of daily household chores and are responsible for the procurement of food and supplies. Decisions about family visits were again mainly made by husband and wife or several family members (59%).

Table 6.3-4. Key decision makers within the household among married respondents, by gender and total

	Women (n=87)	Men (n=211)	Total (n=298)
Who usually makes decisions about major household expenses (e.g., car, housing, livestock)?			
I decide alone	17%	24%	22%
My spouse decides	22%	12%	15%
I decide with my spouse	56%	62%	60%
I decide together with other family members	5%	2%	3%
Who usually makes decisions about daily household purchases (e.g., groceries, clothes)?			
I decide alone	71%	7%	26%
My spouse decides	11%	64%	48%
I decide with my spouse	15%	26%	22%
I decide together with other family members	2%	4%	3%
Who usually makes decisions about visits to relatives?			
I decide alone	32%	15%	20%
My spouse decides	8%	23%	19%
I decide with my spouse	57%	60%	59%
I decide together with other family members	2%	2%	2%

The findings of the in-depth study confirm these decision-making practices. The majority of respondents (17 out of 30 women) agreed that they had mutual discussions with their spouses when making household related decisions. Seven women expressed that women miners usually have leading roles in the management of family issues, whereas five women stated that men dominate decisions at home. These findings are in line with other reports on gender roles in Mongolia and also in ASM that state that women do not have equal or dominant decision-making powers at the household level, but also bear the majority of household chores (Asia Foundation, 2013). Therefore, decision-making powers at the household level are not necessarily a direct indicator for gender equality within the household. However, control over the household can also be an empowering factor, as the quote from a respondent from Tunkhel village describes:

> *"In my opinion, the women have more leading roles within the household than men. I think we usually follow a matriarchal pattern within the household in our community. For example, I am responsible for spending and managing the family budget and my husband agrees to this. I also know many women who have similar family tasks as me and participate more powerfully in decision-making within the household in our areas."*
>
> **In-depth study, women miner, Selenge aimag**

As concluded from the above points, women in Mongolia tend to have leading roles in decision-making and arranging domestic or family issues within the household but are also responsible for the majority of the household chores, causing a double work burden.

6.4 Conclusion

Gender Division of Tasks

The study shows that women constitute around 30% of the workforce in the artisanal gold mining sector, with similar working hours though women tend to work slightly less hours and more seasonally.

Findings from the qualitative and quantitative data show that the distribution of tasks within artisanal mining organizations shows a strong gender-related distribution of tasks, with men doing most of the hard labour (ore extraction and processing) and women – though also involved in physical work such as bagging ore – are mainly involved in supportive services such as cooking and administrative roles. However, the study also found regional differences. In Western aimags (Yusunbulag and Altai soum) where adherence to traditional cultural norms is prominent, men were still more involved in several of the managerial decisions such as securing finance, purchasing equipment or selling gold.

Both women and men miners provided reasons for the gendered division of labour by stating that women have better management skills and should not engage in heavy physical work. Overall, there seems to be a belief among women and men miners that women should not be involved in dangerous tasks such as work in shafts and tasks requiring heavy lifting, for protective reasons rather than discriminatory ones that would cause economic disadvantages for women (e.g., restrict their access to resources. The finding that income is mostly shared equally among women and men – independent of their tasks within the group – supports this assumption.

Power Dynamics and Decision-Making

Though the share of women involved in decision-making within mining organizations is lower compared to that of men (88% versus 95%); men tend to dominate decision-making in mining operations, while both men and women enjoy similar rights for financial and administrative decisions. This is based off of respondents that reported making mutual decisions within mining organizations, although it is also not uncommon for men or women to dominate decision-making in some organizations.

The analyses of roles and responsibilities of men and women in the artisanal mining sector show that there are relatively more women leaders of partnerships and heads of ASM NGOs in all target soums, except for Altai soum of Khovd aimag. KII data also confirmed that ASGM NGOs in particular, tend to be headed by a woman. However, the majority of respondents (42%) prefer a male leader, 37% are gender neutral and 22% prefer a female leader; target areas with a higher number of female leaders view female leadership more favourably. The reversed gender gradient in education, (i.e. women having a higher level

of education, and women's involvement in management and legal compliance) provide favourable conditions for female leadership in Mongolia.

Access to and Use of Resources

Qualitative and quantitative data did not reveal any major differences or inequalities between men and women in access to resources such as the distribution of income, access to finance or control over means of production. However, it is also important to understand that the majority of miners cannot live from artisanal mining alone and are dependent on other income sources.

While survey data and the in-depth study show no income inequality, government officials, human rights experts and the leaders of the ASM NF stated that differences in the gender division of labor and power allocation between men and women miners can constitute a reason for an unequal distribution of both wages and profits. Hence, results from the study areas cannot be generalized for the sector in Mongolia.

Access to Information and Capacity Building

Female respondents in the study areas have participated more often than men in training over the last two years; key stakeholders indicated that women are more active in participating in capacity building. In fact, key stakeholders highlighted the need to increase gender equity by involving more men miners in training. A gender-specific analysis of the training completed by respondents revealed that women were more actively participating in all training topics covered by the survey, including technical, legal and business-related trainings.

Women were mainly interested in formalization, responsible and better mining practices, as well as technology; the interest in gender and human rights training was low; but the in-depth study revealed that this was due to a lack of knowledge about the subject. Similarly, key stakeholders identified different training priorities for women and men than the respondents themselves. The top three priorities being: risks and harms of using mercury, legal frameworks and occupational health and safety. A female leader also voiced the need for training on domestic violence.

To increase quality and efficiency of trainings, a local stakeholder suggested designing training programmes differently for men and women in terms of methodologies, taking into account the specifics of men's and women's work at mines and the fact that women participate more actively in capacity building workshops.

Both quantitative and qualitative survey results revealed that different organizations are currently involved in providing training for miners, with the National Federation for ASM being the most important player. NGO experts advised that training should be participatory, short-term (less than 8 hours, two to four hours max.) and conducted not in a classroom setting but at active work sites. Trainings should also be tailored for women, men and youth based on their specific needs in addition to offering core ASGM content.

Gender-Based Violence

According to the quantitative and qualitative findings, the prevalence of gender-based violence seems to be low within artisanal mining organizations, though it can occur. Work in family units and in formalized sites where alcohol is banned seem to be protective factors. During the in-depth interview, domestic violence – especially in combination with alcohol abuse – was problematized by the respondents. This, however, does not seem to be a sector specific problem, but rather linked to overall social changes within the Mongolian context.

Gender Division of Labour in the Domestic Sphere

Both qualitative and quantitative survey results show that women are bearing the major burden of domestic chores, despite similar work hours spent in artisanal mining. This is leading to a double burden of work for many women, though men are usually willing to help out with different tasks and are for example responsible for collecting water or firewood. At the same time, women are mainly in charge of decisions for daily household purchases. Less participation of men in daily decision-making in families based on sentiments that "men have little interest in economically non-significant purchases" and "women are in charge of daily home chores" reinforce gender stereotypes in labor division. Lower involvement of men in decision-making regarding families' daily consumption present them with difficulties in understanding the different needs of family members, including children, and recognizing the domestic responsibilities of women. This lack of understanding can impede activities related to negotiating a fair decision-making process and ensuring a work-life balance for women and men. However, the survey also reveals that decisions regarding major household expenses usually include both spouses.

Gender Dynamics in Artisanal Mining

Gender dynamics were mainly characterized by respondents as being neutral; while there is a gender division of labour at the mining site, sharing of benefits and decision-making seem to be gender equitable within many mining organizations. The gender mapping also showed that women have been able to profit more from capacity building than men, and that women are using their education, work knowledge and skills to fulfill administrative tasks which also lead to more engagement in decision-making. Access to decision-making and leadership seems to be determined more by skills than by gender. The existing knowledge, skill sets and interest in capacity building among women miners offer a great opportunity to empower women to serve as change agents for formalization and better mining practices, including environmental performance, OHS and gender equality, in the sector.

However, not all women have the same access to these positions and many women are only involved in auxiliary services. More research is required to understand which factors lead to differences in status among women in mining organizations: the sample size was too small and the topic too sensitive to draw conclusions based on the data set, in how far

for example education or status within the organization cause higher levels of gender-based discrimination in the sector.

Women also face challenges, which seems less linked to contextual factors in the artisanal mining sector but cultural factors that lead to a double work burden of women and an increased exposure to gender-based violence at home. Alcohol and poverty were identified as major drivers.

Overall, the artisanal gold sector offers a viable livelihood option for women due to flexible work hours, equal pay and the possibility to strengthen their leadership position (Asia Foundation 2013). Formalization can improve the situation of women miners since it mitigates some of the risks that are inherent in the informal sector.

7. Gold Trade and Supply Chain

Gold trading policy and practice can play a critical role in formalizing the ASGM sector in Mongolia. Artisanal gold supply chains, when operating efficiently, can act as an effective mechanism to transfer resources, capital, standards and regulations into artisanal mining communities, leading to improved mining practices (Chapter 4) and legal compliance (Chapter 3). The contextual study questionnaire included many questions related to the gold trade, the ASGM supply chains and access of miners to finance and investment. The content of this section has focused primarily on reporting and analyzing the results from the surveys in the mining communities. Analysis of the broader gold trading policy and practice will be elaborated on in the framework report. This is part of the broader policy framework analyzing the ASGM sector in Mongolia. A brief overview of the Mongolian state gold buying program and regulations is provided for context.

7.1 Regulatory Context on Gold Trade in Mongolia

Mongolia manages a state gold buying programme where the entire formal gold supply chain is regulated by the Mongolian Government. The BoM is the only entity authorized to export gold. This implies that all domestic formal sales of gold from ASGM sites should comply with the state gold trading regulations and be sold into these formal channels. Artisanal miners can sell gold formally either to a state accredited gold trader or directly to the BoM through their gold buying centres or via an authorized commercial bank.

All gold sold to the BoM must include an official assay report. Previously, this had to be issued by the Precious Metals Assay Inspection Department (PMAID). In January 2020, the BoM re-drafted the Treasury Fund Law, to allow assay results not only from PMAID, but from other private laboratories, and the BoM is enabled to establish assay laboratories on its own, without assistance or involvement from the PMAID (Government of Mongolia, 2020). When this draft Law is approved, it will be a significant step for Mongolia in gold trade decentralization.

Most artisanal miners lack the time and resources to bring gold to the formal, centralized market and therefore deal with local and regional gold traders at the soum and aimag levels. These traders play an important role as they finance the purchase of smaller quantities of gold from artisanal miners and processing plants, then aggregating the gold into larger volumes for transporting and selling either formally to the BoM's official gold buying facilities, to larger traders in Ulaanbaatar (most of them residing in area called "Urt Tsagaan") to goldsmiths or informally to smugglers/exporters (Figure 7-1) (UNIDO, 2017).

One of the first attempts to decentralize and formalize the gold trade was made in 2018, when two One-Stop-Shops (OSS) centers[22] for gold assay and purchasing were established in Darkhan-Uul and Bayankhongor provinces by the funding of the BoM, PMAID and the

[22] One-Stop-Shop (OSS) centers were introduced in Mongolia in 2007 and have been implemented nation-wide since 2013. The centers provide different services, including banking services, at the aimag and soum level (ILO, 2016).

Swiss Agency for Development and Cooperation (SDC), which was an important step in decentralizing gold trade. However, according to the project studies, the operation and requirements of OSS need improvement and change.

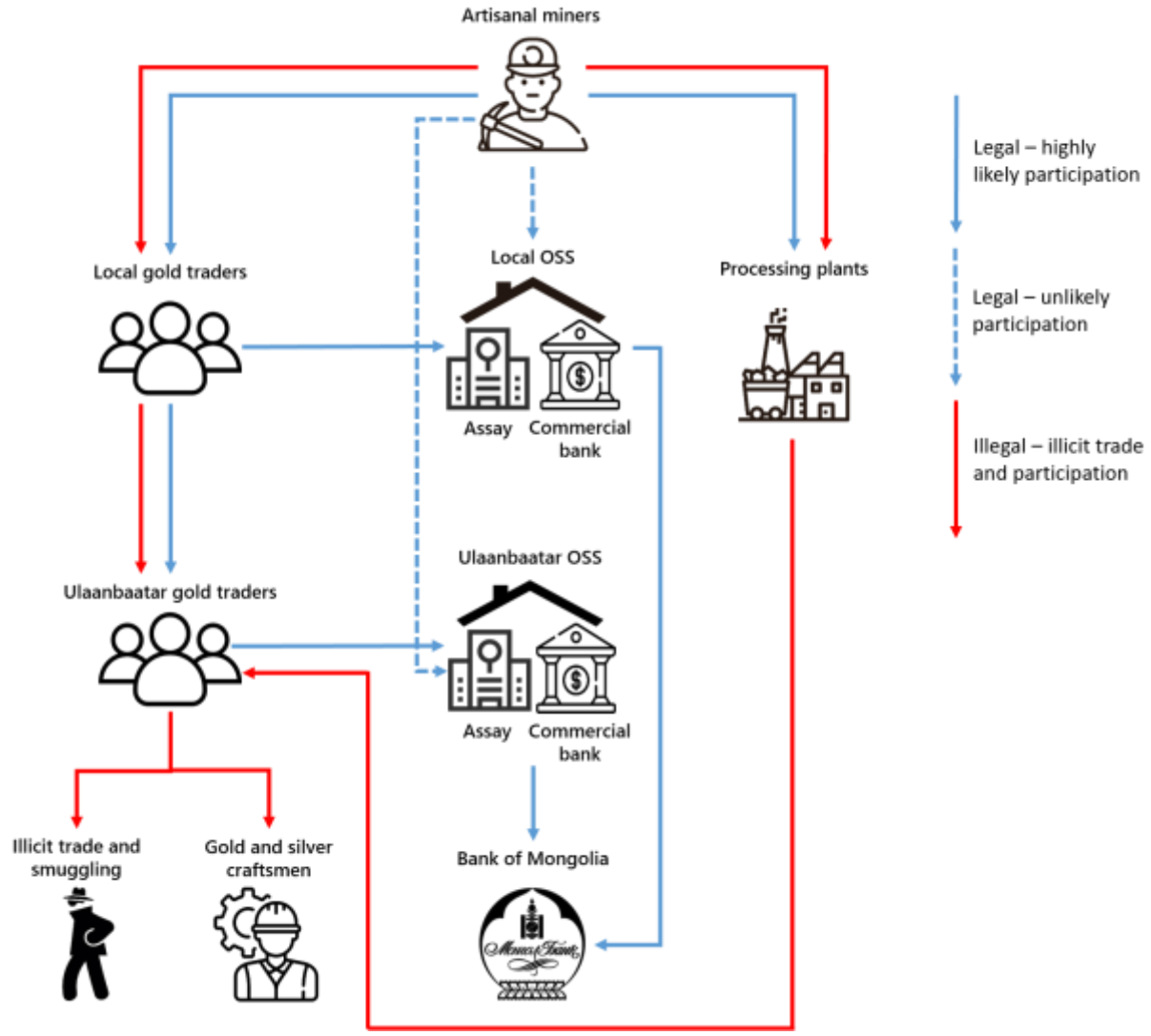


Figure 7-1. Visual of ASGM supply chains (planetGOLD Mongolia, 2021)

Until 2020, the traders were not regulated nor accredited. Mongolia was put on the Financial Action Task Force (FATF) "Grey List" in October 2019 over its ineffective operations on several issues, including detecting, confiscating, and checking the origin of gold, precious items and cash taken over the border. To be removed from the "list", the Government made several efforts by enacting new regulations on formalizing gold trading. Based on the new amendments to the Law on the Legal Status of FRC and the Law on Special Licenses, the Financial Regulatory Commission (FRC) is a government agency to issue licenses to gold traders to formalize their activities and regulate activities regarding the implementation of the Law on Combating Money Laundering and Terrorism Financing (2013) . The Financial Regulatory Commission through Resolution No.150 of March 2020, approved the "Procedure for licensing, permitting and registration of traders of precious metals, precious stones or items made of them" effectively paving the way for

many gold traders to secure legal status. (FRC, 2020). As of December 31st, 2020, a total of 30 legal entities and 399 citizens received licenses (FRC, 2020). As a result, more local gold traders are expected to become formalized, gold trade is expected to become more transparent, and the record of gold trade in local markets will be more extensive. When trading gold without a permit, actors will be held accountable under law. According to KIIs with traders, small gold traders do not have sufficient information about the above new regulation from the FRC. This may be due to the fact that the licensing process is in its initial implementation period.

7.2 Gold Trade in the Study Areas

In order to analyze the context of the gold trade and gold supply chains from an ASGM perspective, the analysis of the data was structured into the following key points:

1. How do artisanal miners typically process and sell their gold, such as average volume of gold they sell and how frequently?
2. What are miners' options for selling gold locally: to whom, formal or informal, how competitive is the local market, and power dynamics?
3. Does the Mongolian state gold buying program provide adequate conditions that facilitate the purchasing of ASM gold and incentivize miners to sell formally?

These issues should facilitate an educated evaluation of the key criteria miners in Mongolia take into consideration when deciding how and to whom they sell their gold. The data should also permit an evaluation of whether the current market conditions provide incentives for selling formally or informally, and how these are connected with identifying needs for improvements to current formal gold trading policy and practice.

Average Gold Production and Trading Volumes

From a total of 371 respondents, on average, respondents indicated their mining operations produced 52 grams per week. Estimating 4 weeks of operation per month, this would give an average monthly production of 208 grams.

In comparison, when asked how much gold they sell per week/ month/ season/ yearly, the average responses were 28 grams per week, 92 grams per month, and 229 grams annually. There is a large difference between the volume of gold produced in a week, 52 grams, compared to the volume of gold sold per week, 28 grams. This speaks to the accuracy of the responses provided in relation to gold trading. However, it also needs to be considered that gold production can vary depending on various factors and that the estimation of an average weekly gold production therefore has methodological limitations.

Table 7.2-1. Average gold sales (in grams) per week, month and year, by study area and total

	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusunbulag (n=62)	Altai (n=74)	Total (n=371)
Per week	**32**	**26**	**34**	**20**	**28**	**28**
Per month	**90**	**98**	**88**	**57**	**116**	**92**
Per year	**220**	**259**	**221**	**146**	**265**	**229**

The average operation has 12 members with 9 being active and the average monthly income from mining according to the survey is 980 163 MNT (see also Sections 2.3 and 6.1 on ASGM income). Using the miner's average income as a calculator for their average production of gold would suggest that an operation of 9 miners would need to produce a surplus of 242 grams of gold per month[23]. This is significantly higher than the average response from the survey of 208 grams produced per month and 92 grams sold per month. This does not take into account the grams of gold extracted to cover operating expenses. As expected, this indicates that miners have under reported their gold production and sales, a typical and understandable attitude to this type of survey for such sensitive information.

It is important to recognize that the accuracy of the gold production and trading volumes from respondents will vary from reality. This is sensitive information and respondents will have many justifications for obfuscating this data. Case in point is a mine owner from Yusunbulag who responded that from each batch of processing, they extract 1,500 grams of gold, yet they responded that their weekly gold production is 20 grams, and their weekly gold sales are only 15 grams. Cross-checking and calculating estimated volumes based on the number of miners, number of ore sacs, volumes of processing batches, grades of ores and other related data for ore and gold production can provide a more accurate predictor of actual gold volumes, in comparison to the direct questions of 'How much gold do you produce in a week?' and 'How much gold do you sell in a week?'. However, considering that the reported data for these variables have their limitations and are incomplete, this report refrains from this exercise.

Local gold trade in Altai soum, Khovd province (photo taken by planetGOLD Mongolia)

Key Findings Per Study Area

The table below summarizes the regional gold trade information collected by the surveys across five study areas.

Table 7.2-2. Summary Table of Regional Gold Trading Surveys

	All respondents					Mine owners w/ trade experience				
	Bayan gol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusun bulag (n=62)	Altai (n=74)	Bayan gol (n=5)	Mandal (n=11)	Tunkhel (n=5)	Yusun bulag (n=8)	Altai (n=7)
Do you register and make record of the gold sold?	19%	27%	35%	21%	14%	100%	45%	80%	75%	14%

[23] At USD-MNT: 2,856.81 = roughly $343 USD per month. If we estimate an average gold price of $60/gram, with miners receiving 85% of the market price: $60*85% = $51/gram. Monthly income of $343 USD in gold would be roughly 6.73 grams.

On average, how much gold does your partnership produce in a week? (grams) (average)	51	39	53	44	37	241	32	53	95	46
How much gold do you sell per week? (grams) (average)	32	26	34	20	28	154	28	53	29	40
How many times a month do you process your ore? (average)	4	4	3	3	6	3	4	3	6	6
Assay with water density	29%	23%	90%	77%	8%	33%	55%	100%	75%	29%
Don't assay and trust the trader	38%	38%	7%	16%	53%	0%	18%	0%	0%	71%
How do you know the gold price: only gold buyer	46%	34%	17%	63%	74%	0%	20%	60%	25%	43%
How do you know gold price: BoM	13%	13%	6%	5%	9%	33%	27%	40%	13%	14%

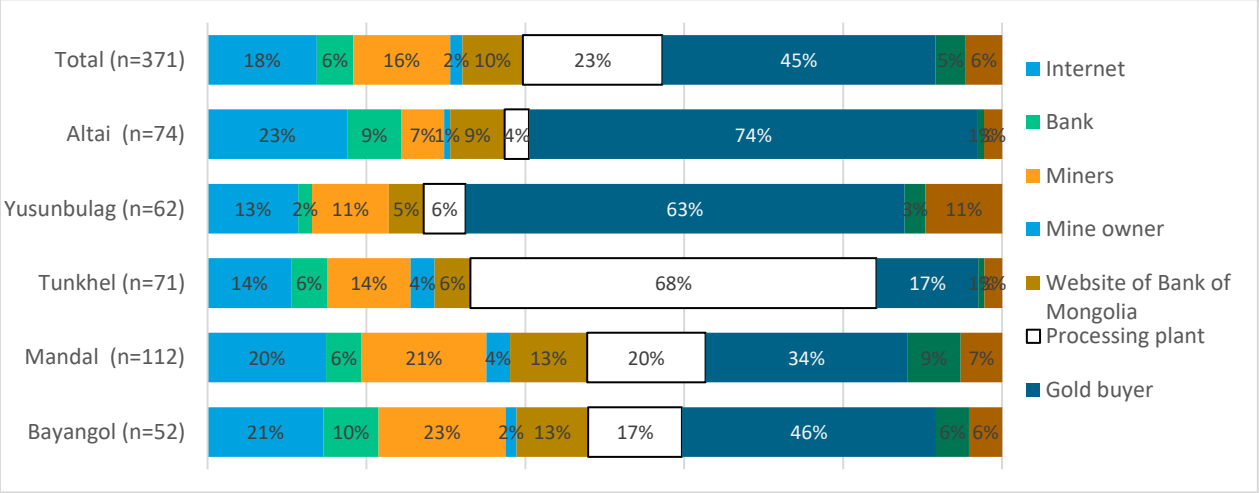


Figure 7-2. Sources for gold price information, by research area (multiple answers recorded, total=488)

Tunkhel

The processing plant in Tunkhel plays a central role in the gold trade in the area. All of the five mine owners responded they only sell to the processing plants and that it is their only trading option. On average, they process their ore three times a month, producing and selling an average of 53 grams per week (Table 7.2-2). Dependence on the processing plants for the gold trade reduces the miners' negotiating power and places them at a disadvantage. None of the respondents mentioned the BoM as an option for selling. In addition, because the miners only sell to the plants, 68% (highest percent compared to other regions) of them said that they rely on the plant to get the latest gold price information (Figure 7-2).

If the gold from Tunkhel is to enter formal supply chains, it is dependent on the processing plant owners. Tunkhel is a prime example of why Mongolian authorities should place special attention on regulating the processing plants and incentivizing them to sell to the BoM (see Chapter 9, Recommendations).

Altai

The seven local mine operation owners interviewed responded that they produce on average 46 grams, and sell 40 grams of gold per week, and process their ores an average of six times a month. Altai does not have any formalized and complete processing plants. There are only a few small milling and crushing operations. With the absence of processing plants, local soum gold traders are the main actors in the gold trade and the only option for miners to sell gold locally. Six of seven owners responded they only have the option of selling to a local trader. One of the owners also acts as a local trader and transports the gold to Ulaanbaatar to sell to the informal traders in Urt Tsagaan. This trader is aware that the BoM also purchases gold in Ulaanbaatar, but said the prices offered in the informal market are more attractive.

The miners in the region do not have a culture of assaying their ores to determine gold purity before selling them, thus placing them at a disadvantage and exposing them to potential arbitration from their trading partners. Only 8% of all respondents interviewed in Altai use the water density method and 53% sell their gold without any prior assaying, trusting the local trader and using historical purity averages. Also concerning is that 43% of the operation owners and 61% of the miners do not check the gold price with any external reference and 74% of the miners rely solely on the price quoted by the buyers. Without knowing their gold purity or the market gold price, they are exposed to considerable risk of traders offering lower than market value for their gold.

Mandal

The average gold production per week is 32 grams and the average gold sales are 28 grams per week, with miners processing their minerals an average of 4 times per month.

Miners in this region seem more informed and educated on gold trading practices, as only 18% of mine owners rely on trusting their trading partner's assay results and only 20% rely solely on the buyer's gold market price quote. 27% of owners refer to the BoM gold price quotes but none of them sell to the BoM, with 60% stating it being too far away as the reason.

Of all the regions, Mandal had the most diverse options for gold trading and the least dependence on one trading partner, with only 55% being dependent on one trading partner. Processing plant owners play a smaller role in the gold trade, although 36% of all mine owners still name them as their primary trading partner. As for sources of gold price information, miners in Mandal also emphasized that they approach different sources, such as the trader (34%), the internet (20%), plants (20%) and other miners (21%).

Yusunbulag

Average gold production is 92 grams per week, average sales of 29 grams per week and the miners in the area process their ores an average of 6 times a month.

The gold trading options seem limited as 63% of the mine owners only named one type of available buyer, with 50% indicating the processing plant and 38% an aimag trader (Table 7.2-3). During the planetGOLD field visit, the main processing plant in Yusunbulag also managed the trading operation. As the respondents did not name the trader, it is likely that the aimag trader and processing plant are the same, which would mean that miners only have one option for selling their gold to the processing plant. Having limited market options greatly reduces miners negotiating power and creates dependency risks. The processing plant owner from Yusunbulag expressed a commitment to formalizing both artisanal mining operations in the region and formalizing the gold trade.

In terms of gold price, the issue in Yusunbulag seems to be location and distance logistics, rather than a lack of knowledge of the gold market. Five Yusunbulag operation owners indicated an awareness of different selling options; an aimag trader, a soum trader, Ulaanbaatar gold traders, Urt Tsagaan gold traders, the BoM and a local goldsmith. Two of the five have indicated they have sold to the BoM in the past, and one indicating they usually sell to the BoM.

In comparison to the other regions, the miners are diligent in assaying their gold before selling, which is a recommended practice. A total of 77% of the miners in the region use the water density method. Only 16% of total respondents do not assay their gold before selling. On the other hand, 63% of the total and 25% of owners do not check the gold price with any external references and trust the price given by the buyer. A simple check on their smartphone before selling would allow them to be better informed to negotiate a price with the buyers. Only 5% indicated that they look up the BoM prices.

Bayangol

The average gold production per week is 241 grams, the average gold sales are 154 grams per week, and the miners process their mineral an average of 3-4 times per month. This is the highest amount of gold mentioned by mine owners, compared to numbers from other regions.

38% of total respondents trust the gold trader's assay results and 46% rely on the buyer's price, 21% look up the prices from the internet and 23% ask other miners, when none of the owner's trust the buyer's price, or their assaying. 33% of the owners check the gold price from BoM sources. Compared to other regions, all owners from Bayangol answered that they make records of the gold sold. The reason might be, as indicated in the previous Chapters, is because this is one of the regions where the ASM activities in Mongolia started and the miners here are more experienced. The miners only have two places, where they sell their gold, one usual local buyer or the aimag trader, because there are no processing plants in this area, just individual mills and crushers.

Barriers to Better and Formal Trade Options

The average volumes of gold being sold are estimated to be less than 50 grams, which is the minimum requirement for official assay for selling to the BoM. This minimum volume for assaying will remain a key barrier restricting miners' ability to sell directly to the BoM.

The survey questionnaire did not include questions on the payment methods but from our extended field visits, almost 100% of all gold trades are done via an immediate cash or bank transfer payment. The BoM's delays in paying miners due to slow assaying methods is a major barrier for artisanal miners choosing to sell to the BoM. Again, using authorized traders as aggregators can partially work around this issue, but the slow payments will also be a deterrent to the traders, albeit perhaps not as restrictive as it is to miners.

A lack of diversified trading options is a current weakness in the local gold buying markets in the key ASGM regions of Mongolia. In Yusunbulag, Tunkhel and Khovd miners were dependent on only one buyer or one type of buyer. This results in a relatively uncompetitive market, which creates dependence and reduces miners negotiating power with buyers. In Yusunbulag and Tunkhel, the processing plants dominate the local ASGM trade. This creates several issues, because miners are essentially obliged to sell their gold to the processing plant owners in exchange for using their facilities. First, this further skews the power dynamics between the miners and buyers, and second, it provides conditions for the plant operators to potentially exploit the miners if they so choose.

Table 7.2-3. Diversity of Local Market Trading Options indicated by mine owners w/ trade experience

Diversity of Local Market Trading Options	Bayangol (n=5)	Mandal (n=11)	Tunkhel (n=5)	Yusunbulag (n=8)	Altai (n=7)
Only have option of selling to one buyer	60%	**55%**	100%	63%	86%
Usually sell to the processing plant	0%	36%	100%	50%	0%
Usually sell to aimag trader	40%	55%	0%	38%	86%

The BoM's fixed gold price minus refining, assaying costs, and taxes is fairly competitive and attractive when compared to ASM gold prices around the globe. If these prices were more accessible to the miners, this would improve miners negotiating power and create more competitive gold buying conditions in the mining regions. Unfortunately, this is currently not the case. Also, the intermediary gold traders are openly negotiating the price paid to artisanal miners, so artisanal miners are not guaranteed to receive the full BoM price. It is unlikely they would receive the BoM price anyway, considering the logistics and financing costs related to the supply chain in these regions.

Under the existing legal environment, the BoM conducts inadequate due diligence on gold supplied and does not require traceability to the mine of origin. This is problematic for many reasons which are elaborated on in the "Assessment of the Legal and policy framework and Illicit financial flows in ASGM in Mongolia" report and should be a top priority for reforms to the formal gold trading policies and practices of Mongolia. The lack of documental traceability and due diligence practices has confounded determination of official statistics on artisanal and small-scale gold sales. Since none of the actors in the gold supply chain, such as the processing plants, soum or aimag traders, were able to measure

whether the ASM gold from these regions is being sold into formal or informal markets, it is difficult to know where this gold originated from and where it arrived.

Barriers to sell to the Bank of Mongolia

Of all 371 respondents, only 12 indicated the BoM was an option for selling their gold (Table 7.2-4).

Table 7.2-4. Overall experience with gold sales to BoM, disaggregated by gender

		Gender		Total (n=371)
		Women (n=100)	Men (n=271)	
Whether miners have sold gold to the Bank of Mongolia	Every time	3%	1%	2%
	Most of the time	-	1%	1%
	Rarely	2%	4%	3%
	Never	95%	94%	94%
	Total	100%	100%	100%

It was not surprising that so few respondents indicated they sold to the BoM as miners indicated there are many barriers for selling to the BoM (Figure 7-3).

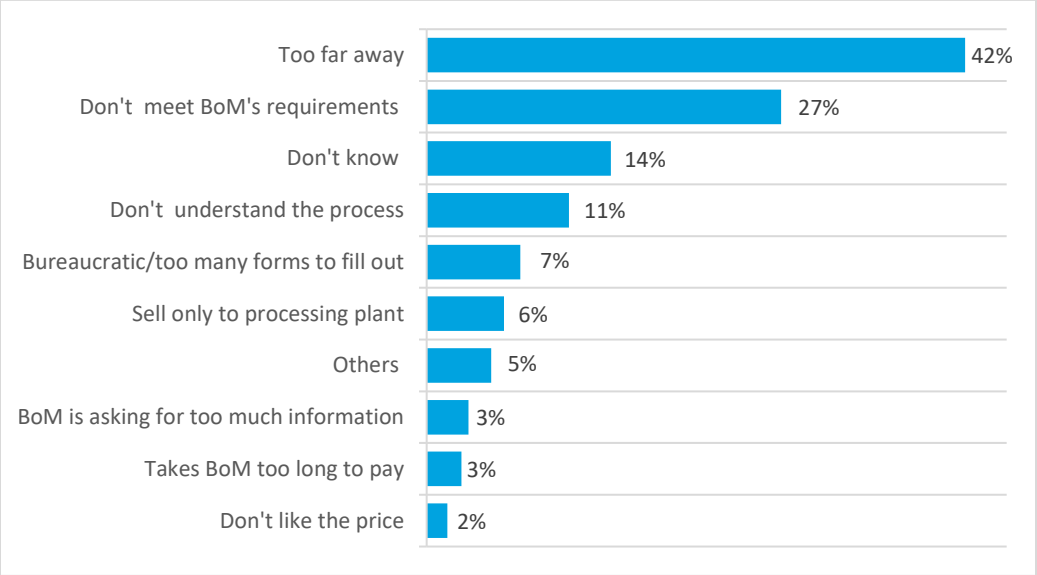


Figure 7-3. Justifications for not selling to Bank of Mongolia (n=371, multiple answers recorded, total = 443)

Geographical accessibility is one of the main barriers for the BoM's formal gold buying program (42% of all respondents). Furthermore, the current BoM purchasing method takes time as all processes are centralized in Ulaanbaatar, Darkhan and Bayankhongor. With such vast distances and the underdevelopment of infrastructure and bad road connections, miners would have to travel from several hours to days, in order to sell their mined gold to the central bank.

The establishment of a one-stop shop (OSS) in Darkhan-Uul and Bayankhongor aimags was the first step in expanding the official gold buying network and expanding into important local gold producing areas. It also provides opportunities to reduce illegal gold trade. However, because there are many other provinces that have active ASGM, the number of these one-stop service centres is not enough, and the gold trade is still dominated by the local gold traders.

As part of the legal framework assessment of Mongolia, conducted by planetGOLD Mongolia (IRIM, 2021), the two one-stop shops were assessed on their effectiveness and whether the miners approached the shops to assay and sell their gold. However, the results of the survey showed that the 50-gram threshold for gold assaying is a major issue for miners who depend on the daily income from artisanal mining. As well, because miners do not have any information on how gold trading is done at the OSS, as it is mostly gold traders who approach these. These finding were confirmed by the contextual study, as 27% of respondents answered that they do not meet the requirements of the BoM, mainly due to the 50-gram threshold. In addition, respondents indicated they did not sell to the BoM due to perceived administrative barriers, responding they do not understand the process (11%), they have to fill out too many forms (7%), the bank asks for too much information (3%) or takes too long to pay (3%). Selling gold formally will almost always imply more bureaucratic procedures than selling informally. The key to overcoming this is to provide adequate incentives to sell formally and conversely, the existence of disincentives to sell informally, such as policing the illegal gold trade. Around 6% of respondents answered that they always sell to processing plant or mill owner where they process their ore, some even indicated that they were not allowed to sell their gold to anybody else. This indicates that established business relations can also pose barriers.

Interviews with some gold traders indicated that they are open to exploring formalization of their trading operations and selling to the BoM. A gold trader from Mandal replied they applied to the FRC for a gold trading special license, while other soum traders were unaware of this option, but were happy to hear that the ASM gold trade sector is being legalized and regulated. For instance, a gold trader in Gobi-Altai province emphasized: “I would gladly register as a gold trader. It will be beneficial for me to work based on legal grounds.” According to interviews with gold traders, some of them think the main issue with selling to the BoM is that they don’t know how much information the BoM asks for, or they are hesitant to answer questions about the origin of the gold, and others used to sell to BoM, but stopped because of the increase in royalty taxes from 2,5% to 5% in April 2019. In order to understand the benefits for miners who trade with the BoM, it is also important to evaluate the formal market in comparison to the informal market. This study did not include questions directly asking about buying conditions of the informal markets, due to the sensitivity of these topics. Based on desktop studies, as well as informal interviews and observations from the planetGOLD Mongolia team members who spent time in the mining communities, it is evident that the informal market in Mongolia is very accessible and offers equal or higher prices than the BoM because they avoid the 5% tax. In the mining sector, it is common knowledge that essentially anyone can take their gold to the Urt Tsagaan gold market in Ulaanbaatar and sell their gold at a competitive price for cash in hand with no requirements or questions asked. Further research is required,

but it does not seem unreasonable to estimate that prior to the pandemic, the majority of all ASM gold is being sold into the informal market. If the informal market is so accessible and there are no effective disincentives to sell informally, the BoM will have difficulty competing with this market, and will continue to lose a large portion of the national ASM gold supply.

The success of Mongolia's efforts to formalize the gold trade will essentially come down to the simple question:

'Do miners and traders have an incentive to sell to the Bank of Mongolia, and conversely, are there barriers and disincentives to selling informally?'

Some of the key issues to evaluate this critical question are: Accessibility to point of sale; Price in comparison to international spot price and the informal market; Terms of trade; Form and timing of payment; Access to finance; Trust; Assaying and Weighing; Transparency and communication; and Enforcement and policing of regulations. The policy framework (IRIM, 2021) report will analyze and provide recommendations on these issues.

7.3 Traceability to the Mine of Origin and Due Diligence

The evaluation of compliance in the ASGM sector with international gold trading regulations and requirements is important, since this will eventually impact access to the international gold market, which has a knock-on effect to the local gold trade. Over the last decade, the international gold market has undergone a rapid process of formalization and regulation. This was initiated by a convergence of trends; increasing global awareness on the negative impacts of unregulated mining, consumer demand for responsible products, and government regulations to fight money laundering, terrorist financing, environmental protection, and social concerns (labor conditions, safety, child labor, etc.).

As a result, there are two critical criteria which the Mongolia gold trade should now comply with: traceability and due diligence. Internationally, all gold must now be traded with documental traceability to the mine or origin for every gram of gold purchased, along with due diligence of all actors and suppliers involved in the gold supply chain. These requirements began as industry voluntary standards but have gradually been converted into regulation. For brevity, the two critical standards that must be met are the OECD Due Diligence Guidance and the LBMA Responsible Gold Guidance. Traceability to the mine of origin and due diligence on all actors who trade or transform the gold along the supply chain are the two key elements of both of these standards. As of January 2021, these are now legal requirements for all gold sold into the European Union according to the new regulation on Conflict Minerals. This is relevant because Mongolia currently exports large quantities of gold to a refiner in Switzerland. Compliance to these standards will also impact the country's banking relations.

Currently Mongolia is not in compliance, and this is going to create increasing challenges and risks for Mongolia to continue to have access to international gold markets and banking services. Today, the BoM is not able to provide traceability to the mine or origin

for the gold they purchase or export. Previously any individual could sell gold to the BoM and were only required to bring their ID and the assay results for the gold. No questions or documentation was required to indicate the mine of origin or whether the gold came from formal or informal operations, or whether it was from ASM or industrial mining. In March 2020, new regulations were put in place to accredit and provide a license to authorize individuals and legal entities to trade gold, issued by the FRC. This is an important first step, but these regulations are still not in compliance with international gold markets' expectations, and regulations to provide traceability to the mine or origin. This is troubling, as they currently have an agreement with a Swiss refiner to export all of their gold to this jurisdiction. The BoM is not complying with the regulatory requirements of the Swiss refiner and is in a precarious situation that exposes it to potential scrutiny and repercussions from the international gold market.

Traceability would also provide greater access to data for the Mongolian authorities and would allow for the BoM to monitor the collection of taxes. Currently, it is common practice for actors to avoid paying gold royalties by selling to the BoM as an individual, instead of registering the trade under the mining operation.

The Mongolian Tax Law stipulates that a business entity must pay 10% tax on an income of up to MNT 3 billion and 25% tax on any income above MNT 3 billion. This provides a strong economic incentive to evade taxes by selling gold under an individual's name to avoid a business from crossing into the higher tax threshold (Government of Mongolia, 2020). As a result, mining operations of all scales, both ASM and industrial, sell small quantities of gold to the BoM through individual traders to avoid taxes. For example, the BoM purchased 15.2 t of gold in 2019, of which 49% or 7.4 t was gold delivered by 423 individual citizens. However, it is not clear how much of this gold was mined by either artisanal miners and supplied through the unofficial gold traders, or how much came from industrial gold mining businesses in order to simply evade taxes.

Formalization of the gold trade is essential in combating the issues with traceability, due diligence, smuggling and tax evasions.

Record Keeping Practices for Gold Trading in the Study Areas

During the survey, several questions assessed record keeping practices of artisanal miners. Those documentations are important prerequisites for a transparent supply chain (Table 7.3-1). According to the survey, 43% of respondents in the surveyed soums, keep records of extraction, with variations ranging from 70% in Tunkhel to 15% in Altai. In total, 24% of respondents reported they keep records of the gold they sold. And 11% only received a receipt from the gold buyer. About 29% of respondents indicated they keep financial records of their operations. Overall, record keeping practices where the highest in Tunkhel, followed by Mandal, and the lowest in Bayangol and Altai. Formal mining organizations had better record keeping practices than informal and illegal miners, especially for ore extraction and financial records (Table 7.3-2).

Table 7.3-1. Record keeping practices of miners by study areas

	Bayangol	Mandal	Tunkhel	Yusunbulag	Altai	Total

	(n=52)	(n=112)	(n=71)	(n=62)	(n=74)	(n=371)
Records of extracted ore	19%	48%	70%	53%	15%	43%
Records of gold sold	19%	27%	35%	21%	14%	24%
Receipts provided by gold buyer	12%	14%	17%	8%	3%	11%
Financial records	21%	36%	45%	24%	12%	29%

Table 7.3-2. Record keeping practices of miners by form of organization.

	Registered partnership (n=197)	Unregistered partnership (n=34)	ASM NGO (n=51)	Informal miners (n=17)	Illegal miners (n=72)	Total (n=371)
Records of extracted ore	48%	47%	69%	24%	11%	43%
Records of gold sold	27%	24%	33%	18%	10%	24%
Receipts provided by gold buyer	13%	15%	12%	12%	3%	11%
Financial records	32%	26%	47%	18%	10%	29%

During interviews, gold traders stated that they record the date of sale, name of the person who sold the gold, as well as the amount of gold and the estimated purity. However, they do not ask where, when, or how the gold ore was mined or processed.

Record keeping of historical gold production and sales is not only important for traceability and due diligence but will also be a critical tool for establishing financial records and qualifying for access to finance.

7.4 Access to Finance and Investment

Poorly practiced ASGM can be a source of significant negative social and environmental impacts. However, when conducted responsibly with appropriate environmental safeguards, ASGM can generate significant income and positive social benefits for miners and their entire surrounding community. For responsible ASGM to serve as an economic catalyst in these communities while avoiding or minimizing negative impacts, the sector requires access to finance that will allow the deployment of cleaner and more efficient technology and sound environmental management practices, all conducted within an enabling policy environment. In the last decades, technology and policy advances have been made within the ASGM sector, yet strong barriers to formal finance remain (planetGOLD, 2020).

An additional barrier for artisanal miners is that current regulations and policies do not touch upon attracting investment to ASM. The limits on ASM mining permits hampers foreign investment due to the lack of collateral. It also closes equity markets to the miners – the traditional source of early-stage financing for mining projects. The lack of early-stage capital effectively cuts off geological exploration which means that the cooperatives cannot build geological resources. Investment in mercury-free processing plants therefore becomes much riskier due to poor visibility on the amount of ore and the head grade. An investor, without a geological resource for a project, has no idea if the project can return his or her capital. Plus, there is no recourse for the land if the project runs into trouble.

Thus, there is a growing understanding and recognition of the extent to which an inability to access formal financing channels presents a key barrier to market participation for artisanal miners. Most miners rely on cash loans and payment advances from down the supply chain, such as changers and processors. Without access to working capital to purchase machinery, the effective productivity of ASM sites is restricted. Without access to a secure, regular, and reliable cash flow, many miners rely on gold traders to repay loans with gold even if the price offered is below market value. The informality of typical ASM partnerships, coupled with the perceived high-risk status of the sector by financial institutions, excludes them from gaining access to basic financial services.

During the interviews, leaders of ASM organizations mentioned that, because most miners do not pay social insurance, they cannot provide any proof of income to the bank. Also, because the ASM regulation prohibits miners from using their ASM permit and land as collateral or shifting their land rights to others, this limits their ability to approach banks as well. On the other hand, the mining income is considered high risk and not stable. Thus, there is a perception of having no valuable collateral available, a main financial requirement in financial systems required to protect banks from non-performing loans. For instance, one of the ASM organization leaders mentioned:

> *"I tried to approach the banks for loans, by providing the official documents of our ASM organization registration and income statements. However, they did not deem us as viable for a loan. I think banking institutions need to be informed and provided more knowledge on ASM, its legalization and formalization."*
>
> **KII, female partnership leader, Selenge aimag**

An additional challenge is the lack of accounting skills and financial recording practices of miners (Section 7.3, Table 7.3-1). Of the respondents, 71% indicated that they do not keep financial records. The traders register and record their trading activities in their black books, which acts as an unofficial financial statement. While this method is widely used in Mongolia, it often does not provide a record of where traded gold was mined, as well as whether those mines were licensed.

Only 3% of miners receive financing from commercial banks. 83% of miners answered that they use their own capital to finance their mining operations (Table 7.4-1). A total of 9% of the respondents indicated gold traders provide financial loans to miners to secure their unofficial buying network in the local area by offering substitute loans to the miners who have been rejected by banks and other financial institutions and permit the miners to repay with gold. The small gold traders also work with UB gold traders and receive large amounts of gold trade financing to leverage their gold buying capacity from local areas. According to KIIs, some ASM partnerships collect money from the partnership members, to use as starting capital for their ASM operation.

Table 7.4-1. Financing options for mining operations, by study areas (multiple answers recorded, total=545)

	Bayangol (n=52)	Mandal (n=112)	Tunkhel (n=71)	Yusunbulag (n=62)	Altai (n=74)	Total (n=371)
Own capital	83%	75%	85%	84%	93%	83%
Commercial bank	4%	4%	0%	3%	1%	3%
Non-bank financial institution	4%	3%	3%	5%	0%	3%
Gold traders	12%	12%	7%	5%	8%	9%

Processing plants	13%	8%	7%	3%	1%	6%
Others	10%	18%	20%	23%	22%	19%

During KIIs, when asked about the last investment done for the ASM site, most of the leaders of ASM organizations mentioned building fences, setting up the residential zone, and collecting salary payments for security guards. One partnership leader explained the need for equipment to improve the recovery rate and hence, the efficiency of the operation:

> *There is a need for investment. We do have some basic equipment like large and small mills and hand hammers in our partnership. We face the biggest losses when extracting gold from ore. If not for the project, we would have used mercury. Currently out of 100 grams of gold, 70% is wasted – we get only the remaining 30%. A sand or soil gold is easy to extract as particles are large in size and can be washed with little waste. But it is complicated to extract gold from main and stone gold deposits because it goes through milling and comes out like flour powder. It's quite difficult to wash this powder with water. The only metal that can amalgamate it is mercury. For more sophisticated processing, we need equipment that is used in mill workshops.*
>
> **KII, male partnership leader, Khovd aimag**

Asked about future perspectives if miners had better access to finance, most survey participants (53%) answered that they would upgrade their mining equipment should they have funding (Chapter 4, Figure 4-4).

Artisanal gold miners were also asked during the survey whether they currently have any bank loans. The current study did not examine loan objectives and amounts. In total, 54% of respondents had a bank loan. Since very few miners indicated that commercial banks are financing their mining operations, it can be assumed those loans are mainly used for purchasing housing, vehicles, livestock or other possessions which are also used as collateral. It is plausible that the loans were taken due to lack of income to meet household needs due to insufficient income from artisanal mining.

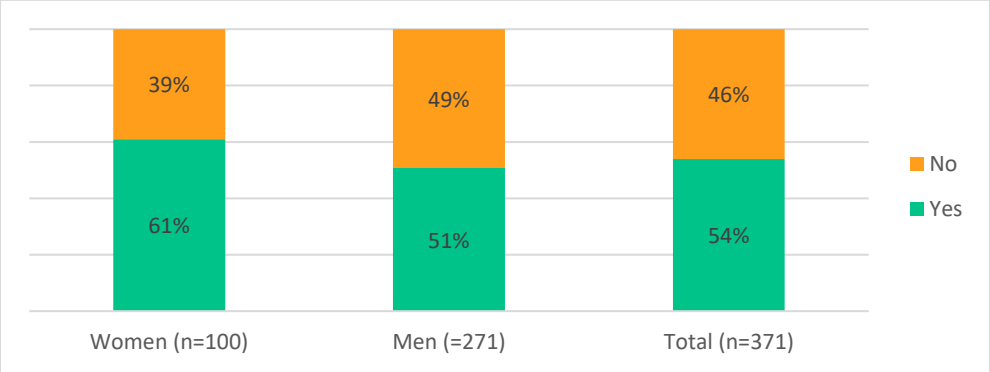


Figure 7-4. Number of respondents with bank loans, by gender and total

7.5 Conclusions

Although the entire gold supply chain is regulated by the Government of Mongolia and the BoM is the end buyer of locally produced gold, mostly bought through commercial banks, with FRC starting to license and register the individual gold traders, there is still room for

improvement in gold traceability and registration to regulate unofficial gold mining and gold traders in Mongolia.

Currently, it appears that Mongolia is not in compliance with international standards and regulations on traceability and due diligence. This is going to create increasing challenges and risks for Mongolia to continue to have access to the international gold markets and banking services. Today, the BoM is not able to provide traceability to the mine or origin for the gold they purchase or export on gold that is sold through individual gold traders.

The survey showed that most miners lack capacity in many aspects important for formal gold trade in ASGM, which are bookkeeping, ore and gold trade registration, gold assaying, checking the gold spot prices and demanding the right to ask for a competitive gold price. The reason for the latter issue, could be lack of options for selling the processed gold, because the survey showed that in most cases the miners have only 1 or 2 traders or spots for gold trade in their respective areas. This results in lack of competition, and miners do not have any other choice, but to accept the conditions from local traders. The establishment of the OSS in Darkhan-Uul and Bayankhongor aimags was the first step in expanding the official gold buying network and reaching into the main local ASGM areas. However, at this time, the gold trade is still dominated by the local gold traders, who are just starting to be licensed by FRC.

In most regions where processing plants serve miners from hard-rock mines, the miners have to sell their gold to the plant. Thus, it is worth taking into account that processing plants act as a stakeholder in gold trading, and their role should not be overlooked.

The current regulatory policy seems contradictory. Although the main ASM regulation is not stable, BoM purchases ASGM gold regardless of traceability, but FRC is licensing the gold traders and enforcing registration of the gold purchased, enforcing the legislation on anti-money laundering and terrorism financing. Therefore, the current legislation that regulates the ASGM sector, including its formalization and supply chain, need to have coherence, to enable the improvement of the artisanal miners' current working conditions, ensure traceability and access to finance.

Underbanked artisanal miners do not have the option to obtain official bank and financial services due to unstable income, and the perceived risky nature of the sector, which is why they keep relying on the gold traders for unofficial, substitute loan services. This further creates a less transparent sub-industry of the gold mining sector. The lack of official access to finance is an immediate barrier to responsible ASGM practices, and actively detracts from the sector working to serve as an economic catalyst in local ASM communities while avoiding negative impacts.

On the other hand, current regulations and policies do not touch upon attracting investment to ASM. The limits on ASM mining permits hampers foreign investment due to the lack of collateral. It also closes equity markets to the miners – the traditional source of early-stage financing for mining projects. The lack of early-stage capital effectively cuts off geological exploration which means that the cooperatives cannot build geological resources. Investment in a mercury-free processing plant therefore becomes much riskier due to the poor visibility of the amount of ore and the head grade. An investor, without a geological resource for a project, has no idea if the project can return his or her capital.

8. Capacity for Better Mining Practices

Compared to the formal, large-scale mining sector, formal and informal artisanal gold miners tend to enter the sector without having previously been trained by an accredited institution in the field. They learn while working in the sector. Hence, access to reliable and updated information as well as training is indispensable for artisanal miners when it comes to understanding existing laws and regulations, regulating the sector, learning about better mining practices, having access to information on geological data or on how to access finance, etc. For the period between 2005-2019, training and capacity building activities for Mongolian artisanal miners were provided mainly by and with support from the Sustainable Artisanal Mining (SAM) project (See Info Box 4), funded by Swiss Development Cooperation in Mongolia. The ASM NF (See Info Box 5) was involved as a key organization to provide training and information since its establishment in 2013 with the support of the SAM project.

The National Action Plan for Reducing mercury pollution caused by ASGM for 2019-2023 has the objective of "Enabling ASG miners and the social groups that are vulnerable to ASGM negative impacts to gain knowledge on mercury impacts, environment, health, safety and the legislations and ensure that increased access of miners to information" (Government of Mongolia, 2020: 54) and planning to implement related training, information and awareness raising activities in collaboration with respective ministries, aimags and capital governor's offices, the ASM NF and international organizations.

8.1 Information Sources of Miners

Access to information is an important resource for miners to acquire knowledge for example on laws and regulations, better mining practices or the current gold spot price. While the widespread use of smartphones and access to the internet have increased the range of information miners can access, this does not determine the quality of the information. However, the objective of the survey was to understand how miners prefer to receive information to identify locally adequate information channels for project related activities.

Around half of the total respondents (51%) receive their information on artisanal gold mining from people within the ASGM sector, 32% from family, friends, and relatives. Public and government organizations are ranked as the least important information source (10%).

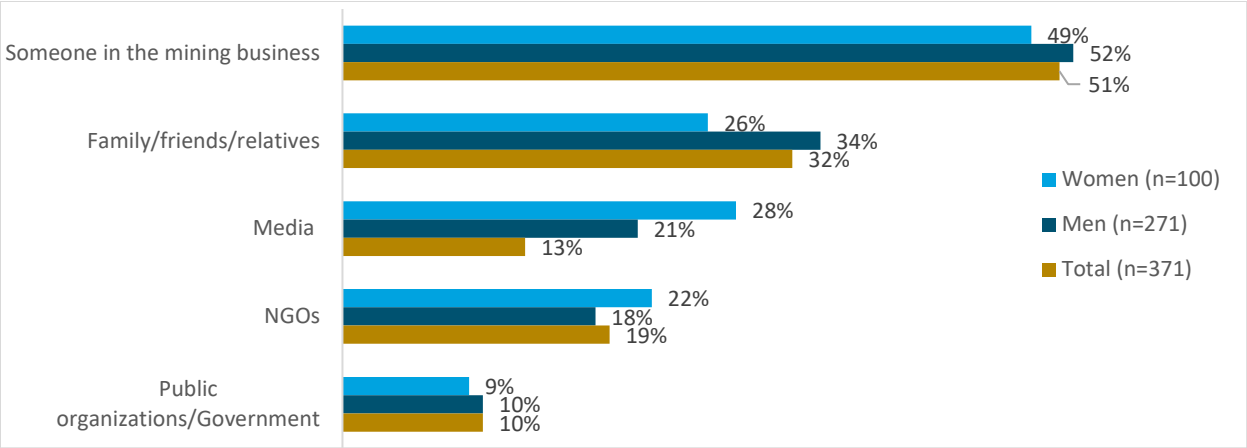


Figure 8-1. Information sources on ASM, used by respondents, by gender and total (multiple answers recorded, total=503)

As for the question on miners' awareness about the ASM Knowledge Hub (a platform created by the SAM project to provide miners and stakeholders with an opportunity to exchange and share information related with ASM; https://www.asmhub.mn/en/home), almost 90% (n=331) were not aware of it. Among those who were aware of the Knowledge Hub (n=40), women were slightly more aware of the hub than men (13% versus 10%, respectively) and only 22 respondents were able to access information, while 6 miners knew about it but did not use it. Knowledge about the Hub was slightly higher in Mandal (15%) and lowest in Altai (7%).

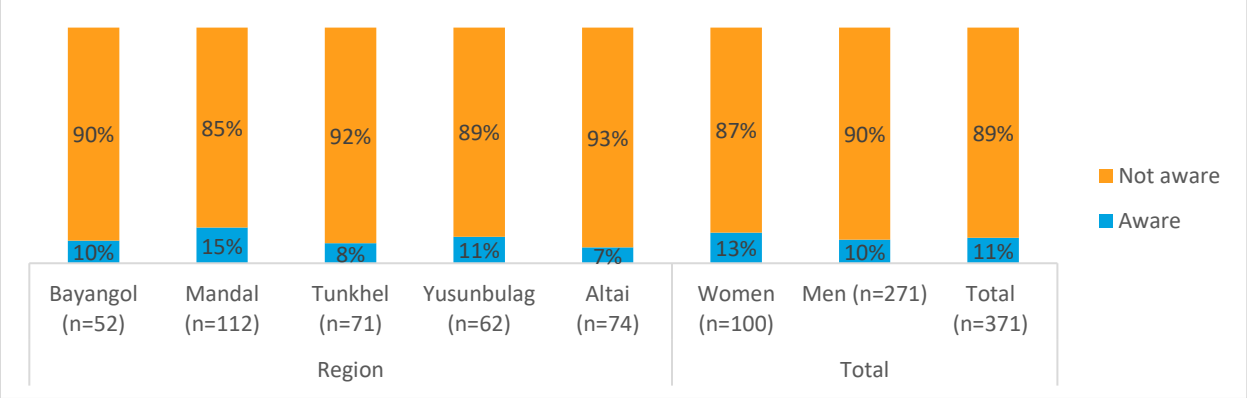


Figure 8-2. Overall awareness of the ASM Knowledge Hub by study area, gender and total

While the ASM Knowledge Hub is a good approach to provide relevant information on one centralized platform, the survey shows that miners are overwhelmingly not familiar with the tool, and that websites do not belong to their preferred medium to access information. Respondents were asked to list their preferred medium for accessing occupation related information. Approximately 55% answered that they prefer to get information from the television, 46% through their mobile phones and 44% from Facebook (Figure 8-3). Women miners preferred to receive information through social media (Facebook) and TV, while male miners preferred the television and mobile phones.

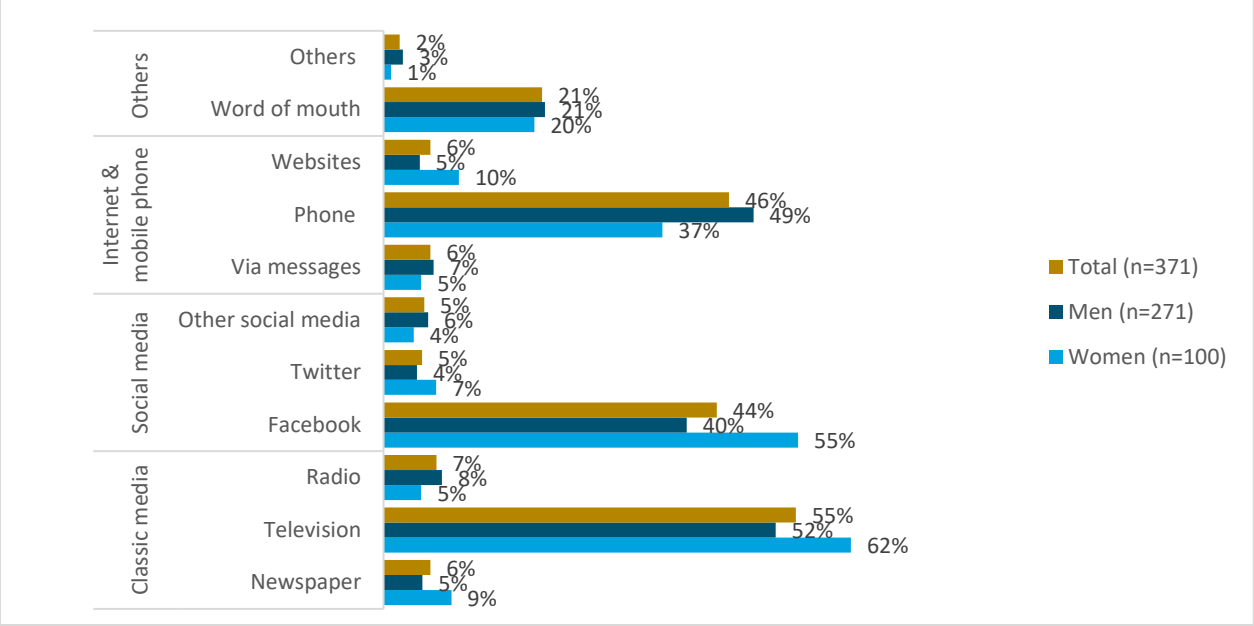
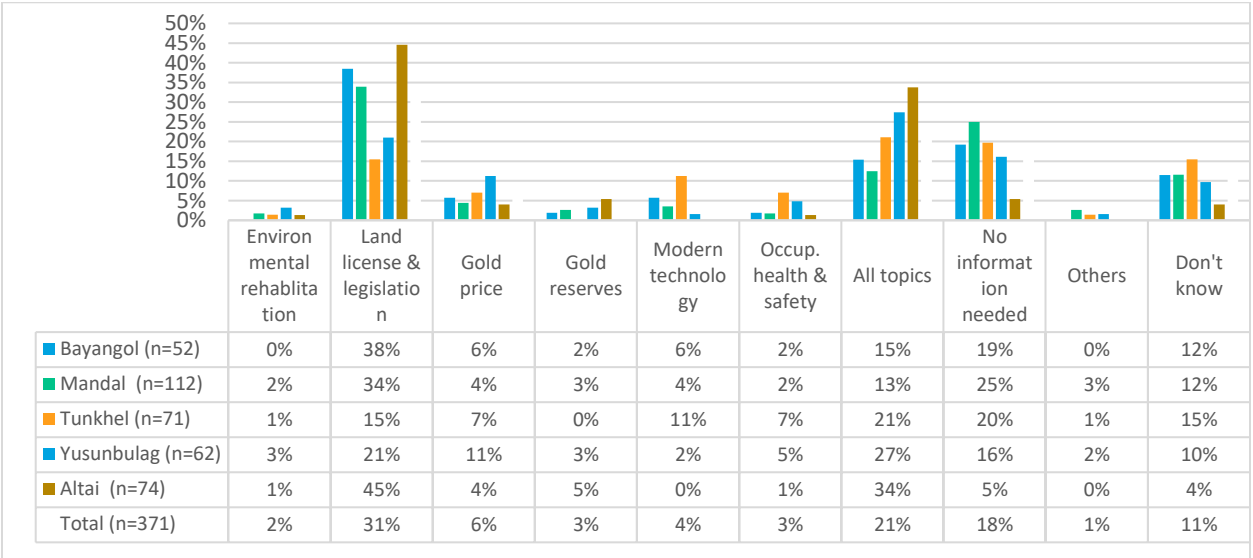


Figure 8-3. Preferred medium for accessing news and information, by gender and total (multiple answers recorded; total=757)

Regarding the type of information miners would like to receive on ASGM, the largest share of participants named land licensing and legislations as primary topic of interest (31%), followed by information needed on all topics with 21%, respectively. Breaking down to location, the percentage of miners seeking information on legal frameworks were higher in Altai, Bayangol and Mandal, accounting for 45%, 38% and 35% respectively. Other topics of interest mentioned included gold prices, gold reserves, modern technology and occupational health and safety (6% to 3%), while 18% of respondents said they do not require any information.



	Environmental rehablitation	Land license & legislation	Gold price	Gold reserves	Modern technology	Occup. health & safety	All topics	No information needed	Others	Don't know
Bayangol (n=52)	0%	38%	6%	2%	6%	2%	15%	19%	0%	12%
Mandal (n=112)	2%	34%	4%	3%	4%	2%	13%	25%	3%	12%
Tunkhel (n=71)	1%	15%	7%	0%	11%	7%	21%	20%	1%	15%
Yusunbulag (n=62)	3%	21%	11%	3%	2%	5%	27%	16%	2%	10%
Altai (n=74)	1%	45%	4%	5%	0%	1%	34%	5%	0%	4%
Total (n=371)	2%	31%	6%	3%	4%	3%	21%	18%	1%	11%

Figure 8-4. Types of information sought after by ASM miners, by study area and total

8.2 Training Experience and Training Needs of Miners

Training Experience within the Last Two Years

A total of 35% (141) miners had attended at least one mining related training over the past 2 years. Women generally had attended more training sessions on various topics compared to men (47% versus 35%, respectively) (see Section 6.2). Miners have mainly received training on formalization (19%) and better/responsible mining standards (19%).

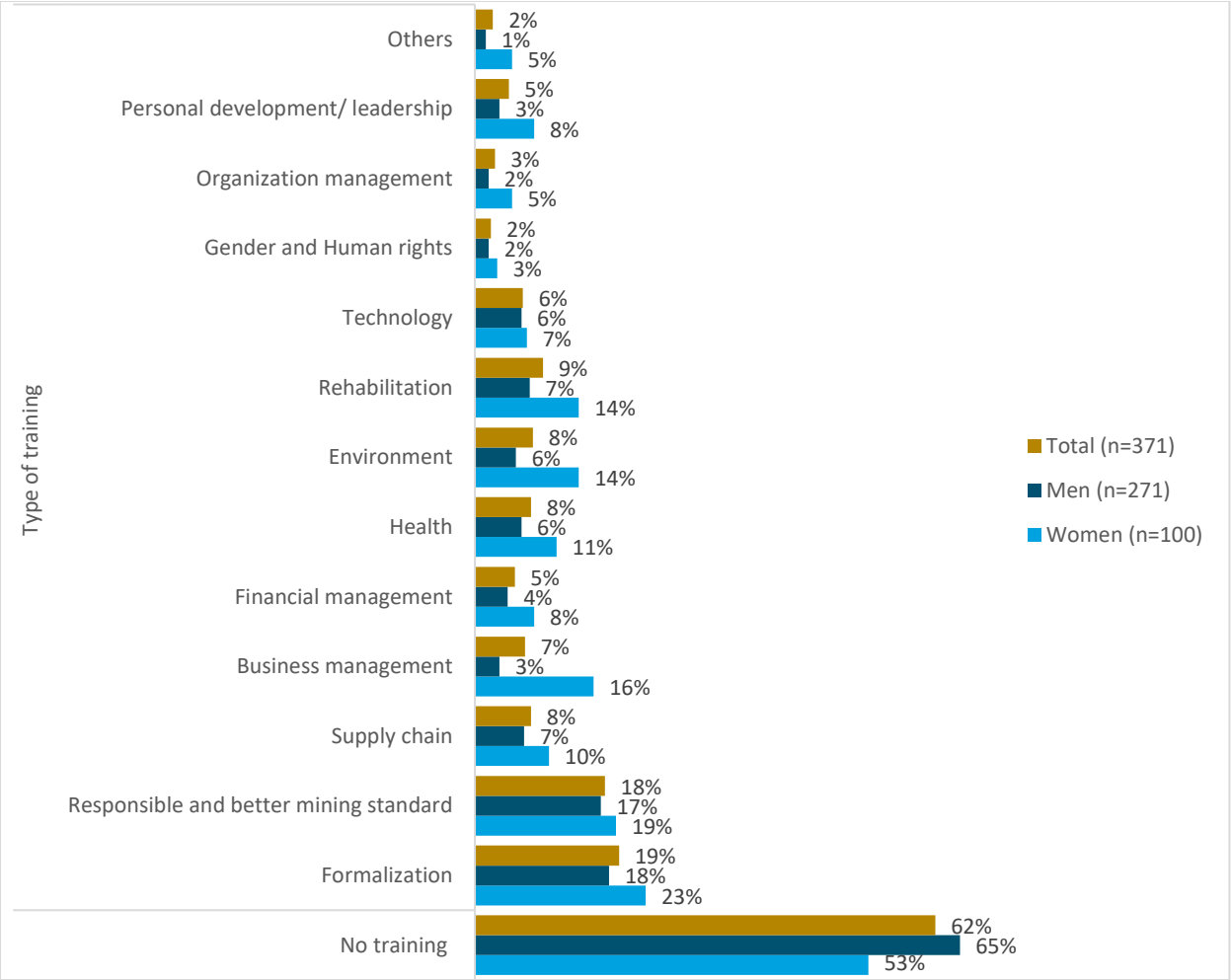


Figure 8-5. Training attendance of artisanal miners in the recent 2 years by gender and total

The participation in training varied between the study areas and between women and men miners (Figure 8-6). While miners in Tunkhel and Yusunbulag had the most training experience (51% and 44%, respectively), especially women miners in Mandal had also received more training (57%). Training participation was the lowest in Altai (20%) and Bayangol (22%).

A partnership member in Khovd aimag described how the safety training had made him aware of the importance of the topic:

> *We recently received a safety training which we lacked the knowledge of. With this training we understood that we should be accountable for our activity, ensure our own safety and use personal protective gears, for example to regularly wear a helmet and harness at mining site; and we re-organized our mining site. Further, we need capacity building or more professional training, for example on how to properly operate and maintain the equipment and technology etc.*
>
> **Male partnership member, Khovd aimag**

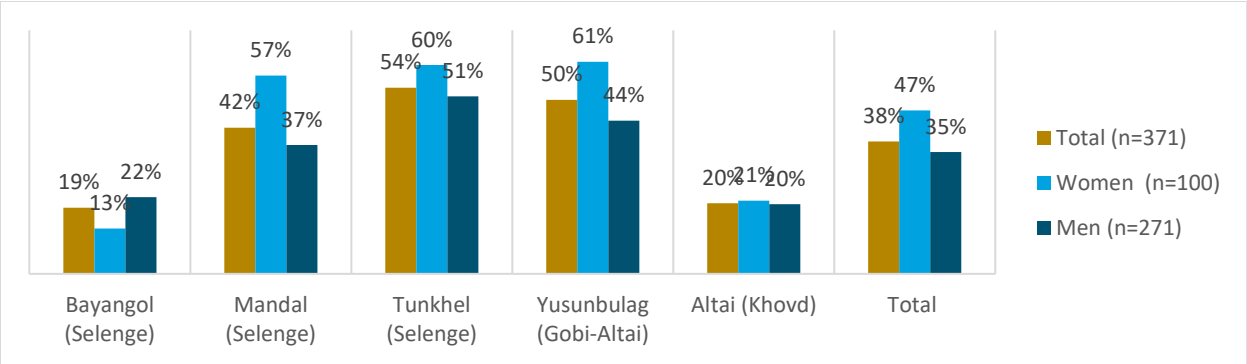


Figure 8-6. Number of respondents who had participated in training in past 2 years, by study area, gender and total

Most respondents (40% of 141 miners) had received training organized by the ASM NF who provides ASM training and other activities for its members and other miners. Overall, table 8.2-1 shows that most of the training was conducted by NGOs (54%).

Table 8.2-1: Training hosts named by survey respondents (n=141)

	Organizations	%
1	ASM NF	40%
2	From UB city	11%
3	Local Institutions	9%
4	NGOs	6%
5	Public institutions	5%
6	Swiss Agency for Development and Cooperation	4%
7	World Vision	4%
8	Don't remember	9%
9	Others	12%
	Total	**100%**

Training Needs

Respondents were asked which kind of training they would like to receive (Figure 8-7) in the future. Training on formalization was identified by miners as priority topic for capacity building (35%), as explained by a partnership member:

> Needs to have a training on ASGM laws and regulations. Miners suffer due to lack of knowledge on ASGM legislations and the policemen do not explain why they impose a fine on miners or confiscate ore/stones.
>
> **Female partnership member, Selenge aimag**

Other training needs identified included mainly responsible and better mining standards (26%), rehabilitation (27%) and technology training (26%). Women preferred more often than men training on formalization, business, and financial management as well as personal development and leadership, while more men wanted to receive training on responsible and better mining standards, occupational safety, rehabilitation, and technology.

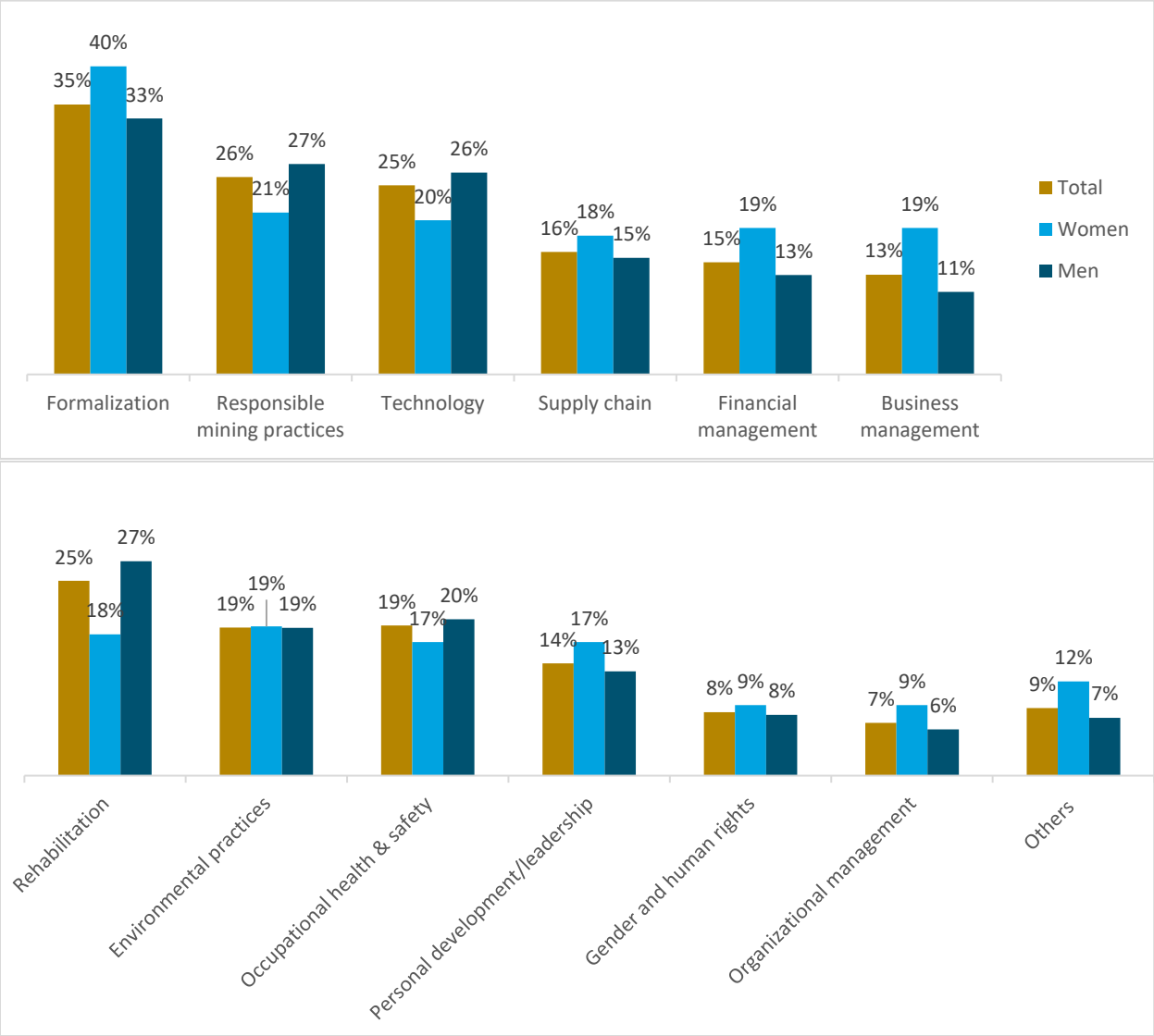


Figure 8-7. Training needs of respondents by gender and total (multiple answers recorded, total=850)

Based on information shared by local officials, the training priorities identified for artisanal gold miners included training on laws and regulations in order for miners to comply with legal frameworks, environmental training, occupational safety training as well as training on health impacts of mercury:

> Providing knowledge and Information on legislations and responsibility of miners is a first priority, then, may be the training on environmental protection and rehabilitation is important. They do not have knowledge on how to do environmental rehabilitation at hard-rock mines.
>
> **KII, female officer, Gobi-Altai aimag**

> In general, miners need training and services in our soum. Because until recently, they were informal, they did not receive proper trainings. So, now that they are formalized, miners need

to receive trainings in order to comply with relevant laws and regulations. I, myself, provide some advice regarding the mining safety.

KII, female officer, Khovd aimag

There were no trainings or information provided on impacts of mercury. NGOs organize safety training. There is a need to conduct more practical training for both formal and informal miners and their family members, because they influence the miners. Also, training on income diversification/alternative livelihood sources for those aged over 40 is needed. Environmental training should be also delivered and be incorporated in the kindergarten training programs.

KII, male officer, Selenge aimag

All types of trainings should be available for miners including the ones on dangers of using mercury. Miners should be trained in socialization and be able to receive psychotherapy services. There is always a need for training.

KII, female officer, Gobi-Altai aimag

The list of training needs specified by leaders of partnerships and NGOs in the study areas (Table 8.2-2) indicates that miners were too timid to bring up knowledge gaps regarding mercury, since mercury is illegal, or they were not sufficiently aware of their capacity gaps, e.g., on occupational health and safety. This also applies to the topic of gender and human rights (Section 6.2).

Table 8.2-2. Training needs highlighted by NGO and partnership leaders during KII in the study areas (no comprehensive list of training needs)

	Bayangol	Mandal	Tunkhel	Altai	Yusunbulag
Legal frameworks		X			
OHS	X	X		X	
Health	X			X	X
Health effects of mercury use	X				X
Environmental protection		X			
Technology					X
Business					X
Supply chains				X	
Family relationships					X
Alternative income skills			X		

Training Formats

Interviews conducted with representatives from local governments and administration revealed that it is advisable to conduct trainings at workplaces and pay attention to involving inexperienced miners. The authorities also noted that trainings are well attended by women and fail attracting men and other family members. A male leader of ASM NGO in Selenge aimag highlighted:

It might be plausible to conduct training programs separately for men and women. Women are more responsible and socially active, they can be moved to alternative workplaces, or participants should be organized into groups.

KII, male leader of ASM NGO, Selenge aimag

Managerial staff of some local NGOs suggested ensuring gender balance in trainings by attracting more male participants. In order to improve the outcomes, NGO representatives also advised refraining from classroom trainings and instead of doing a half-day participatory field training, which would likely increase the male attendance. It was advised to develop tailored trainings for women, men and youth based on their specific needs in addition to offering core ASGM content. This included for example targeted programmes for women aimed at improving skills and promoting employment.

8.3 Conclusions

Asked about preferred information sources, respondents stated that they mainly receive information from other people working in the ASGM sector, friends, relatives, as compared to government organizations. TV, mobile phones and Facebook are the preferred media tools of artisanal miners. Information on land licensing and legislations was identified as major information gap.

Around one third (35%) of the respondents had received artisanal mining related training in the past two years, mainly on formalization (19%) and better and responsible mining standards (19%). The NF ASM was the largest provider of training for miners over the past two years. The survey shows a capacity gap in several areas that are crucial for the adoption of better mining practices. While miners mainly voiced a need for training on formalization, responsible mining practices and rehabilitation, local officials and leaders also identified legal frameworks as key topic in order for miners to comply with existing regulations. However, they also emphasized the need for environmental training as well as occupational health and safety training, including health in general and the harmful effects of mercury use.

9. Recommendations

The artisanal and small-scale gold mining sector is a complex and multi-dimensional development issue. The areas that the contextual study investigated have revealed the nuances and challenges faced by the sector and is reflective of its complexity. This chapter discusses the study recommendations on the main topics covered.

Formalization

Establish an integrative approach

Improving the artisanal mining regulations needs to start with an emphasis towards an integrative approach that aims to address the various dimensions of the artisanal mining sector. A foundation of the approach requires strong government support and coordination at both the central and local levels, including policy makers and implementors, private sector, CSOs and miners, to increase the formalization process of artisanal mining in order to ensure miners work in compliance with relevant laws and legislations and to sustain their employment and income source.

Throughout the study, the fear of imprisonment and prosecution by government officials and law enforcement agencies has affected not only the sharing of information, but ultimately the ability to elicit full cooperation of the miners. The government may need to recalibrate its penal approach to the issue of formalization and ASGM and look more into a development-based approach that looks at addressing poverty as an issue, and mercury use a symptom of the broader problem.

Remove barriers to securing a permit

As a first step, the government needs to look at the availability of land that can be formally mined for ASGM which can provide a significant impetus to the formalization process. The lack of official land is one of the foremost reasons behind the increasing number of illegal mines. Furthermore, the government will need to review and address specific provisions regarding type of minerals, mining methods, mine life cycle, which can help eliminate the resulting distortions of the law that tend to act stifle formalization efforts.

Second, the government should clearly identify within the mining agreement the particular area to be rehabilitated, method and timing of rehabilitation, including an assessment, and specify future security measures.

Establish a sound basis for contracts and their extension

When extending a mining agreement based on the terms of the contract and the performance act, the sustainability of the mining activity should be taken into account. Cutting delays to the Land Conclusion and contract extension process is a crucial point for facilitating transition to responsible mining as miners would have a longer runway to implement needed reforms in their areas of work and secure financial returns to fund the reforms.

Currently, miners easily slip to informal status and then face the imposition of criminal sanctions against them because of procedural delays. This in part, leads to the need of simplifying the permitting process by eliminating the burden of long delays and bureaucracy as much as possible.

Re-establish trust of miners

Because the fear of imprisonment is preventing miners from fully cooperating with the government, the government will need to re-establish and gain the trust of the miners to bring them on board to support the NAP and other development plans. To bridge the divide, the government may consider establishing an amnesty period for miners to surrender their mercury inventory to the government. Any amnesty extended to miners will need to be followed up with facilitation of mining permits and registration that sets up the miners along the legal path. Amnesty without follow-up incentives will not be sustainable.

Social services

Improve and ensure access to social services

The survey also identified access to health care as a major issue for miners. In order to improve access to health care and identify acute health problems as well as chronic occupational health problems within mining communities, the government should discuss alternative solutions such as periodical health check-up camps, mobile clinics or the provision of telehealth services for artisanal miners. These have already been piloted in other remote groups in Mongolia (WHO, 2019). Collaborative efforts between mining organizations (NGOs, partnerships, associations), government authorities and other stakeholders are required to advocate for the need of artisanal miners to access health care and their specific needs arising from occupational health hazards, and to link mining communities to existing outreach efforts, and if required explore other options.

An element of access to social services is the need to assuage fears of miners that legal action might be taken against them if they go to health facilities and their information is taken. See discussion on Re-Establish Trust.

Expand social and health insurance coverage

The survey findings show that social and health insurance coverage for artisanal miners should be expanded. As social and health insurance provides financial protection in case of potential accidents and hazards, local governments must assume the responsibility of providing miners with information, knowledge and offering suitable insurance policy packages, considering for example the seasonality of employment of many artisanal miners. Local representatives interviewed for the survey noted that campaigns on promoting social insurance and health coverage to artisanal miners have had certain positive outcomes.

In addition to the recommendations on social and health insurance coverage, lack of access to childcare was noted by respondents, especially when miner-parents have to temporarily migrate to work at mine sites. Most children are left in the care of family

members in their hometowns when women miners go to mine sites for work. The need for access to childcare support facilities or provision of flexible work arrangements for women and men from the same household, which takes into account the special work conditions of artisanal miners, requires further investigation.

Increase awareness

In collaboration with local officials and partnership leaders, carry out activities to increase miners' awareness on the possibilities and benefits of accessing the government's social welfare programs and increase social and health insurance coverage. It is not only awareness on accessing health programs, miners will also benefit from an increase in their awareness on the importance of regular health check-ups for occupational risks such as silicosis or musculoskeletal problems, and chronic diseases such as kidney disease, liver diseases and diabetes.

Mining Practices

Extraction and Processing Practices

Adapt permitting requirements to ASGM sector capacity

Most processing facilities visited as part of the study were found to be non-permitted, lending way to lower standards of safety and environmental management, along with the inability for regulators to govern and work with the process plant owners on a fair taxing structure. Permitting costs alone represent a 100 million MNT entry barrier that makes it more attractive for potential owners to bear the risk of an illegal operation. A modified PPROP specific to ASGM, accounting for the practical realities of the sector, would create a more stable and transparent business ecosystem that can encourage miners to cooperate with the government without fearing for their livelihoods.

Expand mercury-free technology options

Processing plants across Mongolia are virtually identical to one another. A basic gravimetric system of sluices and shaking tables cannot be considered outdated, but greatly limits the competitiveness of these systems compared to facilities that utilize chemicals to assist with gold recovery. Current systems can be greatly enhanced, arguably even modernized, by utilizing a combination of leaching and/or flotation technologies. Gravimetric technologies typically only recover coarse gold and leave upwards of 60-70% of the gold in tailings.

Other jurisdictions that have prohibited the use of chemicals to assist with gold recovery often find themselves addressing illegal use and distribution of the banned chemicals, and contamination. Without firm guidance from the government, miners will embrace any available technology that improves their gold recovery. To leapfrog this situation, a rational approach to chemical use is needed with the caveat that Mongolia develop a robust chemical usage and waste management plan to minimize health and environmental impacts, utilizing the formalization of ASGM as its foundation.

Promote fairer profit sharing of gold remaining in tailings

Gold ore processing in Mongolia is essentially a two-stage affair, with artisanal miners having admission to only the first stage prior to processing of tailings using cyanidation. Faced with limited processing options and high entry barriers to establish their own plants, artisanal miners are victimized by processing plant owners who frequently offer unfavourable conditions, as they usually profit from low gold recovery rates of their plants when they sell their tailings to cyanidation facilities. Fairer profit sharing between miners and processors would ensure a more even distribution of wealth and provide miners access to capital to invest in their own mining and processing infrastructure.

Greater access to mineral processing training

The surveys revealed that miners currently possess low levels of gold processing knowledge, resulting in a lack of adequate process and quality control. Process plant operators do not fare much better, although it can be argued that they have no incentive to implement any mineral processing knowledge they may possess to increase the efficiency of their processing plants as this would reduce the amount of gold remaining in the tailings they keep to sell to cyanide facilities.

Environmental Practices

Diversify rehabilitation approaches and improve monitoring

ASM organizations are to be advised on taking not only technical rehabilitation actions but also biological ones. Cooperation between ASM partnerships and local governments need to be improved to implement proper rehabilitation plan and follow up actions. More diverse actions should be involved in their rehabilitation process. The process to withdraw allocated rehabilitation funds by ASM partnerships should be streamlined in order to facilitate easy access and timely rehabilitation.

Further studies should focus on collecting more data on damaged and rehabilitated land by each ASM partnership throughout the country, on water sources for processing plants, and other environmental issues in ASGM. This database is an important prerequisite to monitor long-term environmental implications of ASGM operations and identify areas of most concern.

Improve waste management

ASM partnerships should be encouraged and taught to practice environmentally sound waste management. Mining operations should be provided with options where to safely dispose of any chemical and hazardous waste, such as batteries, motor oils and chemical reagents. The importance of proper waste management practices should also be integrated into training program for artisanal miners (see Capacity Building).

Occupational Health and Safety Practices

In order to improve compliance with occupational health and safety standards amongst artisanal miners, the following mechanisms need to be strengthened:

Improve OHS training practices

Artisanal miners should be regularly trained on occupational health and safety, in order to understand the various hazards that are prevalent in the sector, from obvious risks such as collapsing mine shafts, to more subtle risks such as noise or unknown risks such as chemical exposure. This knowledge will lead to the awareness that compliance with OHS standards is important. Furthermore, access to training and equipment is especially challenging for informal and illegal groups. Since OHS compliance was lower among informal and illegal miners, it is important to include these groups into OHS trainings.

OHS training should not only address specific measures, but also planning. This includes training on the importance and function of an OHS plan and the roles of an OHS officer. OHS officers should be provided with the opportunity to further their knowledge on a regular basis.

Due to the difficult livelihood conditions of many miners (e.g., hygiene at mining site, alcohol abuse), training should also cover health hazards that are not directly occupation related but can lead to overall improvement of artisanal miner's health and lifestyle.

Local government officers, who are in charge of mining or OHS, have the responsibility to conduct capacity building trainings on legal frameworks and OHS to miners. However, the OHS knowledge of these local officers is not sufficient or is on different levels. Therefore, they need to be sensitized on ASM regulations and safety rules in order to fulfill their responsibilities.

Improve data reporting system

There is noticeable lack of updates on ASM OHS at the local level, even though the local governments have the responsibility to maintain ASM data and submit reports to the MPRAM on ASM status including accidents. The accidents are recorded locally, but there is currently no structured reporting and registration system in place that reports on ASM specific data to the national level. In addition, reporting on illegal or informal mining groups, which usually have a higher OHS risk, remains a challenge. Since data quality mainly relies on local stakeholder collaboration, relevant government agencies need to improve coordination to keep information up-to-date and accessible. For example, the national government might provide a reporting template to standardize data collection, and aimag and soum stakeholders should implement a system at the local level that can reach out to all artisanal miners.

Mercury reduction

The reduction and eventual elimination of mercury use in the ASGM sector, as well as the prevention of future use, can only be achieved through a combination of various measures, ranging from legal actions at the national level to improved access to alternatives at the local level of ASM organizations. Based on this study, the following actions are recommended:

Improve the formal trade of gold

While mercury takes the bulk of regulatory attention, it is worth noting that mercury is a symptom of a broader problem the miners are facing, which is poverty and unemployment. The chapter on gold trade explains how poor artisanal miners are taken advantage of or are placed in a no-win situation. An important step towards addressing mercury use in the sector is encouraging and promoting the trade of gold to formal market actors. Facilitating and supporting this trade by providing incentives and improved permitting procedures and rationalizing requirements to miners, will greatly change the dynamics on the ground that can pave the way for a sustained mercury-free gold processing ASGM sector. See detailed recommendations on gold trade below.

Set up alternative infrastructure

Financial and technical solutions to build mercury-free processing systems should be explored to provide miners with feasible alternatives that can also generate a higher gold recovery rate. However, new technologies need to be understood and accepted by miners, local governments and communities, and clearly show a better recovery rate.

Improve estimation and data collection

A data triangulation approach which also applies environmental assessments (mercury contamination of soils, water, equipment or air during vaporization events) might prove more reliable data points to calculate estimates. To improve the accuracy of the estimates, certain variables should be scientifically assessed by the inventory team to reduce the error rate. This especially applies to ore grade (average ore grade of an area, assessed through different spot measurements) and gold recovery rate for different processing systems. In order to upscale the data collection and estimation, it is important to build capacity at the national and local levels of government.

Awareness building

Many local authorities do not actively carry out awareness campaigns. Hence, local authorities and other local key stakeholders should receive training and information to carry out awareness campaigns among miners. As the health and environmental impacts of mercury are rather complex, a good messaging approach is key to successful local campaigns. Furthermore, information about various mercury-free solutions should be disseminated amongst decision-makers and miners.

Gender

Gender-disaggregated data for evidence-based decision-making

The study revealed a lack of gender-disaggregated data in the artisanal mining sector at the soum level which impedes gender-sensitive planning and monitoring of the sector overall. Hence, data collection efforts should include a database which allows disaggregation of data by gender, marital status, number of children, age and organization. This will support monitoring and evaluation efforts by checking whether social programmes and other support directed at artisanal miners reach the target groups.

Improve existing policies

In order to implement the "Gender-Responsive Policy in Geology, Mining, Petroleum and Heavy Industry Sector (2019-2026)", different stakeholders such as national researchers, the ASM NF and other parties should discuss and suggest strategies to implement adequate gender policies in the artisanal mining sector. The policy can support women in achieving a better work-life balance and at the same time strengthen women to take on leadership positions in the sector. These measures in the ASGM sector can also make an important contribution to close the gender-equality gap in the Mongolian labour market (see Khan & Aslam, 2013). In addition, more capacity building on gender, gender policies and gender-sensitive budgeting is also required especially at the local level amongst government officials.

Add rights training within the sector

In addition to the recommendations outlined in the section on capacity building in general, training on gender and human rights is required for women miners, men miners and leaders to enhance their understanding of what gender means, how gender identities are formed, how roles are created in society, and what gender equality means. This also entails training on gender-based violence and human's rights, covering different forms of GBV and strategies to mitigate and reduce GBV, including women empowerment, community support and involvement of local authorities.

Establish and promote women's organizations

The target sites had no women's organizations, indicating a low level of organization among women miners; those organizations can provide an important institutional setting to provide further capacity and offer a space for women empowerment. In addition, those women's organizations could elect a representative that would receive further training to act as a local gender focal point. Those focal points can for example monitor the implementation of gender-sensitive policies at the mining site, report violations as well as advocate for women's needs and voice women's concerns.

In addition, infrastructural deficits at mining sites pose a challenge for women and men; the support to build gender–sensitive spaces reflecting the special needs of women and men at mining sites, including gender-sensitive arrangements for men's and women's toilets and showers would improve the situation at work.

Gold Trade

Focus on Soum and Aimag Traders

The average volumes of gold being sold in the study areas are estimated to be less than 50 grams, which is the minimum requirement for official assay for selling to the BoM. This minimum volume for assaying will remain a key barrier restricting artisanal miners' ability to sell directly to the BoM. This can be managed by promoting a strategy of using soum and aimag traders as the main suppliers of ASM gold to the BoM by acting as regional aggregators for artisanal mining communities. This underlines the importance that the

BoM should focus their gold trading formalization strategies on these traders. A positive first step has been the new regulations for licensing gold traders. This is a window of opportunity to make key improvements and the project should work closely with the government counterparts to make the most of this opportunity by providing recommendations, in particular, drawing on lessons learnt from the formalization of gold trading in other jurisdictions internationally.

Implement BoM due diligence

The BoM should perform adequate due diligence on gold supplied; this should be a top priority for reforms targeting the formal gold trading policies and practices of Mongolia. Adopting and applying international due diligence standards to comply with responsible ASGM practices could be one of the solutions. The Government of Mongolia should build upon already existing best practice examples in Mongolian ASGM to learn from their lessons learned and improve already gained experience. We recommend a study on the potential economic benefit the BoM could generate from implementing traceability which would facilitate collection of gold royalties. The project will continue to work closely with the BoM and Mongolian authorities to improve the formal gold buying policies and practices around these key issues in order to stimulate a greater capture of the ASM gold supply by the BoM.

Expand licensing of gold traders

It is recommended that a strategy to educate and incentivize the traders to register for a gold trading license and sell to the BoM be a priority in Mongolia's efforts to capture a larger share of the ASM gold supply.

Incentivize formal trade of gold

Selling gold formally will almost always imply more bureaucratic procedures for artisanal miners than selling informally. The key to overcoming this is to provide adequate incentives to sell formally and conversely, the existence of disincentives to sell informally, such as policing the illegal gold trade. In addition, miners who are in charge of administrative tasks should receive training to help understand the bureaucratic process. If the informal market is so accessible and there are no effective disincentives to sell informally, the BoM will have difficulty competing with this market and will continue to lose a large portion of the national ASM gold supply.

Increase One-Stop Services

It is recommended to increase the number of one-stop-service centres or officially adopt and accept alternative ways to determine the gold content, seek ways to privatize the assay services to other stakeholders than the government assay office (PMAID) in order to decentralize the assay services. The newly drafted Law on Treasury Fund could act as a way to decentralize and liberalize assay services and the gold trade process in rural areas.

Focus on processing plants

The report shows why authorities should place special attention on regulating the processing plants and incentivizing them to sell to the BoM. We would recommend that any gold trading formalization strategies focus on the processing plant owners as a key actor. Incentives for the processing plants who perform due diligence, implement traceability to the mine or origin, and sell formally could be an efficient strategy. This is aligned with the strategies of many other gold trading jurisdictions which have placed the burden of formalizing the gold trade, due diligence and traceability with the major bottle neck actors in the supply chains, such as major exporters, processing plants and refiners. Since the processing plants have greater economic resources and in general, also capture a disproportionate share of the gold value in the supply chain in comparison to miners, they have greater resource capacity to implement these policies.

Installation of compliance officers in processing plants

The planetGOLD project will explore incorporating a formalization and compliance officer into the mercury-free processing plant's core staff so that they can provide these services to the regional artisanal miners. This could facilitate and incentivize artisanal miners to sell into the formal supply chain. Integrating the one-stop buying centre model in connection with regional mercury-free processing plants is another strategy the planetGOLD project will explore further with our partners.

Increase capacity building on gold trading practices

Many survey respondents did not assay their ore, nor did they check gold prices prior to sale, especially in Altai. Training on the benefits of assaying the ore before selling, providing knowledge through an ASGM hub knowledge platform (similar to the SAM ASM knowledge hub, but with better reach, as the knowledge hub was barely used by respondents), as well as checking the BoM and online source for the market price of gold can increase their negotiation power with traders.

Finance and Investment

Develop curated ASGM financial information for financial sector actors

Proper investment and access to finance is one of the most important factors for developing and maintaining responsible ASM. Thus, it is important to provide relevant information to financial institutions and possible investors (i.e., impact investors) about the risks, e.g., overlapping claims, permits, etc., and elements that affect return on investments, e.g., plant capacity and throughput, gold recover, gold reserves, etc. In addition, key data also includes formalization status, gold supply chain and the peculiarities of this sector.

Improving access to finance for responsible ASM

It is recommended for the government to incentivise miners and traders through developing a special ASGM program aimed at improving access to finance, increasing

formal gold supply and enabling responsible ASM. Involving gold traders, who have already formed informal lending networks with miners, in this program is recommended.

Improve the legal environment for ASGM investment

As it is difficult to get bank loans for ASM projects, one of the main ways to attract investment into ASM projects in other jurisdictions is selling shares or royalties in return for financing. However, the current Mongolian ASM regulations limit the attraction of foreign investment into this sector. Thus, it is important to look at the ASM legislations, to enable and build the foundation for attracting investment into this sector.

Capacity building

The study shows that more capacity building is needed among women and men miners, especially on topics related to formalization, better mining practices including OHS and environmental practices, as already outlined in the sections above. In addition, our study findings support the following additional recommendations:

Increase in Women's Training

The women respondents showed that women are more active in trainings than men; the reversed gender gradient in training experience in our study emphasises the fact that men should specifically be targeted for trainings. However, due to their roles in administration including access to finance, formalization and business development, further capacity building specifically for women can make them important change agents for better mining practices including more gender equality in the sector. This can also help women to earn higher wages and close the existing income gap. Hence, it is important to include women, from auxiliary workers to managers and leaders, in training programs.

Conduct gender and human rights training

Though gender and human rights training was suggested by a few miners only, in-depth interviews revealed a limited knowledge among miners on what gender actually means; it is important to provide the miners with appropriate knowledge on gender and human rights to know and protect their rights (see recommendations on gender above).

Adapt trainings that suit miner's needs

The training should follow a format which allows for half-day, participatory training sessions in the field, which targets increased participation by men (who seem less interested in training), and offers tailored sessions for women, men, or youth only, except trainings on the ASGM core topics.

Use social media and existing knowledge platforms

For the provision of general information and updates on ASGM for miners and to reach as many miners as possible, the use of social media such as their Facebook pages and groups is recommended. We recommended to utilizing existing platforms and networks for dissemination of information on ASM related news, land issues, funding, training, and

other activities. Based on the preference of respondents on how to receive information, it is important to provide awareness through various networks, including social networks and TV, to increase traffic and reach as many stakeholders as possible.

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11. Appendices

11.1 Appendix A: Questionnaire

CONTEXTUAL STUDY OF ASGM SECTOR

The purpose of this research is to study mercury use, occupational safety, mining, environmental, socio-economic and gender aspects of the ASGM sector in the PlanetGOLD Mongolia Project target areas. The confidentiality of this questionnaire shall be strictly maintained in accordance with the Law of Statistics and the Law on Individual Privacy, and shall be used solely for research purposes.

Do you agree to participate in this research study? Yes ☐ No ☐

INTERVIEWER SECTION

/specify/ _____	Draw down the answer	☐☐	Draw down numbers
1 2 3 4 5	Single choice answer, only choose 1 answer	_____	Fill in the answer
A B C D E	Multiple choice answer, choose up to 3 answers if necessary		Skipping question
☐☐☐☐☐	Ranking 1 - 10		

№	QUESTIONS	ANSWERS	COMMENTS
1	Questioner information	Enumerator No: ☐☐ Questionnaire No: ☐☐	
2	What type of artisanal gold mining do you work in?	Hard rock mining only 1 Placer mining only 2 Both 3	
3	Where does the current artisanal gold mining site locate in?	Bayangol soum (Selenge) 1 Mandal soum (Selenge) 2 Tunkhel village (Selenge) 3 Yusunbulag soum (Gobi-Altai) 4 Altai soum (Khovd) 5	
4	What is the name of mining site?	_____	*If we interview miners who are not working at the moment, we will write down their previous mining sites they worked at*

1. BACKGROUND INFORMATION

	QUESTIONS	ANSWERS	COMMENTS
1	What is your sex?	Female 1 Male 2	*Write down by observation.*
2	What is your age?	☐☐	
3	In which Aimag, Soum and Bagh do you live permanently?	Aimag _____ Soum, bagh _____	*If they live in or near their mining operation site, please wite down their permanent address*
4	What type of dwelling do you live in?	Ger 1 House 2 Dormitory 3 Apartment 4 Other/specify/ 6	
5	What is your marital status?	Single 1 Married 2 Cohabiting 3 Separated 4 Divorced 5 Widow 6	
6	How many members does your family have?	Members ☐☐	
7	What is your education level?	No education 1 Primary school (1- 4 grade) 2 Secondary school (5 - 9 grade) 3 High school (10-12 grade) 4 Vocational and others 5 Higher education (bachelor's) 6 Others / specify/ 7	

2. EMPLOYMENT

		Artisanal gold mining 1 Government organization 2	

8	What is your main employment?	Employed by private business	3	Please select only 1.
		NGO	4	
		Self-employed	5	
		Farmer	6	
		Herder	7	
		Student	8	
		Retired	9	
		Unemployed	10	
		Other /specify/ _____	11	
9	Do you have a secondary employment, if so what is it?	Artisanal gold mining	A	Please select 1 - 3 choices. No more than 3.
		Government organization	B	
		Employed by private business	C	
		NGO	D	
		Self-employed	E	
		Farmer	F	
		Herder	G	
		Student	H	
		Retired	I	
		I do not have a secondary employment	J	
		Other /specify/ _____	K	
10	What artisanal gold mining organization do you belong to?	Registered Partnership	A	Read out answers
		Unregistered Partnership	B	
		ASGM NGO	C	
		Informal group	E	Skip to Q12.
		I don't belong to any organization	F	Skip to Q12.
		Other /specify/ _____	G	
11	What is your status in the artisanal mining organization/group?	Partnership member	1	Please select all that applies
		Partnership leader	2	
		Cooperative member	3	
		Cooperative leader	4	
		ASGM NGO member	7	
		ASGM NGO Leader	8	
		Other /specify/ _____	9	
12	Do you prefer a woman or a man as leader of your partnership/cooperative?	Man /specify/ _____	1	Write down your answer
		Woman /specify/ _____	2	
		No preference	3	
13	What kind of work do you do in artisanal gold mining_	Miner	1	
		Shaft owner	2	
		Support worker	3	
		Other /specify/ _____	4	
14	How long have you been in the artisanal gold mining sector?	Less than 1 month	1	Please select only 1.
		1 - 3 months	2	
		6 - 9 months	3	
		9 - 12 months	4	
		1 - 2 years	5	
		2 - 3 years	6	
		4 - 5 years	7	
		6 - 9 years	8	
		More than 10 years	9	
15	Which months of the year do you usually work in ASGM?	January	A	Please select all that applies
		February	B	
		March	C	
		April	D	
		May	E	
		June	F	
		July	G	
		August	H	
		September	I	
		October	J	
		November	K	
		December	L	
16	How many days a month do you work in ASGM?	Less than 9 days/ a month	1	Please select only 1.
		10 days/ a month	2	
		11 - 20 days/ a month	3	
		21 - 31 days/ a month	4	
17	How many hours a day do you work on average in ASGM?	Up to 2 hours/ a day	1	Please select only 1.
		3 - 5 hours/ a day	2	
		6 - 8 hours/ a day	3	
		9 hours or more/ a day	4	
18	How many days in a week do you work on average in ASGM?	Everyday	1	Please select only 1.
		2 - 3 days/ a week	2	
		4 - 5 days/ a week	3	
		6 - 7 days/ a week	4	
3. INCOME				
19	What is your main income source?	Artisanal gold mining	1	Please rate your income source (1 being the highest or the most income source)
		Private business	2	
		Livestock	3	
		Agricultural	4	
			5	

		Retirement pensions and other pensions	6	
		Salary wages	7	
		Others /specify/ _____	8	
20	What is your monthly income?	Less than 1,000,000 MNT/month	1	*Read out answers Please select only 1.*
		1,000,001 - 1,500,000 MNT/month	2	
		1,500,001 - 2,000,000 MNT/month	3	
		2,000,001 - 2,500,000 MNT/month	4	
		2,500,001 - 3,000,000 MNT/month	5	
		More than 3,000,001 MNT/month	6	
21	What is your monthly average income you earn from artisanal mining?	_____		*Write down your answer. This question asks only income you earn from ASGM. This question*
22	Does artisanal mining income provide for you/your family's livelihood?	Yes	1	*Please select only 1.*
		No	2	
		Sometimes	3	
23	Do you pay social insurance fee?	Yes	1	*Please select only 1.*
		No	2	
		Sometimes	3	
		I don't know	4	
24	Do you pay health insurance fee?	Yes	1	*Please select only 1.*
		No	2	
		Sometimes	3	
		I don't know	4	
25	Do you have access to health services such as soum hospitals in the area you work as an artisanal miner?	Yes	1	*Skip to Q27.*
		No	2	
26	If not, what are the challenges?	_____		
		4. LEGALITY		
27	Does your partnership have land permission?	Yes	1	****If "I don't belong to any partnership" answer in Q10, please skip this question. ****
		No	2	
		I don't know	3	
28	Does your partnership have contracts with local authories in gold mining permission?	Yes	1	
		No	2	
		I don't know	3	
29	Have you or other miners ever faced difficulties in obtaining mining related permissions and contracts?	Yes	1	
		No	2	*Skip to Q31.*
		I don't know	3	*Skip to Q31.*
30	If so, what are the difficulties?	_____		*Write down your answer.*
		5. ORE EXTRACTION		
31	How many members does your partnership/group have? (M/F)	Total: ____ Male: ____ Female: ____		*Fill in the blanks. ***Partnership/group is a registered, licensed and informal group of people.****
32	How many members are considered active?	Total: ____ Male: ____ Female: ____		*Fill in the blanks.*
33	Do you work in shifts?	Yes	1	
		No	2	*Skip to Q35.*
34	If yes, how many days do you work in 1 shift?	Days: ____		*Fill in the blanks.*
35	How much ore do you extract in 1 time?	_____		*Fill in the blanks. ***For example: Please indicate by tons or kilograms*** For I don't know enter 0*
36	How many days do you mine before transporting the ore to the processing plant?	Days: ____		*Fill in the blanks.*
37	How many workers are actively working on the ore extraction process until its transported?	Total: ____ Male: ____ Female: ____		*Fill in the blanks.*
38	How many kilograms of ore do you mine per day?	____ kg /day		*Fill in the blank. ***Ex: 100kg, 101-300kg, 301-500kg, 501-800kg, 801-1,000kg*** ***1,000kg=1tonn*** For I don't know enter 0*
39	If you use other measurements such as "sacks", do you know how many kilograms is in per sack on average?	____ kg/sack		*Fill in the blank. ***Ex: 40kg/sack, 60kg/sack, 80kg/sack, 100kg/sack*** For I don't know enter 0*
40	Do you or your partnership/group register and make records of the extracted ore?	Yes	1	*Please select only 1.*
		No	2	
		I don't know	3	

41	What are your biggest extraction challenges? Please rank	Dewatering Lack of exploration Lack of ore supply Lack of equipment Lack of human resource Non-blasting Weather conditions Land permission Lack of capacity Blasting difficulties General permission Lack of finance/funding Other /specify/ _____	1 2 3 4 5 6 7 8 9 10 11 12 13	*Please rank from 1 - 13 (1 being the hardest, 13 being the easiest)*
42	How would you improve your extraction operation if you received more access to capital?	_____		****New equipment (winch, generator, jack hammer, etc.), exploration, etc.****
	6. TRANSPORTATION			
43	Where do you or your partnership/group transport the extracted ore?	Own processing plant _____ km Nearby processing plant _____ km Processing plant in another soum _____ km Home/Fenced area _____ km I don't know Other _____ km	A B C D E F	*Please select all that applies and estimated distance*
44	How do you or your partnership/group transport the extracted ore?	_____		*Write answers. ***Ex: truck, porter, van, sedan, others****
45	Do you have challenges with transportation? If yes, why?	_____		
46	How often is the extracted ore transported from one location to the next phase location?	_____		**** Ex: everyday Once every 3 days Once every 5 days Once every 7 days Once every 10 days Once every 14 days Once every 21 days Once every month Other ****
47	What is the average cost of transporting ore for processing?	_____		*Write answer. ***how much gas/kilometer, gas price****
	7. GOLD ORE PROCESSING			
48	Do you own a processing plant?	Yes No	1 2	
49	How is ore crushed?	By hand, Jaw crusher Hammer crusher Other /specify/ _____	1 2 3 4	*Do not read out answers. ***jaw crusher - the movable jaw compresses material against the fixed jaw, crushing the material to the desired size, hammer crusher - is a rock crusher that blows to shatter and disintegrate a variety of materials.****
50	How is the ore grounded?	Hammer mill Roll mill Ball mill Other /specify/ _____	1 2 3 4	*Do not read out answers.***hammer mills- grinders capable of grinding most dry, free-flowing materials, roller mills - cylindrical rollers, either in opposing pairs or against flat plates, rod/ball mills - to crush or grind various materials, grinds material by rotating a cylinder with steel grinding balls****
51	How is gold extracted from ground ore?	Panning Sluicebox Shaking table Leaching Smelting Amalgamation Other /specify/ _____	A B C D E F G	*Please select 1 - 3 choices. ***see manual, if the miner does not know, you may read out answers.****
52	What percentage is your/your processing plant's gold concentration on average? (Please write down title of your processing plant)	_____		***** For example: 0-100%. Usually the average is 50-70% ***** For I don't know enter 0
53	How many times in a month do you process your ore on average?	_____ _____		*Write answer. ***Ex: 1 time/month, 2-3 times/month, 4-5times/month, more than 5 times/month****
54	How many kilograms of ore do you process in a week?	Up to 200 kg 201 - 500 kg 501 - 800 kg 801 - 1,100 kg	1 2 3 4	*Please select only 1. If more than 1,701kg, write down answer*

		1,101 - 1,400 kg 1,401 - 1,700 kg If more than 1,701 kg /please specify/	5 6 7	
55	How many grams of gold do you get from 1 time processing ore amount?	Ore: Gold:		If you don't know one, mark it with a 0 number
56	Do you or your partnership/group have a processing plant near your operational mine site?	I don't know Yes No	1 2 3	
57	Please name the processing plants you or your partnership/group use and rate them from 1-10.	1 _____ 2 _____ 3 _____ 4 _____	Score:	Write your answer. (1 being the most fair and 10 being the least fair.)
58	How do you determine which processing plant to process your ore at?	Process plant offers financing The nearest processing plant to the mine site Lower price Belongs to partnership/group Have personal contact Have barter terms Mercury free processing plants Gold recovery is high There is no other choice Just following orders Other /specify/ _____	A B C D E F G H I J K	Don't read out answers, please choose 1-3 choices.
59	What would you change to make processing plant structures more fair?	_____		Write your answer.
60	How much gold do you think is left in the tailings?	_____		Write your answer.

8. GOLD PRODUCTION / SUPPLY CHAINS

61	Do you register and make record of the gold sold?	Yes No	1 2	
62	On average, how much gold do you or your partnership/group produce in a week?	_____		Write your answer. ***Reference: 1-5 grams, 6-10 grams, 11-15 grams, 15-20 grams and etc.***
63	What is you or your partnership/group's gold purity level on average?	_____		Write your answer.
64	How do you measure the gold purity?	Have to go to the laboratory Water density measure Rock drawing measure Follow the average purity of the area I trust the gold trader I don't know Other /specify/ _____	A B C D E F G	Don't read out answers, please select 1 - 3 choices.
65	How do you know the gold price rate?	Internet Banks Miners Mine owner Website of Bank of Mongolia Processing plant Gold buyer I don't know Other /specify/ _____	A B C D E F G H I	Please select 1 - 3 choices. No more than 3 choices.
66	To whom do you have the option of selling your gold? If there are more than one buyer per category, please indicate how many?	Gold traders at the mines (#___) Processing plants (#___) Soum gold traders (#___) Aimag gold traders (#___) Ulaanbaatar gold traders (#___) Bank of Mongolia Urt Tsagaan gold traders (#___) Chinese buyers (#___) Local goldsmiths (#___) Commercial banks I don't know Other /specify/ _____	A B C D E F G H I J K L	Don't read out answers, record up to 3 answers. The objective here is to have the miners identify all of the options they have for selling their gold. Be sure to indicate the number of buyers for each catergory. We should be able to calculate the total number of potential buyers.
67	To whom have you sold your gold in the past?	Gold trader at the mines Processing plants Soum gold traders Aimag gold traders Ulaanbaatar gold traders Bank of Mongolia Urt Tsagaan gold traders Chinese buyers Local goldsmiths	A B C D E F G H I	Do not read out answers. Refer to the buyers mentioned in question above if required. Please select all that apply. Please select 1 - 3 choices. ***If possible, please write down the name where they sell their gold***

		Commercial banks	J	
		I don't know	K	
		Others /specify/ _____	L	
68	Whom do you sell your gold most frequently?	Gold traders at the mines	A	*Do not read out answers. Refer to the buyers mentioned in question above if required. Please select all that apply. Please select 1 - 3 choices. ***If possible, please write down the name where they sell their gold****
		Processing plants	B	
		Soum gold traders	C	
		Aimag gold traders	D	
		Ulaanbaatar gold traders	E	
		Bank of Mongolia	F	
		Urt tsagaan gold traders	G	
		Chinese buyers	H	
		Local goldsmiths	I	
		Commercial banks	J	
		I don't know	K	
		Others /specify/ _____	L	
69	Have you ever sold gold to the Bank of Mongolia?	Every time	1	*Most of the time means more than 50% of all sales. If yes, skip to Q71*
		Most of the time	2	
		Rarely	3	
		Never	4	
70	If no or rarely, please select all of the reasons why not.	Too far away	A	*Do not read the answers. Write answer if necessary*
		I don't understand the process	B	
		I don't meet the Bank's requirements	C	
		I don't like the price	D	
		They take too long to pay	E	
		The bank asks for too much information	F	
		I have to fill out too many forms	G	
		Others /specify_____	H	
71	Does the gold buyer provide you with any receipts or documents for the transaction?	Yes	1	
		No	2	
		I don't know	3	
72	How much gold do you sell per week/ month/ season/ yearly?	Week _____ grams		*Write your answer. Enter 0 for I don't know*
		Month _____ grams		
		Seasonally (3 months) _____ grams		
		Yearly _____ grams		
73	Do you receive any support from the local government? Please provide details.	_____		*Write your answer.*
74	Do you currently have any loans?	Yes	1	
		No	2	
75	How do you or your partnership/group finance your mining operation?	Own capital	A	*Please select 1-3 choices.*
		Commercial Bank	B	
		Non-bank financial institution	C	
		Gold traders	D	
		Processing plants	E	
		Pawn shops	F	
		Fellow miners	G	
		Friends and families	H	
		Barter of goods and services	I	
		Others _____	J	
76	What are the challenges in getting a finance?	_____		*Write your answer.*
77	For female interviewees: Are there any specific challenges for women in getting finance?	Yes (specify) _____	1	*Write your answer.*
		No	2	
		I don't know	3	
78	Do you have any financial records?	Yes	1	
		No	2	*Skip to Q80*
		I don't know	3	
79	If yes, Does this help you to secure a loan	Yes	1	
		No	2	
		I don't know	3	
9. OCCUPATIONAL AND TECHNICAL SAFETY				
80	What kind of tools/ equipment/ machinery do you use for ore extraction?	Excavators	A	*Please select all that applies.*
		Rock driller	B	
		Truck	C	
		Loaders	D	
		Electric hammers	E	
		Winch	F	
		Pickaxe	G	
		Crowbar	H	
		Sacks	I	
		Pan	J	
		Wheelbarrows	K	
		Power Generator	L	
		Compressor	M	
		Wench	N	

		Other /specify/ _____	O	
81	Do you or your partnership/group do internal fastening of the mining hole?	Yes No	1 2	Skip to Q83
82	If yes, what is the internal fastening made of?	_____		***ex. types of wood, metal ***
83	How do you or your partnership/group secure the mining hole?	Secure/ cover the mining hole Use warning ribbons Place a warning sign Place a shed over the mining whole Other /specify/ _____	A B C D E	Please select all that applies.
84	Do you wear safety clothes when working in the mine site?	Yes, always Yes, sometimes No	1 2 3	Skip to Q87
85	What kind of safety protective gears do you use?	Full respiratory mask Dust respiratory mask Gloves Helmets Ear protection Eye protection Steel toe shoes Protective suit Other /specify/ _____	A B C D E F G H I	Please select all that applies ***See manual***
86	Where do you get your safety protective gears from?	Buy it yourself Borrow from others Supplied from "mine owner" Other /specify/ _____	1 2 3 4	Please select only 1.
87	Do you receive safety instructions before mining operations?	Yes No	1 2	Skip to Q89
88	If yes, how many times do you receive safety instructions in a month?	days		*** Ex: once a month, twice a month, thrice a month and etc. ***
89	Did you receive any training on Occupational Health and Safety (OHS)?	Yes No I don't know	1 2 3	
90	How well do you follow the OHS standards at the ASGM site?	I strictly follow I try to follow I don't follow I don' know about it	1 2 3 4	
91	Is there any OHS officer in your mining site?	Yes No I don't know	1 2 3	
92	Do you know/observe any mining safety risk in your shaft?	Yes No I don't know	1 2 3	Skip to Q94
93	If yes, what is/was it?	_____		
94	Do you or your partnership/group have safe working procedure and risk mitigation plan?	Yes No I don't know	1 2 3	
95	What safety warning signs do you or your partnership/group place on the mining site?	_____		
96	For female interviewees: Have you ever been pregnant while working in ASGM? If yes, did you take any precautions?	No Never been pregnant Yes, but did not take any precautions Yes, I took precautions /specify/ _____	1 2 3 4	
		10. ENVIRONMENT		
97	How do you or your partnership/group dispose of your rock waste (empty rocks)?	_____		***Ex: pile them up at one place, leave at the mining site, fill in the mining mining hole***
98	Do you have any acid rock drainage issues?	Yes No I don't know	1 2 3	A pit is a steep and narrow hole which is made for ore mining
99	Where do you get your water resource from?	Nearby river/ pond Groundwater Piped manual kiosk Trucked manual kiosk Rainwater Other open water resources Other resources /specify/ _____	A B C D E F G	Please select 1 - 3 choices.

100	What type of waste is disposed in the mining area?	Paper waste Wood waste Plastic waste Battery waste Fuel & machine oil residue waste Chemical waste Mercury waste Other /specify/ _____	A B C D E F G H	*Please select 1 - 3 choices*
101	How do you discharge the waste?	Burning Burying Throw away in the mine site Throw away in the trenches Throw awway in the riverside I don't know Other /specify/ _____	A B C D E F G	*Please select 1 - 3 choices*
102	Where do you store dangerous substances such as fuel, battery, flammable substances?	At mining site Miners' Camp Home Nearby safe storage Other /specify/ _____	1 2 3 4 5	*Please select all that applies*
103	Does your partnership/cooperative have environmental protection and rehabilitation plan?	Yes No I don't know	1 2 3	****Environmental protection and rehabilitation plan - see manual****
104	How do/does you or your partnership/group rehabilitate your mining hole?	_____		****Ex: put up caution signs, tapes and etc.****
	11. TRAINING			
105	Did you participate in any training related to your sector in the last 2 years?	Yes No	1 2	 *Skip to Q108*
106	What was/were the training/trainings that you participated in?	Formalization Responsible and better mining standard Supply chain Business management Financial management Health Environment Rehabilitation Technology Gender and Human rights Organization management Personal development/leadership Other trainings _____	A B C D E F G H I J K L O	*Please select all that apply*
107	Who conducted the training(s)?	_____		*Write your answer.*
108	What kind of training would you like to be a part of?	Formalization Responsible and better mining standard Supply chain Business management Financial management Health Environment Rehabilitation Technology Gender and Human rights Organization management Personal development/leadership Other trainings _____	A B C D E F G H I J K L M	*Please select all that applies.*
	12. WORK, ROLES, DECISION MAKING (GENDER)			
	What kind of work do you perform at the mine?	**109.1 Extraction activities** 1 Operating a winch 2 Going underground 3 Ore extraction 4 Sorting ore 5 Bagging ores 6 Transport ore 7 Blasting 8 Dewatering/pumping 9 Shaft/tunnel construction 10 Exploration 11 Other / specify/ **109.2 Supporting activities** 12 Purchasing food and items 13 Childcare 14 Preparing food 15 Safety and security 16 Dish washing 17 Cleaning	A B C D E F G H I J K K L M N O P	*Please answer all subquestions. ***See manual**** *If the support worker is not involved in the mining extraction*

109		18 Other / specify/	Q	activities, processing mining activities, management activities.
		109.3 Processing mining activities		
		19 Crushing ore	R	
		20 Panning/ washing ore	S	
		21 Grinding gold ore	T	
		22 Smelting	U	
		23 Chemical processing	V	
		24 Gold weighing	W	
		25 Gold record keeping/ data logging	X	
		26 Clean the mills at the processing plant	Y	
		27 Other /specify/	Z	
		109.4 Management activities		
		28 Securing finance	AA	
		29 Equipment/supplies purchaser	BB	
		30 Managing money	CC	
		31 Accounting	DD	
		32 Selling gold	EE	
		33 Safety	FF	
		34 Mine/operations supervisor	GG	
		35 Process plant liaison	HH	
		36 Legal (permits, registration, etc)	II	
		37 Other / specify/	JJ	
110	Are there certain tasks women are not allowed or supposed to perform in ASGM?	_____		*Write answer. *** Ex: not suppose to lift heavy ores, get involved in gold processing, get involved in finance and etc.****
111	Which domestic tasks do you perform at home?	Cooking	A	*Please select all that applies*
		Laundry	B	
		Cleaning	C	
		Care for children	D	
		Care for elderly	E	
		Gather firewood, coal	F	
		Gathering water	G	
		Other /specify/ _____	H	
111.1	How many hours a week do you spend on domestic tasks?	Hours/ a week		*Fill in the blank.*
111.2	Who usually makes decisions about major household expenses in your family? (Such as purchasing cars, housing, livestock, land, school tuitions and etc.)	I decide alone	1	*Please select only 1.*
		My spouse	2	
		I My spouse and I jointly	3	
		My extended family	4	
		Other (specify) _____	5	
111.3	Who usually makes decisions about daily household purchases in your family? (Such as groceries, clothes, furniture, meat and etc.)	I decide alone	1	*Please select only 1.*
		My spouse	2	
		I My spouse and I jointly	3	
		My extended family	4	
		Other (specify) _____	5	
111.4	Who usually makes decisions about visits to family or relatives in your family? (such as visiting elders, in-laws, visiting on holidays and etc.)	I decide alone	1	*Please select only 1.*
		My spouse	2	
		My spouse and I jointly	3	
		My extended family	4	
		Other (specify) _____	5	
112	At the mining site, are you usually involved in the decision making process in the following acticities? (read out answer categories)	Exploration/Access to mineral deposit	A	*Please select all that applies*
		Administrative management/coordination	B	
		Ore Extraction (Mining)	C	
		Ore Processing	D	
		Profit distribution	E	
		Selling	F	
		Registration traceability	G	
		Waste disposal	H	
		Access to finance	I	
		Other _____	J	
113	Did you have any of the following problems at your work?	Discrimination	A	*Please select all that applies. Read out answer categories.*
		Work place conditions	B	
		Value of labor	C	
		Violence	D	
		Harassment (in general)	E	
		Sexual harassment	F	
		Alcohol abuse	G	
		Chemical poisoning	H	
		Safety at work (Accidents and injuries)	I	
		Crimes	J	
		Income insecurity	K	
		Unfair pay	L	
		Other/specify/ _____	M	
13. INFORMATION SOURCE ARTISANAL MINERS				
114	What is your information source regarding ASGM or relative information?	Family/friends/ relatives	A	*Please select 1 - 3 choices.*
		Public organizations / government	B	
		NGOs	C	
		Someone in the mining business (e.g. miners)	D	
		Media	E	
		Other /specify/ _____	F	
		Newspaper	A	

115	What type of communication tools do you mostly use?	Television Radio Facebook Twitter Other social media tools Via messages By mobile phone Word of mouth Websites Other /specify/	B C D E F G H I J K	*Please select all that applies.*
116	What kind of information related to ASGM would you like to have?	_____		*Write answer.*
117	Do you know ASM Knowledge Hub? (www.asmhub.mn)	Yes No	1 2	 Skip to Q118
118	If yes, have you ever engaged with ASM KH? Profile created on KH, B. Accessed to receive information?	_____		
	14. COVID - 19			
119	Has the coronavirus pandemic affected your ASGM operations? If yes, how?	Yes /specify/ _____ No	1 2	****examples: income/selling gold , production, supply of fuel, mercury, etc. ****
120	Have you taken any precautious measures at the mine site?	Yes /specify/ _____ No	1 2	****examples: spatial distancing, hand washing stations, disinfecting tools****
121	Has the coronavirus pandemic affected your livelihoods? If yes, how?	_____		****examples: food security, work load at home, no child care****
122	Do you feel that you have received enough information about COVID-19 that you know how to protect yourself?	Yes /specify/ _____ No	1 2	
	15. MERCURY QUESTIONS			
123	Have you seen mercury being used to extract gold in last two years in your Aimag?	Yes No I don't know / I don't want to say	1 2 3	*Observe respondents behaviour. Write down how they speak.*
124	Are you aware about any mercury being sold in your Aimag?	Yes No I don't know / I don't want to say	1 2 3	*Observe respondents behaviour. Write down how they speak.*
125	Do you know that mercury is toxic for humans?	Yes No	1 2	*Observe respondents behaviour. Write down how they speak.*
126	If yes, how does it affect human health?	Neurological system/brain Kidneys Cardiovascular system/heart Affects development of developing fetuses Other /specify/ Don't know	1 2 3 4 5 6	*Do not read out answers.*
	THANK YOU FOR COMPLETING OUR SURVEY.			

11.2 Annex B: List of Key Informant Interview Organisations

Ulaanbaatar	Mandal Soum, Selenge Aimag	Bayangol Soum, Selenge Aimag	Tunkhel bagh, Selenge Aimag	Yusunbulag (Altai Soum), Gobi-Altai Aimag	Altai Soum, (Jargalant soum) Khovd Aimag
	Local Governor	Local Governor	Local Governor	Local Governor	Local Governor
Artisanal and Small-Scale Mining National Federation (ASM NF)	Local ASGM NGO	-	Local ASGM NGO	Local ASGM NGO	Local ASGM NGO
	Aimag ASGM NGO				
Ministry of Mining and Heavy industry	Aimag Inspectors (Mining)			Local Inspectors (Mining)	-
--	Soum Police Department	Soum Police Department	-	Soum Police Department	Aimag Police Department
Ministry of Environment and Tourism (MET)	Soum Environmental Officer	Soum Environmental Officer	-	Soum Environmental Officer	Aimag Environmental Officer
	Aimag Environmental Officer				
Mineral Resources and Petroleum Authority	Aimag Investment and Planning Officer			Local Mining Specialist	Aimag Mining Specialist
National Human Rights Commission	Aimag Social Welfare Officer			-	Social Worker
-	Local Processing Plants	Local Processing Plants	Local Processing Plants	Local Processing Plants	-
-	Gold Traders	Gold Traders	Gold Traders	Gold Traders	Gold Traders -
-	-	Local Community Representatives (e.g., herders and residents)	-	Local Community Representatives (e.g., herders and residents)	Local Community Representatives (e.g., herders and residents)
-	-	Local Environmental Activists	-	Local Environmental Activists	Local Environmental Activists
-	Local Health & Social Insurance Offices	Local Health & Social Insurance Offices	Local Health & Social Insurance Offices	Local Health & Social Insurance Offices	Local Health & Social Insurance Offices
-	-Aimag NGOs (Women)			Local NGOs (Women)	Local NGOs (Women)
-	-	Local ASGM NGO Member	-	Local ASGM NGO Member	Local ASGM NGO Member
-	-	Local Processing Plants worker	-	Local Processing Plants worker	-
-	Social Policy Specialist	Social Policy specialist	-	Social Policy specialist	-
-	Partnership Leaders	-	Partnership Leaders	Partnership Leaders	Partnership Leaders (2)
-	ASM Partnership Members	ASM Partnership Members	ASM Partnership Members	ASM Partnership Members	-

11.3 Appendix C: Key Informant Interview Questions

Face-to-face Interview Structure Introduction

- The one-on-one interview will last approximately for an hour.
- Please fill out the participant information form.
- You should exchange ideas freely and not limit yourself to the research questions
- Please turn off your cell phone or put it on silent mode.

Profile of face-to-face interview participants

	NAME:	
	GENDER:	
	AGE:	
	CONTACT NUMBER:	
	E-MAIL ADDRESS:	
	NAME OF ORGANIZATION:	
	EMPLOYMENT DURATION:	
	POSITION:	
	INTERVIEW LOCATION:	
	DATE:	
	START TIME:	
	END TIME:	
	INTERVIEWER:	

The purpose of this research is to study mercury use, occupational safety, mining, environmental, socio-economic and gender aspects of the ASGM sector in the target areas of planetGOLD Mongolia Project. The confidentiality of this questionnaire shall be strictly maintained in accordance with the Law of Statistics and the Law on Individual Privacy and shall be used solely for research purposes.

Key Informants at National Level

1. Ministry of Environment and Tourism

Questions:

1. Could you please share general information on the current ASGM situation?
2. How do you see the main issues in this sector?
3. Do you put control on the proper use of local funds for rehabilitation? And how?
4. What is the status of implementation of the NAP? What would you suggest to stakeholders to better/effectively implement NAP?
5. Share information/data on the locations with high mercury use? What is the current mercury use in weight and in regions?
6. How do you measure mercury use? Do you have special equipment/tools to measure mercury use?
7. In your opinion what should be done to ban/reduce mercury use?
8. Do you organize or plan to organize any promotion/events/activity to reduce mercury use and how?
9. In your opinion, what are the training needs for miners? Do they need trainings on formalization, environmental and social monitoring, OSH, impacts of Hg, gold supply chain management, gender and legal administrative issues (training needs for who? Please specify)
10. Do you have any further training needs within the planetGOLD project?

2. National Human Rights Commission of Mongolia

Questions:

1. To what extent is gender adequately mainstreamed in existing policies and programs on ASGM?
2. To your best knowledge, do you think that gender related policies and programs are adequately implemented in Mongolia? What are key challenges and facilitators to implement those policies and programs, specifically in the mining sector?
3. To your best knowledge, what are the key issues faced by small scale miners (both men and women)?
4. In your opinion, what are the impacts from ASGM activities on the environment, human health and surrounding communities?
5. In your opinion, what are the gender-related training needs for miners? Please give us subjects you would suggest for further training of the small-scale mining population.

6. In your opinion, what are the gender-related training needs for government officials? Are there any recommendations or lessons learned for gender training?

3. Gender Focal Point at the Ministry of Environment and Tourism

Questions:

1. To what extent is gender adequately mainstreamed in existing policies and programs on ASGM?
2. To your best knowledge, do you think that gender related policies and programs are adequately implemented in Mongolia? What are key challenges and facilitators to implement those policies and programs, specifically in the mining sector?
3. To your best knowledge, what are the key issues faced by small scale miners (both men and women)? Are there specific challenges or barriers women miners are facing?
4. To your best knowledge, who are the most vulnerable groups based on gender division of labor in ASGM with focus on mercury use, handling and disposal?
5. In your opinion, what are the impacts from ASGM activities on the environment, human health and surrounding communities?
6. Have you attended gender related training (specifically in the ASGM sector) over the past 2 years?
7. In your opinion, what are the training needs for miners? Please give us subjects you would suggest for further training of the small-scale mining population.

4. Gender Focal Point at the Ministry of Mining and Heavy Industry

Questions:

1. How is the ASGM sector considered in current gender related policies and programs?
2. To what extent is gender adequately mainstreamed in existing policies and programs on ASGM?
3. What is the general ASGM situation?
4. What are the key issues that exist in the ASM sector? Are there any existing barriers and facilitators for women and men to acquire better mining practices (access to information and training, to formalize and professionalize ASGM activities, to access finance and technology)?
5. To your best knowledge, who are the most vulnerable groups based on gender division of labor in ASGM with focus on mercury use, handling and disposal?
6. What is the gender situation in the sector? Any issues?

7. Is there any further policy/measure planned to be implemented related to gender on ASGM sector?
8. What's the average gold ore produced annually on the ASGM site (ton/y/site)?
9. What's the average gold ore produced annually on the LSM site (ton/y/site)?
10. Have you attended gender related training (specifically in the ASGM sector) over the past 2 years?
11. In your opinion, what are the training needs for miners, especially in respect to gender? Please give us subjects you would suggest for further training of small-scale mining population

5. National Federation for Artisanal and Small-Scale Mining

Questions:

1. What is the general ASGM situation currently?
2. What are the main issues in the sector, including gender (gender division of labor, most vulnerable groups on mercury use, handling, disposable and health issues)?
3. What is your recommendation to improve the current situation?
4. Please share with us the general ASGM data (formal and informal), number of miners (men/women) and minors?
5. Could you please share with us information on miners' gold extraction, processing technologies? Miners' earnings data, revenue distribution between stakeholders/miners, and gender differences?
6. What's the current use of mercury in the sector? Are there any data on its impacts on the environment, and human health?
7. How difficult is it to get the land permission for the mining organization? What's the average period for getting the permission? What's your recommendation for improvement?
8. Can you please describe how work is distributed among men and women miners at mine sites?
9. Do you see any differences between women and men in accessing resources (equipment, knowledge, loans, information) to perform their job? In addition to that, if there are differences in accessibility to information for different genders, please identify which platforms are most available for women and men (word of mouth, TV, internet, social media, radio etc.)
10. Can miners access health and social services in neighboring communities? What kind of difficulties do they face? What can be done better?
11. In your opinion, are there any barriers for men and women to acquire better mining practices?

12. Please share with us how decisions are made among miners? Can women have the same voice in making decisions within partnerships, for example?
13. Do you have any strategy and plan to reduce mercury use in ASGM?
14. Do you organize any promotion/events/activity to reduce mercury use and how? if yes, any short- and long-term plan and budget for the activities. How effective are these activities? How well are these activities received by ASM communities and the public?
15. In your opinion how to reduce/ban the mercury use?
16. Do you have any training needs? (any different topics for men and women)

Key Informants in the Study Areas

1. Local Governments

Questions:

1. What is the general mining situation in your area?
2. What's the number of active ASGM sites / number of miners permitted and non-permitted?
3. What's the number of LSM and number of workers?
4. What's the number of processing units and workers permitted and non-permitted?
5. What's the average gold ore produced annually on the ASGM site (ton/y/site)?
6. What's the average gold ore produced annually on the LSM site (ton/y/site)?
7. What is the positive and negative impact of ASGM (social and economic)?
8. What are the environmental impacts of ASGM in this area? Is there any use of mercury? Use of other chemical substances for ore leaching?
9. What is the total amount of ASM area rehabilitated (sq.m)? What is the total amount of ASM area needs rehabilitation (sq.m)?
10. Are there many accidents and injuries at ASGM sites? What types of accidents and injuries? How many fatal accidents happened in this area in the last 12 months? Are there many problems with OSH standard violations at ASGM sites?
11. How many ASM mining land requests do you receive per month and what is the average period to completely resolve the request?
12. Do the permitted ASGM have environmental protection and rehabilitation plans?
13. How do you put control on the implementation of the rehabilitation plans?
14. How is the rehabilitation fund used for?
15. How do you put control on illegal ASM and use of mercury?

16. Do you have any local strategy and plan to reduce illegal ASM and mercury use in ASGM?
17. Do you plan to invest in mercury free technology in your area?
18. In your opinion, what are the training needs for miners? Do they need trainings on formalization, environmental and social monitoring, OSH, impacts of Hg, gold supply chain management, gender and legal administrative issues?
19. Do government officials have any training needs related to formalization, environment and monitoring and gender and legal administrative issues in ASM sector?

2. Local ASGM NGO Leaders, Members and Workers

Questions:

1. Please explain the main issues in the sector.
2. What's the ASGM data (number of partnerships/ members by gender, any minors)?
3. What's the organizational structure of miners (shaft owners, landowner, partnership member, miner, salaried worker, gender-disaggregated)?
4. Do you know what makes ASGM as permitted, non-permitted and illegal?
5. Are there any challenges to get land permission?
6. What's your recommendation for improvement?
7. At what extent do you cooperate with the local authorities? Do they support ASM activities and how?
8. Can you access loans to formal financial institutions? If yes, what institution and what did you use it for? If not, why? If you can get a loan what will you use it for?
9. In your opinion, does it have any barrier for men and women to access loan?
10. Do you have any financial records as NGO?
11. What type of social services do you access to locally? (education, health, childcare).
12. What's the most common social services necessary for ASGMers?
13. Are there any challenges related to the accessing to social services?
14. Do your organization have an environmental rehabilitation plan? How do you implement the rehabilitation plan?
15. Do you allocate the rehabilitation fund every year?
16. In the organizational structure, who is mainly responsible for enforcing and overseeing the compliance of OSH standards?
17. What's your views and thoughts on mercury use?

18. Who are the most vulnerable groups (for men, women and children) on mercury use based on gender division of labor?
19. What's your recommendation for reducing mercury use?
20. Do you receive any complaints and comments from partnership members and miners? How often and what type of complaints and comments and how do you resolve these?
21. Can you please describe how work is distributed among men and women miners at mine sites?
22. What is the overall gender situation at your mining site? Do women and men have the same rights and opportunities, or do women and men face challenges in terms of access to finance, technology, information, training and formalization?
23. Cases of gender-based violence including domestic violence (if any)
24. Are there any challenges for female miners to deal with the local mining authority?
25. In your opinion, what's responsible ASM?
26. Training needs: Do you have any training needs (if different for women) on formalization, environmental and social monitoring, OSH, impacts of Hg, gold supply and chain management, gender and legal administrative issues. Are there any specific training needs for women and men in the ASGM sector?
27. Are ASM communities negatively portrayed? How would you like to be portrayed, so that your work is dignified?

3. Miners Groups at the Extraction Level (Including partnership leaders)

Questions:

1. Why do you engage in ASM? Is there any other employment and business opportunities?
2. What's the typical challenges in ASGM?
3. Please explain your daily workflow in the mine site including the extraction process.
4. Please explain the roles of each workers in the extraction process.
5. Do you have a work/employment contract?
6. What's your average monthly mining income? How do you share the mining income? Is the amount different at similar roles for men and women?
7. How do you get paid for your gold?
8. What do you usually spend your mining income for?
9. Does your ASGM have a land permit? What main difficulties do you face to get the land permission? What were the costs? How long did permits take to acquire

10. What's the common type of equipment /tool/machinery of ASGM and what's their capacity?
11. Do you use blasting operations in mining exploration? Do you have blasting permission?
12. If Yes. How do you organize blasting operations? Doing for ourselves or rent a permitted entity?
13. How you and miners comply with safety and security standards/regulations? What type of protective uniforms, gadgets and tools you use? The quality and durability of the safety gadgets. How often are gadgets replaced to ensure safety? Have you ever concerned for your safety for any reason?
14. Do you receive training in safety at mine site?
15. Do you receive any safety instructions at mine site? If so by whom? Frequency?
16. How do you ensure the safety of winch operation?
17. Is there any cases (number) of injuries and accidents? how often?
18. Is there an ore processing unit in your area?
19. What's the estimate of ore extraction kg/ton /sacks and per day/week/month?
20. Please explain how you process gold. Is mercury amalgamation used?
21. When dealing with processing plants, what are the fees and profit-sharing structure?
22. What's the process of producing the final product?
23. What's the average gold production estimate per day/week /month and per miner/partnership?
24. Where/to whom do you sell your gold and why? What's the frequency?
25. What is the gold grade of your shaft? Rough gold amount you recover from per sack or ton after processed?
26. Do you have an environmental evaluation conducted at your mine site?
27. How do you protect the soil, water source in the mine site area?
28. Do you have an environmental rehabilitation plan? How do you implement the rehabilitation plan?
29. Do you allocate the rehabilitation fund every year?
30. Is there any investment made in the mining site? If yes, do you know the total amount of investment made in the mining process, areas of investments, and number of beneficiaries from the investment over the past 3 years?
31. Is there any need to invest in equipment, ore extraction, safety tools etc.?
32. Does your partnership have the ability to finance the mining extraction process?
33. Do you have any plan to establish a processing plant?

34. If you already invested in the processing plant what's the total amount of investment made in the processing plant, areas of investments, and number of beneficiaries from the investment over the past 3 years? And what's the future investment needs (types of equipment, processing stage)
35. Can you access loans to formal financial institutions? If yes, what institution and what did you use it for? If not, why? If you can get a loan what will you use it for?
36. Social services: what type of social services do you have access to? (education, health, childcare). Are there any challenges related to the social services? How do you receive information of the social services? From local government, communities, media etc.
37. Can you please describe how work is distributed among men and women miners in your partnership?
38. What is the overall gender situation at your mining site? Do women and men have the same rights and opportunities, or do women and men face challenges in terms of access to finance, technology, information, training and formalization?
39. Cases of gender-based violence including domestic violence (if any)
40. How does the season affect your productivity and capacity?
41. In your opinion, what's responsible ASM?
42. Training needs: Do you have any training needs (if different for women) on formalization, environmental and social monitoring, OSH, impacts of Hg, gold supply and chain management, gender and legal administrative issues. Are there any specific training needs for women and men in the ASGM sector?

4. Gold Traders

Questions:

1. How long have you been working as a gold trader?
2. What is the amount of gold you purchased daily/weekly/monthly?
3. What's the price of gold purchased/sold? How do you set the price?
4. What are the types of gold purchased (whether it is flake, powder, sponge gold, or doré)?
5. Do you register or make notes on the gold purchased by name/location/purity etc.?
6. What is the gold purity/grade in your area?
7. From how many different miners do you purchase gold?
8. What tools and equipment do you use to measure the gold purity when you purchase gold?
9. Do you ask your client how they process their gold?

10. Do you provide loans to miners/ASGM partnerships?
11. What other support/services do you provide to miners/ASGM partnerships?
12. Do you have any training needs related to your current work?
13. To whom do you sell your gold?
14. How often do you sell your gold?
15. What is the most amount of gold you are able to purchase before selling?
16. Have you ever sold gold to the Bank of Mongolia?
17. If yes, what information, documents or forms did you have to submit to the Bank of Mongolia?
18. Does the bank of Mongolia ask you for evidence about the origin of the gold?
19. Are there any gold buyers who pay a better price then the Bank of Mongolia?
20. What is your opinion on the Bank of Mongolia's gold buying conditions (in terms of the price, the payment timing, the payment method, the process etc.)?
21. Do you have any recommendations for the Bank of Mongolia to improve their gold buying?
22. Do you have gold trade permission?
23. Are you aware of the new gold trader accreditation regulations?
24. If yes, are you going to apply for accreditation?

5. Local Processing Plants

Questions:

1. How do you process gold ore? Please explain the ore processing method / flow diagram (what chemical and toxic substances used at what stage of method)? Refining (smelting) process details and used chemicals details and consumption? How do you buy it and how much is the price? Do you know the side effect of these chemicals? Where do you dispose of chemical waste after refining? How do you store them at the plant?
2. Net equipment price? Where did you buy them?
3. How much time and money did you spend on processing plant permitting and construction?
4. How do you and miners comply with safety and security standards/regulations? Is there any safety risk at your premises?
5. How many employees work at your facility and what are their roles? How are employees paid and what benefits do they have? Are miners involved with processing activities?

6. What's the amount of ore processed daily/weekly/monthly?
7. What's the amount of gold produced/smelted daily/weekly/monthly?
8. What's the number of miners/customers/daily/weekly/monthly?
9. What is the processing fee at your facility?
10. What is the cost of processing per ton ore?
11. How much is the operation cost of processing daily/monthly? Electrical, water, chemicals...etc.
12. How much water and electricity is used daily/weekly/monthly? Are there any challenges with utilities shortages?
13. How many percent of gold recovery when a plant runs?
14. Details on tailings operation? After processing the miner's ore, how do you organize plant tailing? Give back to the miners or sell it to a gold cyanidation plant or other method…?
15. If sells to the gold cyanidation plant, how much do you earn from per ton?
16. How much tailings is produced daily/weekly/monthly? (This number should match with Q5)
17. Tailings pond dimension and type details? How do you make arrangements for your tailings during winter? Do you reuse water as circulation from tailings pond?
18. What kind of permissions and official documents were acquired? For example: Land, Electricity, Water well, Environmental, Chemical, Feasibility study…etc.
19. Is your facility allowed to conduct cyanide leaching? Why or why not? Have you ever tried to acquire a cyanide permit? What are the biggest barriers? Would you like to conduct cyanide or any other type of chemical leaching at your facility?

6. Large Scale Mining Companies

Questions:

1. What's the name and location of LSM sites?
2. What's ore processing method / workflow (what chemical and toxic substances used at what level of method) if possible?
3. What's the amount of ore processed daily/weekly/monthly?
4. What's the typical ore grade range?
5. What's the typical gold purity range?
6. What's the map or knowledge of ASGM? Which news and information sources do you trust the most in case of the ASGM?
7. Do you cooperate or intend to cooperate with ASGM?

8. Any history of conflict with ASGM, if any?
9. If you buy small scale gold processing plant's tailings, how do you do the sampling process for it? How much is the price of a ton tailing?

7. Local Environmental Inspectors

Questions:

1. Could you please share general information on the current ASGM situation?
2. What are the main issues in this sector?
3. What's the total areas (number/sq. km/partnership) with land permission in the study areas?
4. What is the number of permitted and non-permitted miners as per target areas and in general?
5. What is your current policy/strategy/plan to reduce the non-permitted ASGM?
6. What is your further policy on controlling the proper use of permitted lands of ASGM?
7. Could you please provide us information on locations on the environmentally impacted ASM areas in the study areas?
8. What is the total amount of environmentally impacted ASM areas in your areas?
9. What is the total amount of ASM area rehabilitated (sq. m)?
10. Do you put control on the proper use of local funds for rehabilitation? And how?
11. At what extent do you cooperate with the Ministry of Environment? Do you have any national/aimag/local policy, strategy and plan to reduce/ban mercury use?
12. Do you organize any promotion/events/activity and how?
13. Do you have any training needs within the planetGOLD project?

8. Local Health & Social Insurance Offices

Questions:

1. What's the number of partnership members/miners who paid social and health insurances?
2. How much do they pay for social insurance contribution per month on average (to pay from the minimum wage or above than that)?
3. Types of health and social service that miners receive?
4. To your best knowledge, who are the most vulnerable groups on health related to mercury use or other chemical substance use? (men, women or children). Why?

5. Do miners suffer any occupational diseases due to their mining work?

9. Social Policy Officer or /Social and Welfare Officers/

Questions:

1. What are social issues faced by miners? Are they different for women and men?
2. Are there any cases of gender-based violence including domestic violence in your community? What about miners? In your opinion, what are the reasons?
3. How many miners have access to social welfare services? Any issues with access by men and women?
4. In your opinion, what are constraints and challenges for ASGM miners? What can be done better to provide opportunities for miners' population? Are the ASGMrs discouraged to reach out for social services due to their negatively perceived occupation?
5. Do you have suggestions on training topics for miners? Can you give us few examples?

10. Local Environmental Activists

Questions:

1. Could you please share general information on the current ASGM situation?
2. What are the main issues in this sector?
3. Could you please provide us information on locations of the environmentally impacted ASM areas in the study areas?
4. In your opinion, what are the impacts from ASGM activities on the environment, human health and surrounding communities?
5. What is the mercury reduction strategy plan of the Ministry?
6. At what extent do you cooperate with the Ministry of Environment? Are you aware of strategy/plans of the ministry on the reduction of mercury?
7. Do you have any training needs within planetGOLD Project?

11. Local Community Representatives (e.g. herders and residents)

Questions:

1. To what extent do you know about ASGM?
2. Have you ever participated in ASGM activity?

3. Do you know the location of ASGM sites?
4. Are there any positive and negative impacts of ASGM?
5. What are the main impacts?
6. Are there any conflicts with ASGM in your community?
7. In your opinion, what are major issues related with ASM in your communities? Why do you think so?

12. Local Non-governmental Organizations (gender focused)

Questions:

1. What are gender-related issues in your community? In your opinion, what different roles women and men assume in society? And in the household?
2. To your best knowledge, what kind of work female miners do at mine sites?
3. In your opinion, what are major issues related with ASM in your communities? Why do you think so?
4. Do you think women and men have the same access to assets and resources (e.g., financial resources, equipment, information, equipment and tools)? Why do you think so?
5. What are constraints for men and women in getting access to health and social services? How can the situation be improved?
6. In your opinion, how disadvantaged groups, including women, can be empowered? What CBOs can do in this regard?
7. Training attended over the past 3 years (areas/subjects)
8. What gender-related training would you like to attend? Can you suggest a few topics?
9. What topics should be included in gender training for ASGM communities?

13. Local Agency for Specialized Inspection

Questions:

1. What's the general information on ASGM activities?
2. Please provide us the ASGM data on mercury illegal import cases/location
3. How do you identify and measure mercury use?
4. How many specialists/workers work per aimag and soum dedicated for soum/bagh?
5. Any monitoring report on Environmental protection and rehabilitation plans in the target ASGM areas?

6. Is there any report on injuries and accidents due to non-compliance of OSH in ASM areas? If there were accidents, please provide yearly stats in the areas on type of injury, death rate and cause of accident.
7. Any information to share on the locations with high mercury use?
8. What is the current mercury use in weight and in regions in accordance to your data?
9. How do you measure mercury use? Do you have special equipment/tools to measure mercury use?
10. Do you have any local strategy and plan to reduce mercury use?
11. Do you organize any promotion/events/activity to reduce environmental impact including mercury use and how and frequency? If yes, what are the main messages? How do you balance the negative or in other words fear mongering consequences of mercury use with any positive outcomes of avoiding mercury?
12. In your opinion how to reduce/ban the illegal mercury use?
13. In your opinion, what are the training needs for miners? Please give us subjects you would suggest for further training of small-scale mining populations.
14. Recommendation for further action for improvement

14. Local Police Agency

Questions:

1. What's the general information on ASGM?
2. Can you please explain what is the role of eco police in general, and specifically in connection to ASGM, if applicable?
3. Please provide us the ASGM data on mercury/cases/location/contraband
4. What is the general crime rate, including gender-based violence project target areas?
5. Any recorded violent cases related to the ASGM sector, tendency?

11.4 Annex D: Methodology for Gender In-depth Study

IN-DEPTH STUDY ON GENDER IN THE ARTISANAL GOLD MINING SECTOR IN MONGOLIA

Objective of the in-depth interview

During the field data collection of the Contextual Study, the planetGOLD project staff conducted a separate, embedded study with focus on gender in order to identify main challenges faced by women miners in ASGM communities regarding different aspects of ASGM including leadership and decision making powers, income division at work and home, accessibility of self-development/training, gender-based violence and discrimination, health issues and alcohol related issues which may not be fully exposed during the Contextual Study survey and Key Informant Interviews. Due to the sensitivity of these topics, data generated through a standardized questionnaire can be biased since women can feel uncomfortable to answer questions in a formal interview situation. It was therefore decided to address these topics in separate, semi-structured in-depth interviews, conducted by a woman interviewer.

An in-depth interview is an open-ended, discovery-oriented method to obtain detailed information about a topic from a stakeholder. In-depth interviews are a qualitative research method; their goal is to explore in depth a respondent's point of view, experiences, feelings, and perspectives[24]. The interviews also focused to expose opportunities and benefits for women miners working in ASGM in the project areas. Moreover, these interviews are important relationship building experience between the Project and the mining communities.

To reach the objective, the interviews were conducted under the following structure:

- Main challenge and advantage for women miners in ASGM
- Decision making and control over resources
- Occupational health issues
- Knowledge gaps and training needs
- Gender based violence and discrimination

Sampling strategy and in-depth interview guide

Developing sampling strategy: Women miners were identified as interviewees during the Contextual Study quantitative surveys among artisanal miners based on their interest in the gender topic, experience/information to share on gender in ASGM and/or increased level of awareness on the topic. An interviewer (the project staff) asked those women

[24] Workbook E: Conducting In-depth interviews

whether they had an interest to speak further about gender in ASGM. The sample size for each site and estimated time are shown below:

- Targeted sample size for each of the 5 study areas: 6 women.
- Expected duration for each interview: 30 min

The in-depth interviews were conducted in 5 study areas including Mandal, Bayangol soums and Tunkhel village of Selenge aimag, Altai and Jargalant soums of Khovd aimag and Yusunbulag soum of Gobi-Altai aimag and in total 30 women miners participated in the separate interviews (see table 1).

In-depth interview guiding questions: An in-depth interview guiding question is a method for structuring an interview and ensuring that all important topics will be addressed during the interviews[25]. Therefore, the project team developed guiding questions for the in-depth interviews based on a gender analysis on gender issues in the sector in Mongolia (internal report) and information collected during the site visits (internal report). Above all, the team attempted to develop good guiding questions based on the following essential strategies for the in-depth interviews:

- Open-ended questions were asked to reveal what respondents were thinking
- Effective probing questions were used for probing greater detail or expanding upon earlier responses
- The guiding questions were simple to make respondents understand easily
- The interviewers were cautious about giving examples as it can bias respondents' responses.

Based on these strategies, the team prepared the guiding questions with the support of the Health and Gender Program Manager at the Artisanal Gold Council Head Office. The detailed guiding questions were categorized into five sub-categories as outlined in figure 1:

Figure 1: Guiding questions for the in-depth interviews

1. Main challenges and advantages for women miners in ASGM

1. What general challenges to you face in ASGM? Do you face any specific challenges as a woman? For example, are there any tasks you are not allowed to perform in AGSM because you are a woman? Or are there certain tasks you feel uncomfortable doing? Are there any customary laws of beliefs?
2. What are general opportunities/ benefits for women working in ASGM? Have you experienced that?
3. Are you comfortable in dealing with local mining authorities?

2. Decision making and control over resources

4. Is there any difference between men and women in participating in decision-making at the mine site? Do you or other women face any constraints in decision making?

[25] Workbook E: Conducting In depth interviews

5. Is there any difference between men and women in revenue sharing or when negotiating fair prices?
6. Do you or other women face any constraints in decision making within the household?
7. Do you have the same access to working materials and tools as men at the mining site?
8. Do you have access to finance? Is there any difference between men and women in accessing finance?

3. Occupational health issues

9. Are there specific health risks for women in ASGM? What are those? Are there certain tasks you feel uncomfortable doing?
10. Do you know whether mercury is used at your mining site?
11. Are you aware that mercury is toxic, and can specifically harm be developing fetuses and children?

4. Needs/training

12. Is it possible for you to have access to information and training?
13. What are things you would like to learn to improve your self-development skills including business, financial, health and gender knowledge, etc.?
14. How should a training look like that women can get profit from?
15. Is there any other support you would need to strengthen your position as woman miner (e.g., while dealing with authorities)?

If a respondent is comfortable with sharing information, sensitive topics can be addressed.

5. Gender-based violence and discrimination

16. Have you heard/seen women who faced gender-based violence (at the work site/at home) or discrimination? Can you explain why this was happened?
17. In your opinion, what things should be done at work or home to deal with the issues?
18. Does excessive drinking or drug abuse pose a problem at the mining site or in this community? If so, how?

Conducting the In-depth Interviews at the Study areas

The project team organized individual interviews in 5 study areas (Mandal, Tunkhel, Bayangol soums, Selenge aimag; Altai and Jargalant soums, Khovd aimag; and Yusunbulag soum, Gobi-Altai aimag). Since it is important to create a comfortable interview atmosphere for in-depth interviews, the interviews were conducted in a suitable and comfortable environment for the respondents. There were 4 project staff (women staff), appointed to conduct the interviews in different areas. Those interviewers received a guidance on how to conduct the interviews along with guiding questions from the project gender specialist to streamline the interview process and ensue comparability of results.

Methodological considerations on gender-related data collection are also outlined in the planetGOLD gender guideline (internal project document).

According to the guidance, some key strategies to conduct the interviews successfully were introduced such as being active listeners during the interviews, showing patience and using the guiding questions in a flexible manner in order to not interrupt the flow of the conversation. Since the in-depth interviews were conducted at the same day as the quantitative survey due to time constraints, some women were reluctant to stay longer for the in-depth interview. However, most of the respondents recognized the time constraints of the research team and agreed to the interview. As a result, the interviewers were able to successfully conduct the interviews with women miners and reached the targeted sample size of 30 women miners in 5 target areas.

Table D-1. Number of women miners participated in the interview at targeted sites

Aimag	Soum	Number of interviewed women miners
Selenge	Mandal	5
	Bayangol	5
	Tunkhel	6
Khovd	Altai	5
	Jargalant	3
Gobi-Altai	Yusunbulag	6
Total		**30**

The interviewers used a voice recorder to record the interviews after having received verbal consent for the interviewees. With the respondents' permission, all interviews in the five study areas were audio-recorded. The interviews were later transcribed for qualitative data analysis.

Analyzing the in-depth interviews

The data analysis was conducted as follows:

1. Review all records of the interviews and doing a transcript from the audio recordings;
2. Organize notes by coding data according to main topics and cohesive categories;
3. Copy and paste all the interviews notes into a single document;
4. Assign codes by locations and respondent numbers on a Spreadsheet;
5. Categorize each respondent's note in accordance with questions (18 questions for each respondent) on the Spreadsheet; and
6. Sorting and grouping the categorized notes and summarize each of these categories in line with objectives of the in-depth interviews.

The objective of the data analysis was to capture patterns in the responses, i.e., in how far answers to the 18 questions were similar or did differ. Thereof, the data analysis is focused on essential points such as frequency and extensiveness, intensity, and specificity of the respondents' responses.


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