

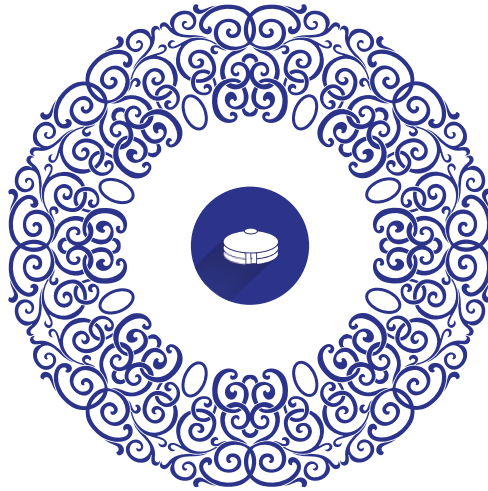
# Responsible Mining in Mongolia: Enhancing Positive Engagement



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Managing the impacts of minerals development on women and men and their traditional livelihoods in Mongolia.*







# Responsible Mining in Mongolia:

## Enhancing Positive Engagement

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## Executive Summary

Mongolia is a country in transition, with recent ecological, social and economic changes having a dramatic influence on its development trajectory. With the exponential growth of the mining industry, Mongolia faces serious challenges in managing the environmental impacts on its natural resources and the social impacts on its people. Part discussion paper, part handbook, this document aims to bridge the gap between the current understanding of the impact of mining on Mongolian herder communities, in particular the different impacts on women, men and their traditional livelihoods. It also offers several recommendations for how local government, national government, mining companies and developers operating in Mongolia can translate these findings into actions that will support responsible minerals development in the future.

### The role of mining in Mongolia

Mongolia's mining industry has grown dramatically since the early 2000s, and in 2014, the industry expanded to represent around one quarter of Mongolia's gross domestic product. Mining is set to remain critical to the country's future, with the World Economic Forum rating Mongolia as having one of the highest potentials for contributing mining rents towards economic development compared to other countries. Mining can play a transformative role in a country's development because of the influx of wealth, however, mining comes with environmental and social costs if not managed properly. A key challenge for Mongolia is finding ways to manage these impacts and create a solid foundation for social development which respects and supports the livelihoods, health and social wellbeing all of its people.

### The unique relationship with herder communities

Contemporary Mongolia is strongly influenced by its long and rich nomadic heritage. Around a third of the population identify as herders, which brings deep-rooted connections with land and water through their livelihood and spiritual beliefs. With many large-scale mines operating in Mongolia, and many more local people involved in artisanal and small-scale mining, it is critical to understand the impacts of mining on herder communities. As women and men are impacted by mining differently (due to their unique roles, rights and responsibilities), particular attention needs to be given to the opportunities and challenges of women and men separately in responsible mining development.

To date, very little research has been done to understand the lifestyle and livelihood changes of herders and women in Mongolia. This handbook presents the findings of research commissioned to bridge this gap. The research was conducted by the University of Queensland's Sustainable Minerals Institute and the Gender Center for Sustainable Development, funded by the Australian Aid program. Over a period of eight years, the research team worked to develop a deeper understanding of how herding and mining interact, what external factors influence this interaction, how mining influences or alters gender roles and responsibilities, and what changes we might see from this interaction in the future.

### A holistic approach to understanding mining's impacts

The research team's intention was to go beyond what can be understood by environmental and social impact assessments alone by taking a connected view of how environmental changes are directly linked to social outcomes, lifestyle and livelihoods in the unique context of Mongolia. Integrating social science, geographic information systems (GIS) methods and water science allowed the research team to map both mining and herders' use of natural resources, while exploring the social impacts and interactions between mining and communities. The research team partnered with local organisations to gain unprecedented access to herder families and understand their perspectives in two distinct case study areas representing the dominant ecological regions in Mongolia: the Gobi Desert (Tsogttsetssi Soum) and the Northern Hangai region (Sharyn Gol Soum).

Combining these qualitative and quantitative methods over an eight year period, this handbook explores eight mining-induced issues that pose a threat to traditional herding livelihoods and the status of women in Mongolia. These include gender, governance, local community development, water resources, pasture availability, dust occurrences, resettlement and displacement, and artisanal and small-scale mining. These issues are discussed in the context of the Life of Mine concept embraced by the International Council on Mining and Minerals (ICMM) that considers the full timeline of a mine's development and its impacts on communities.

The research uncovered an overall picture of increased workloads, particularly for women, various negative health and social impacts for communities affected by mining-induced dust, changes to water resources and pasture availability, and the impacts of resettlement and displacement. While some efforts are being made by mining companies and governments across Mongolia to counter these negative impacts (e.g. through training, employment and local development schemes) fundamental challenges remain due to the rapid pace of development, the unique relationship between Mongolian herders and their land, and specific tensions arising from the different types of mining (including artisanal and small-scale mining).

## Executive Summary

### How to use this handbook

The handbook presents a discussion around six themes as separate chapters (local community development, water resources, pasture availability, dust occurrences, resettlement and displacement, and artisanal and small-scale mining); with gender and governance issues cutting across all chapters. While these themes are discussed separately, the closely linked nature of the relationship between Mongolians, their land and cultural heritage means they should be considered holistically. Each chapter explores the distinct experiences of women in herder communities; and uncovers many disparities between the perceived and actual opportunities and impacts within this vulnerable group.

### Recommendations and next steps

The handbook concludes with a summary of the key issues and recommendations that focus on opportunities for positive change at the community level. These recommendations will need to be adapted for particular regional contexts, however, they are intended as a tool to help all levels of government, mining companies and developers plan the next steps, and improve current and future practice for involving herder communities and women in responsible minerals development.

While the recommendations are divided by theme and stakeholder for easy interpretation and use, the necessary partnerships and close interaction between governments and mining companies mean that all recommendations are relevant to and apply, at least partly, to all stakeholders. More analysis is needed to identify which agencies are responsible and have the authority to take recommendations forward. Furthermore, a committed and coordinated approach across agencies is essential if these outcomes are to be achieved, extending the benefits to communities throughout and beyond the future of mining in Mongolia.

### For more information

A website has been developed to accompany this handbook.  
<https://www.csr.m.uq.edu.au/mongolia>

The website is designed to keep up to date with the issues and recommendations presented in this handbook as we draw further lessons for responsible mining development in Mongolia.



Figure 1: Herds in the foreground of recent mining developments

# **S1** Background





# 1 Background

A strong mining industry brings the possibility of economic development that can help nations and regions build foundations for sustainable development. This is certainly the case in Mongolia, where the mining sector is the main contributor to national growth and will remain crucial to the country's growth in the future. By one estimate in 2013, about 11.4 percent of Mongolia's total land was under mining license (Minerals Resources Authority of Mongolia, cited in Jadambaa et al., 2015). In 2014, the mining sector's contribution to the Mongolian economy represented about 26 percent of national gross domestic product (GDP) (The World Bank Group in Mongolia, 2014). Compared to other countries, Mongolia has one of the highest potentials for contributing mining rents towards socio-economic development (World Economic Forum, 2012) (Figure 2).

Minerals can play a transformative role in the development trajectory of a country because of the sudden influx of wealth that can come from their extraction. However, extraction has an ecological cost if not properly managed. Societies that are highly dependent on natural resources (land, water and pasture) are particularly at risk.

Contemporary Mongolia is strongly influenced by its long and rich nomadic heritage. Nomadic pastoralism is an integral part of Mongolian identity and Mongolians have profound respect for traditional herder culture (Baabar, 2005). Around 30 percent of the population identify as nomadic pastoralists or herders and have deep-rooted connections to land and water through their livelihood and spiritual beliefs. In its recent past, Mongolia has witnessed several complex and often interrelated bio-physical changes. This includes increasing formation of desert areas, extreme natural winter droughts (locally known as *dzuds*) and environmental degradation, particularly in terms of reduced availability and quality of land and water. Although mining can impact on water and land, and generate forms of airborne pollutants (dust emissions), action can be taken to minimise these effects on the surrounding environment. The significant growth of mining in Mongolia does not have to create additional stresses on the environment and the people that use it.

Country segmentation clustered by potential for mining sector growth and potential for socio-economic development

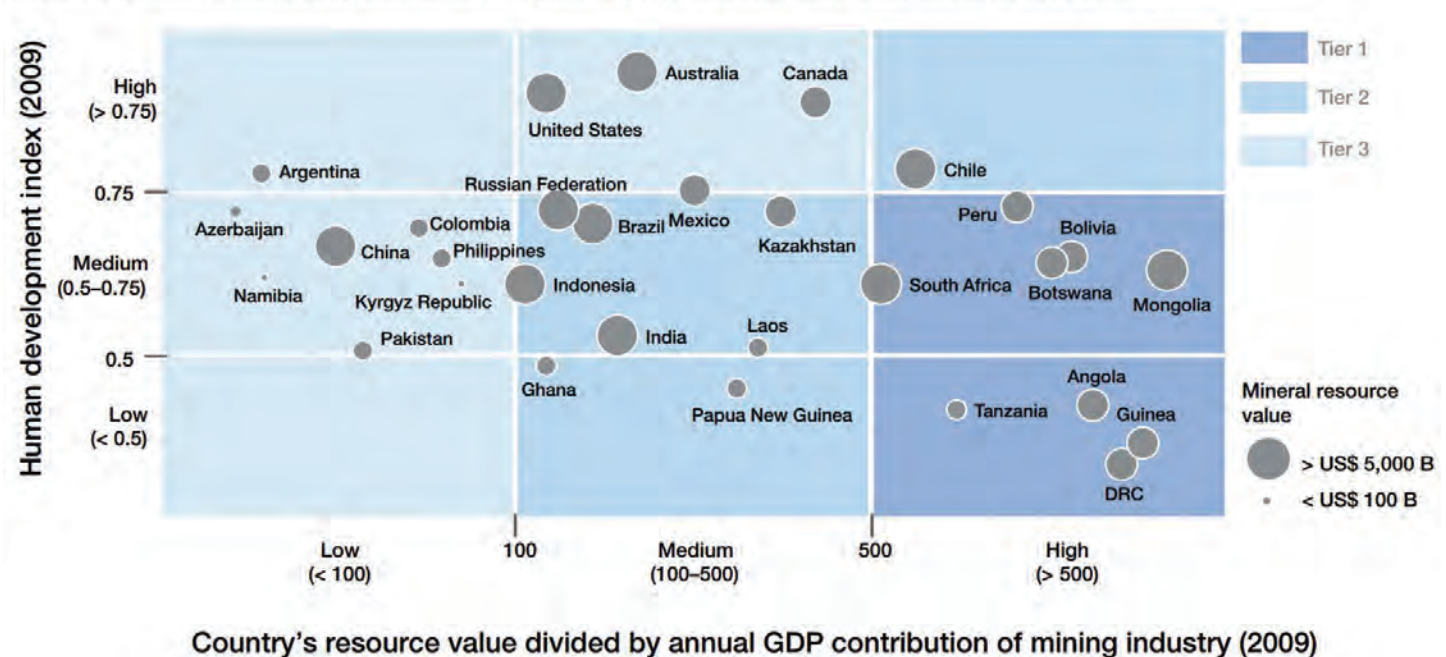


Figure 2: The potential for mining to contribute to socio-economic development: Tier 1 countries have the highest potential due to the resource potential and relatively minimal alternatives; Tier 2 countries have more diversification and mixed resource economies; Tier 3 countries have matured their development phase to the point where any contribution may be marginal or the resource potential is not as important for development (World Economic Forum, 2012).

## 1.1 Gender mainstreaming & social development in mining

The post-socialist transition period (from 1991 – 2000) created unprecedented poverty in Mongolia. Although Mongolia has experienced rapid economic growth from mining, poverty indicators in urban centres have only marginally decreased; and in rural areas have increased (UNDP, 2011 and McGrath et al. 2012). Growing inflation and cost of living associated with the fluctuating minerals economy has furthered the gap between the rich and the poor (The Asia Foundation, 2013). Intensified cash based economies, new technologies and shifting populations have introduced new social values that are changing urban and rural centres, and determining individual access to social benefits. There is a growing perception in rural communities that mining has benefited the elite more so than the broader population.

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*Ensuring that women are active participants in development and in community-decision making is good for women, good for families, and good for business (World Bank, 2009).*

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It is undisputed that social development that includes sensitivity to gender issues and women's economic empowerment delivers long-term health, education and local development outcomes (Keenan, Kemp, Ramsay, 2014). Indeed the equal distribution of the benefits from mining is critical to building a resilient and

diversified community in a resource based economy. As women and men have different social roles, rights and opportunities in any given cultural context, they are impacted differentially from mining operations. Therefore, a gendered perspective that takes into account the roles, responsibilities and perspectives of women and men is critical to truly understanding the opportunities and challenges for responsible mining development in Mongolia.

There has been growing attention by international donors, private organisations and governments to include women in all stages of mining development. Field research in rural Mongolia has amply demonstrated that the social and environmental changes caused by mining disproportionately impact upon women in Mongolia, particularly where traditional livelihood practices rely on the same surrounding natural resources (Cane, 2014; McGuire, G. 2003). This handbook applies a gendered lens to understanding the opportunities and challenges for women and men in mine-affected herder communities. A specific focus is applied to environmental change, opportunities for participation in large and small-scale mining, household and community divisions of labour, and changing cultural practices in the context of herding communities.

## 1.2 Handbook objectives

Although herders and women are immediately affected by mining, they are often the least consulted groups by governments and mining companies across Mongolia. To date, very little research has been done to understand the lifestyle and livelihood changes of herders and women in Mongolia. To fill this gap, the Australian Government's Australian Aid program funded the University of Queensland's Sustainable Minerals Institute to conduct research to inform the following questions:

1. How do herding and mining in Mongolia interact with one another?
2. How do herding and large-scale mining interact with one another?
3. What are the socio-economic, institutional and ecological factors that positively or negatively influence this interaction?
4. How do mining projects influence or alter current gender roles and responsibilities in traditionally herder communities?
5. What future socio-economic and ecological impacts may result from interaction between herding communities and mining?

A key challenge for Mongolia today is managing the ecological impacts and social benefits of mining to create a solid foundation for social development. The responsible management of Mongolia's mining sector is crucial to generate positive and long-lasting changes that sustain herder livelihoods, and protect and empower women and men. This handbook aims to provide insight into the experiences of herders, women and men interacting with mining; and offer guidance to policy makers on how to better engage and promote responsible mining. The aim is to provide a broad range of stakeholders with in-depth field knowledge about the impacts and potential benefits of mining on vulnerable populations in the dominant ecological regions of Mongolia: the Gobi Desert (Tsogttsetsii Soum) and the Northern Hangai region (Sharyn Gol Soum).

Through qualitative and quantitative research, the handbook explores eight mining-induced issues and themes that pose a threat to traditional herding livelihoods and the status of women. These include gender, governance, local community development, water resources, pasture availability, dust occurrences, resettlement and displacement, and artisanal and small-scale mining (ASM). Six of the eight themes are discussed separately with gender and governance issues featuring across all areas. However, all of these issues are interconnected and need to be managed together if they are to be overcome.

## 1.3 Methodology

### 1.3.1 A socio-ecological framework

In Mongolia and worldwide, the majority of mining-related impact assessments document the environmental and social impacts of mining separately using distinct and disconnected quantitative and qualitative methodologies. Consequently, in Mongolian herder communities where environmental changes are directly linked to social sustainability, the degree of these impacts on lifestyles and livelihoods is often misunderstood and ignored.

The handbook aims to bridge this gap by combining quantitative and qualitative approaches to provide a complete socio-ecological understanding of mining's impact on traditional herding livelihoods (see Figure 3). This integrative approach provides a framework for harmonising qualitative and quantitative data, and for understanding the complex relationships and association between environmental and social changes in herder communities.

The handbook integrates social science, geographic information systems (GIS) methods and water science to allow for interpretation of socio-ecological processes. Through this approach, the handbook maps both mining and herders' use of natural resources (via GIS technology) and the social impacts between mining and communities (via ethnographic methods).

The research uses two case study sites (Tsogttsetsii Soum and Sharyn Gol Soum) to demonstrate findings. These sites are representative of the dominant ecosystems where mining occurs in Mongolia, making the findings relevant to all current and proposed mining projects in the country. Both case studies incorporated qualitative and quantitative research methods across three separate field trips and in close association with local civil society partners. Over 125 household surveys were conducted to measure the key changes over an eight year period (2006 to 2013). This timeframe was chosen as it considers the time before significant changes in the mine-affected communities, including rapid growth and privatisation. Following the quantitative surveys, 45 in-depth interviews were conducted with key informants who were identified during the survey period.

The sample group was focused on herder households selected across different indicators including gender, age, socio-economic profile and ethnicity. A particular effort was made to interview both women and men. A breakdown of gender ratio in the household survey respondents is shown in Figure 4. The average annual income for surveyed herder households in Sharyn Gol was 3,070,000 tugrik (approx. AUD\$1980)<sup>1</sup>. In Tsogttsetsii, the average annual income was 2,880,000 tugrik

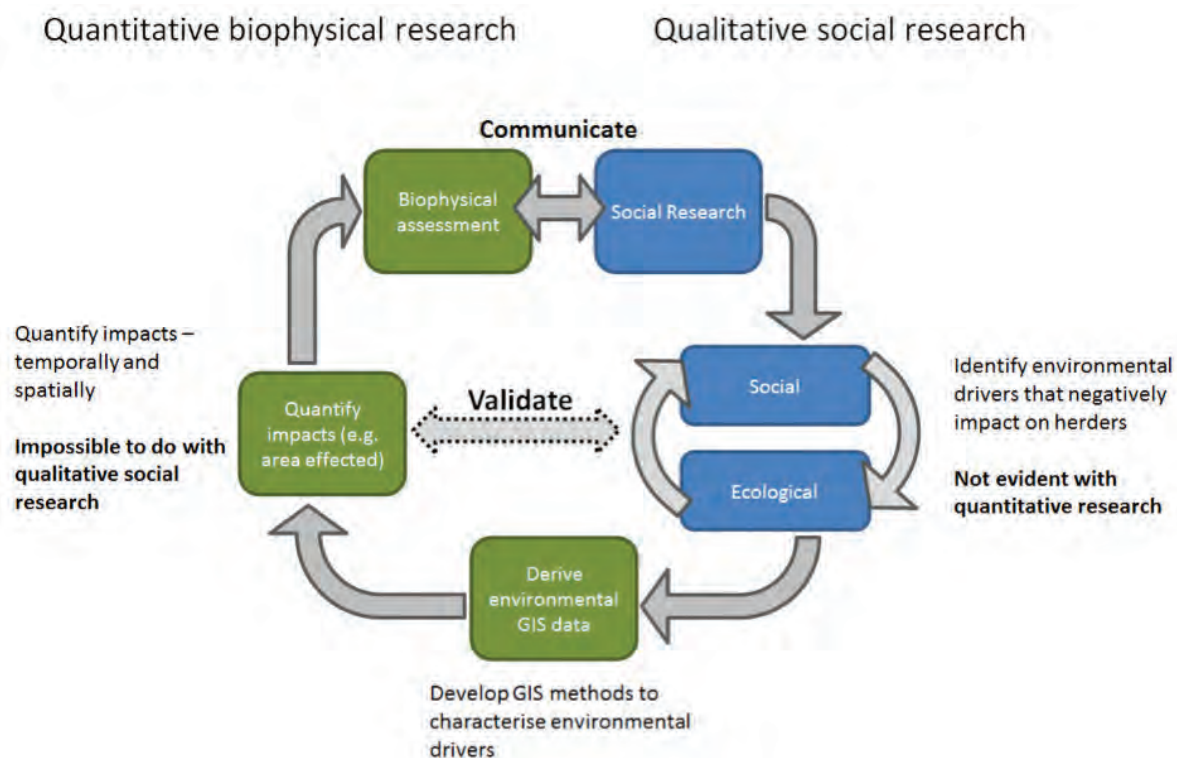


Figure 3: Harmonising quantitative and qualitative methods in a socio-ecological approach

<sup>1</sup> All exchange rates used are current as of April, 2015

(approx. AUD\$1860). Both household incomes are below the national minimum wage by approximately 6,121,000 per annum (approx. AUD\$4061)(Figure 5). However, herding is not traditionally a cash-based economy and other forms of capital are often bartered or used and consumed from within the herd (e.g. meat, milk and other animal products). Consequently, the sustainable livelihoods approach is a more appropriate measure of livelihoods as it draws upon the natural, physical and social networks used by herders in Mongolia (see 1.3.2 Sustainable Livelihoods Approach).

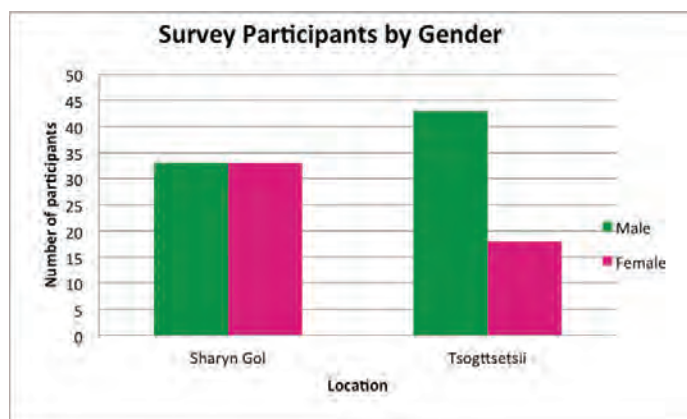


Figure 4: Number of household surveys by gender of key respondent

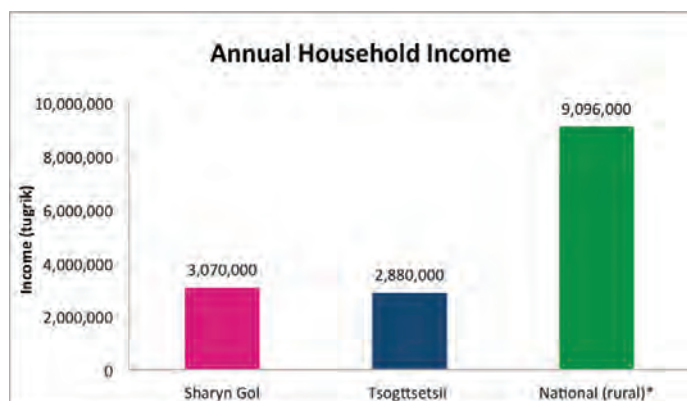


Figure 5: \*National annual household income was estimated as the 12 month total of the average monthly household income in rural areas defined by National Statistical Office in 2014. The average household income of herder households in Sharyn-Gol and Tsogttsetsii was estimated from the survey conducted in the summer of 2014

Scientific research using remote sensing data as well as water sampling was also conducted to test and strengthen respondent's observations of change. This approach offers a more holistic understanding of mining's impact on traditional herding livelihoods and provides improved information for government agencies, sub-national governments and mining companies to better understand and address the issues between mining and herding in Mongolia.

### 1.3.2 Sustainable Livelihoods Approach

The Sustainable Livelihoods Approach (SLA)<sup>2</sup> is increasingly being used by development practitioners to understand how people live and cope with vulnerabilities related to poverty, food insecurity and mining. This approach is particularly useful when examining herders and women as it moves beyond the traditional focus on economic assets, which have not always been the primary livelihood modes or strategies utilised by these groups. For example, the Sustainable Livelihoods Approach is more inclusive and reflects herders' deep connection and dependency on their surrounding environment and women's social networks and specific needs. It explores individuals' inequalities and inequities to access multiple forms of 'capital'<sup>3</sup> including:

- **Natural capital** – the natural resource stocks available to sustain livelihood objectives, such as land, water, soil, air quality.
- **Physical capital** – the basic infrastructure or production equipment available to support an individual's particular livelihood strategy.
- **Human capital** – an individual's skills, knowledge, labour and good health that allows livelihood objectives to be achieved.
- **Financial capital** – an individual's capital or financial resources (e.g. cash, savings, credit etc.) available to pursue a particular livelihood strategy or objective.
- **Social capital** – the social resources, networks, associations or relationships an individual draw on to support their livelihood strategy.

The handbook applies the Sustainable Livelihoods Approach to help consider all elements of herder livelihoods, and measure the often inseparable socio-ecological impacts of mining on affected communities over an eight year period. It has been applied to six of the eight themes of analysis for the two case studies. Again, these are the more tangible themes of local community development, water resources, pasture availability, dust occurrences, resettlement and displacement, and artisanal and small-scale mining; with gender and governance applied as overall themes to investigate the impact of mining on the two case study sites, frame the analysis and inform the recommendations.

<sup>2</sup>The concept of SLA has its origins in the landmark anthology: Conroy, C. and Litvinoff, M. (eds.) The Greening of Aid: Sustainable Livelihoods in Practice. London: Earthscan, 1988; and Chambers, R. and Conway, G. Sustainable rural livelihoods: practical concepts for the 21st century. IDS Discussion paper 296. Brighton, UK. 1992, which laid the foundation of SLA being used by the UK Department for International Development (DFID)

<sup>3</sup>The Five Capitals framework has various permutations. The Forum for the Future developed the framework in the 1990s but it has been applied in a slightly varied form with the replacement of financial with "cultural capital" in Bebbington A. "Capitals and Capabilities: A framework for Analyzing Peasant Viability, Rural Livelihoods and Poverty." (Bebbington, 1999).



## 1.4 Regional case analysis

The two case study sites, Sharyn Gol and Tsogttsetsii, are representative of the two broad ecological systems (desert and grasslands) where mining occurs in Mongolia. They were chosen to account for the variation in factors such as local landscapes, socio-political arrangements, hydrological specificities, extent of mining activities (scale of mining), and proximity or extreme remoteness to urban centres (see Figure 6). They were selected following consultation with local civil society and academia partners in Mongolia to ensure broader lessons can be drawn for

the country. The analysis provides a localised context of social, economic and ecological factors that determine how mining influences herding communities. The case studies also consider the different nature (legal and illegal) and scale of mining activities (large-scale mining, small-scale mining and artisanal mining) and how they affect herding communities differently and from a gendered perspective. For a fuller description of the different types of mining, see Appendix A: Types of mining.

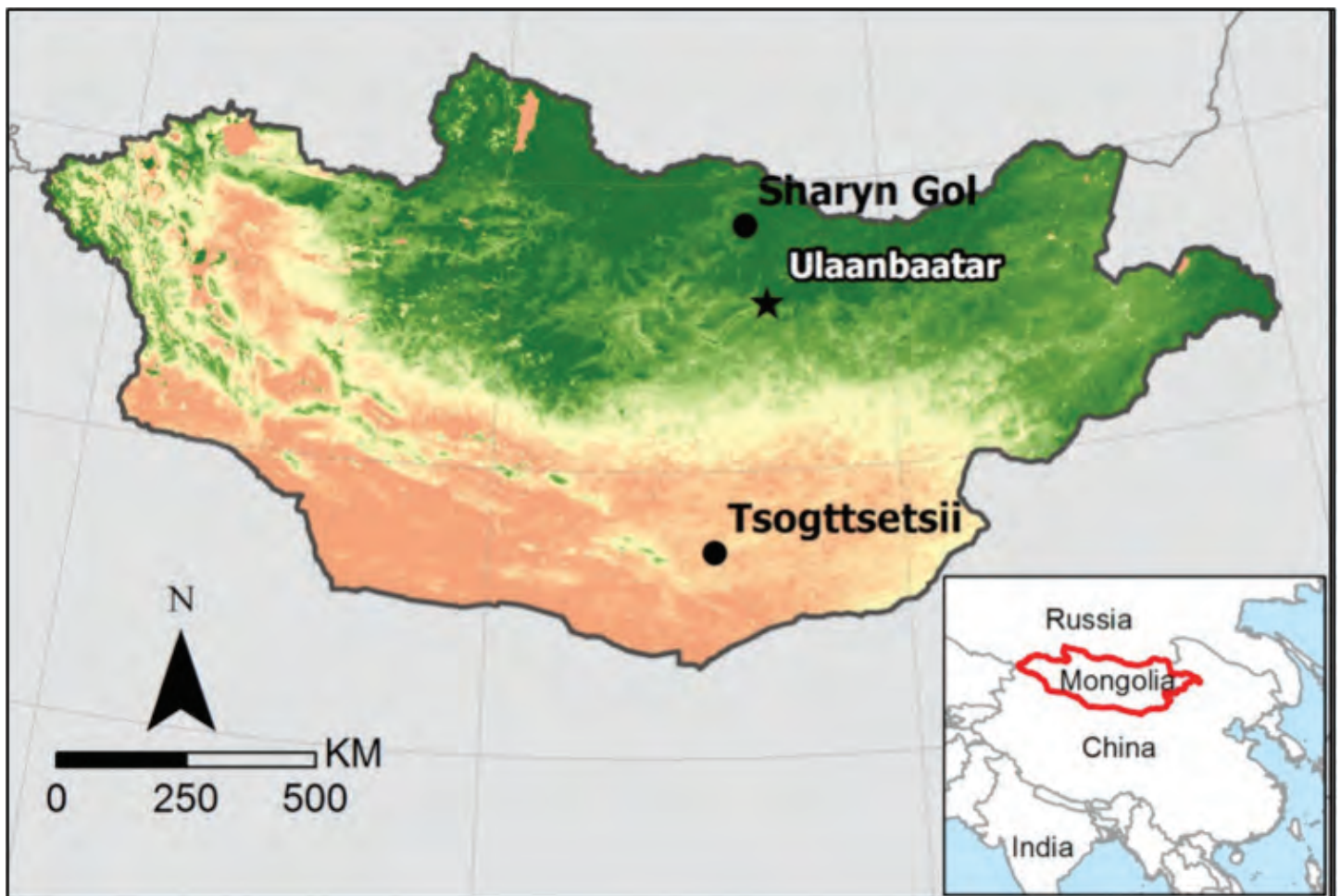


Figure 6: Mongolia and the two case studies under research



Figure 7: Sharyn Gol

#### 1.4.1 Sharyn Gol

The Sharyn Gol Soum<sup>4</sup> was chosen as a case study as it represents the definitive socialist era style coal mine and town (Figure 7). Located in the ecologically distinct grass steppe area of north Mongolia, Sharyn Gol is home to a large-scale coal mine and a number of legal and illegal artisanal and small-scale mines (Figure 8). The soum is located about 215 kilometres north of Ulaanbaatar and 45 kilometres south east from Darkhan.

The Sharyn Gol coalfield was first discovered in the 1930s, but was not developed until the 1960s under state-directed economic planning as a joint Mongolian and Soviet venture. The

large-scale Sharyn Gol mine is owned and operated by Sharyn Gol Joint Stock Company (JSC) and was privatised in 2003. The mine produces coal for domestic consumption with 80-90 percent of production delivered to the Erdenet and Darkhan power plants. A large proportion of the soum is covered by artisanal and small-scale mining operations. Many of the small-scale mining operations are foreign owned or joint ventures with Mongolian companies, while all artisanal miners are Mongolian nationals.

Similar to many socialist era mining communities, Sharyn Gol town lies directly adjacent to the large-scale mine and was

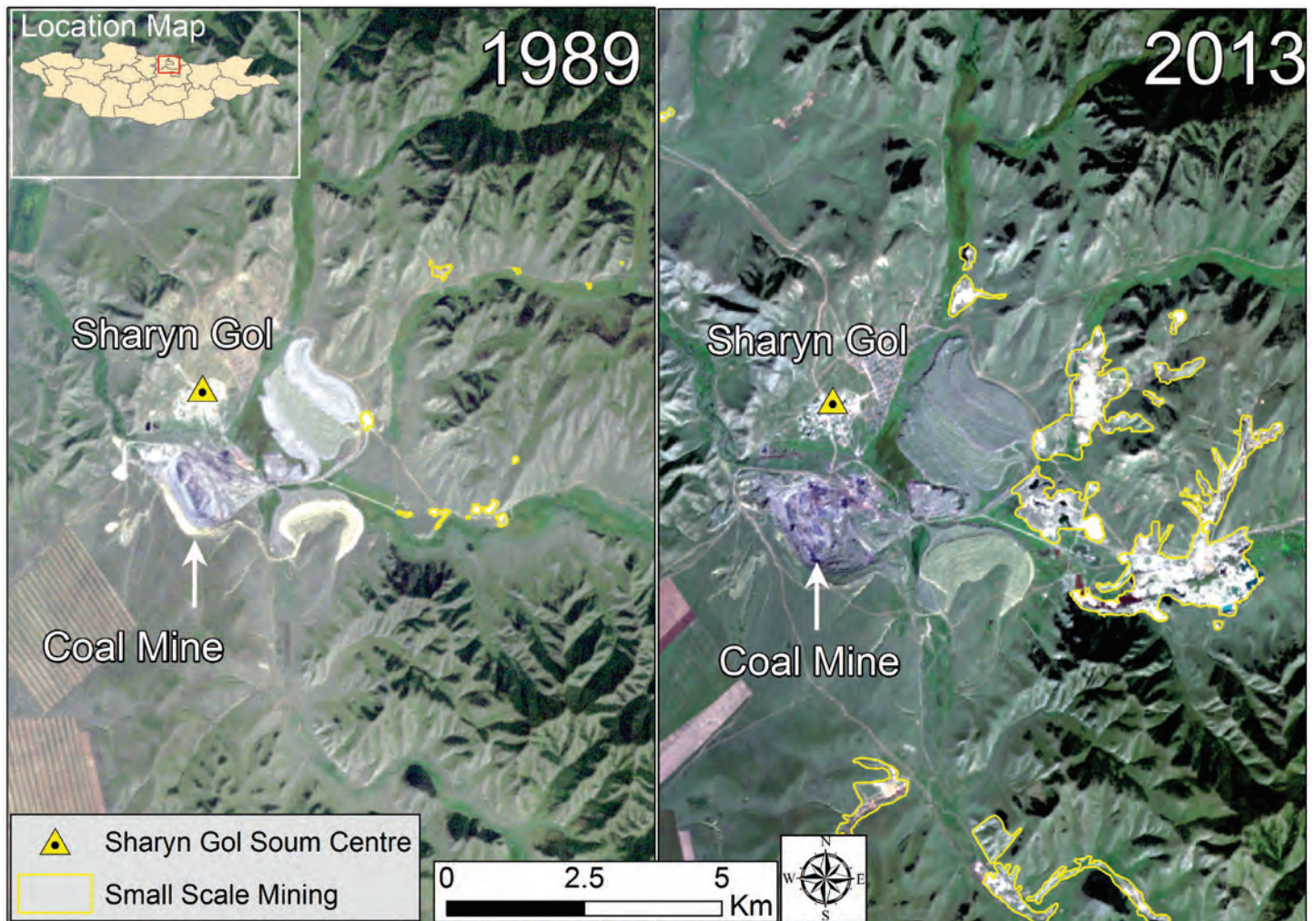


Figure 8: Aerial view of Sharyn Gol Soum Centre and small-scale mining sites

<sup>4</sup>Soum is a Mongolian term for district. Mongolia has 329 soums.



originally developed to service the mine. The town was developed by the government and included local amenities and services for mine employees, such as accommodation, shops, schools, a substantial hospital, bank, post office and recreational facilities. During this period, the government mobilised many Mongolians to the region to work in the mine or in other industrial processing industries, which supported the mine and townspeople. A large Russian population also resided in the town. During democratisation, all Russian residents returned to Russia and a large proportion of the Kazakh population also began to migrate towards Kazakhstan in search of economic opportunities. Sharyn Gol remains ethnically diverse, with about 1,500 Kazakhs and smaller populations of Zakhin, Durved and Bait ethnic groups in the area. The Russian mining influence in the soum remains strong, with a number of small-scale Russian mining companies

operating in the area. During the 1990s, most of the industrial sector closed and the mine remained the main source of income for many residents.

Today, Sharyn Gol is a town of approximately 8,000 people with the majority of the mine's 380 employees residing in the town and 138 herding families registered within the soum. However, given the relatively small size of the soum and its boundaries, many Sharyn Gol registered herders actually reside in surrounding soums (e.g. Huginson Soum). There is also a significant artisanal mining population of local and transient residents; however, numbers are difficult to obtain due to the often illegal nature of the sector.



Figure 9: Tsogttsetsii Soum Centre

#### 1.4.2 Tsogttsetsii Soum

Tsogttsetsii Soum is located in Umnugovi Aimag<sup>5</sup> in the ecologically fragile South Gobi Desert Region. Umnugovi Aimag is approximately 560 kilometres south from the country's capital city Ulaanbaatar (Figure 9). In recent years, the soum has been characterised by multiple large-scale coal mining projects, a high population influx, rapid growth and development. There are currently three multi-national, large-scale mines operating within close proximity to each other in the soum including Erdenes Tavan Tolgoi LLC (subsidiary of Erdenes MGL) at the Tsankhi Deposit, Energy Resources LLC at the Ukhaa Khudag Deposit and Tavan Tolgoi Joint-Stock Company (See Figure 10 for the proximity of the Tsogttsetsii Soum Centre to the Tavan Tolgoi mine site).

Tsogttsetsii has grown rapidly in recent years since the development of multiple large-scale coal projects and their supporting infrastructure projects (e.g. power stations and transport corridors). The official statistics show that the population has grown from 2,245 in 2008 to 6,108 in 2013 (Tsogttsetsii Governor's Office, 2014). Government informants

estimate that about another 12,000-15,000 transient people (including industry workers, truck drivers, unregistered residents and families) live and travel through the community (Cane et al., 2014). In comparison, the number of herder households in Tsogttsetsii has significantly dropped from 378 in 2008 to 232 in 2013 (Tsogttsetsii Governor's Office, 2014).

While Tsogttsetsii is now synonymous with large-scale mining projects, this has not always been the case. Prior to 1966, a small cooperative in Tsogttsetsii used to mine the Tavan Tolgoi Deposit and transport the coal by caravan to Umnugovi Province. During this time, the land was owned by the Tsogttsetsii Soum Government and miners were very spiritual and respected the land (Cane, 2014). In 1966, the national government gained ownership of the land and the first Tavan Tolgoi mine was first established. During this time, the mine supplied coal domestically to three provinces. In 2008, the state owned company Erdenes Tavan Tolgoi LLC was established and the mine expanded into a large-scale operation. This served as a catalyst for the region, with investment and mineral production peaking soon after.

<sup>5</sup> Aimag is a Mongolian term for province. Mongolia has 21 aimags

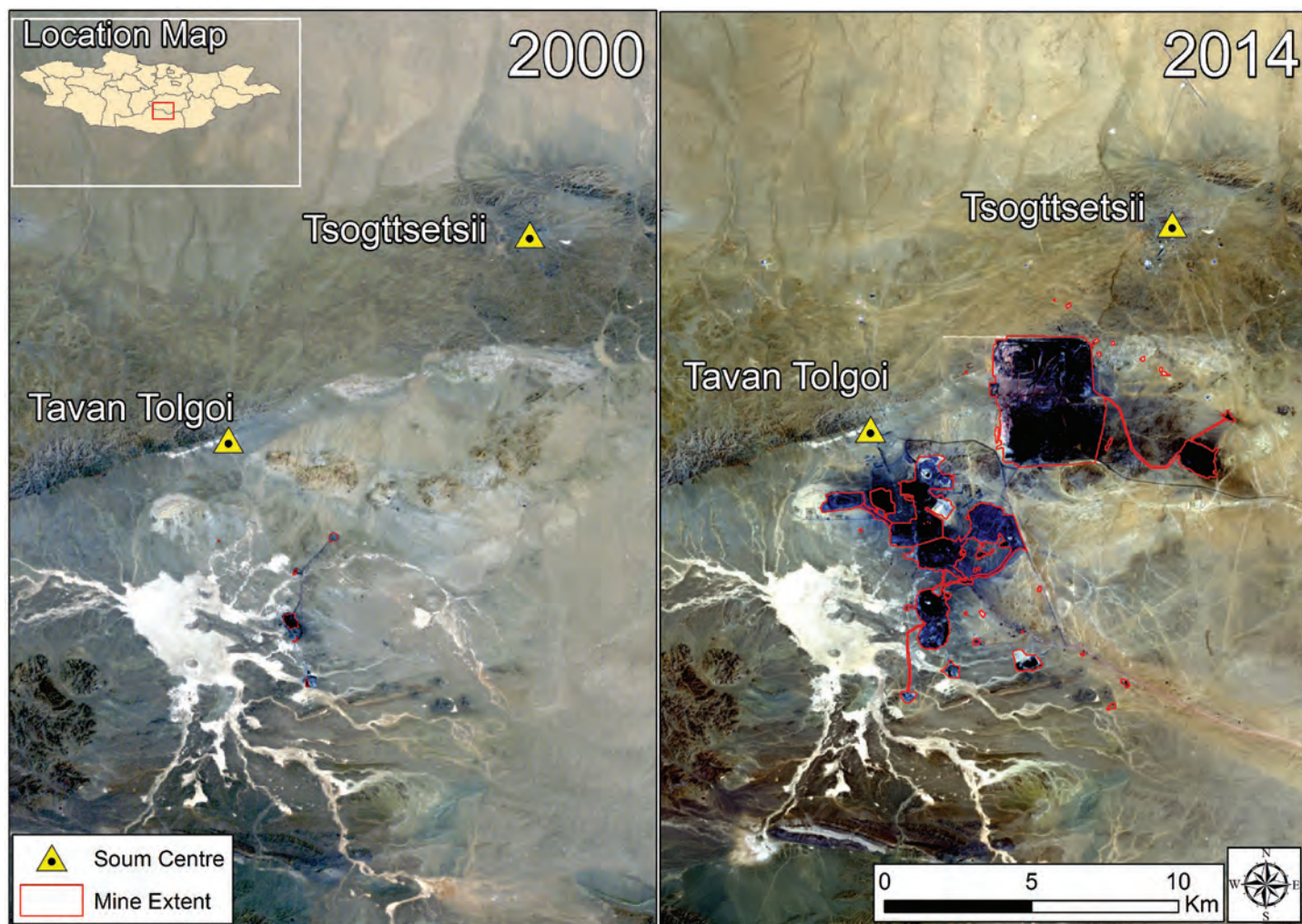


Figure 10: Aerial view of Tsogttsetsii Soum Centre and Tavan Tolgoi mine site



## 1.5 Life of mine concept

The research also employs an approach that considers the full timeline of a mine's development. Often termed the life of mine concept, this approach has also been embraced by the International Council on Mining and Metals (ICMM). Given that international business interests are relatively new to the Mongolian mining industry, it is important to recognise that mining activities form part of larger life of mine cycle. In large-scale mining, the processing of minerals consists of several phases, including exploration, feasibility and planning (site design), construction, operation, closure and post closure. Together they are referred to as the mine lifecycle or life of mine (Figure 11). Depending on the size, location and type of mineral deposits, the full mine lifecycle can last between 10 and 100 years. Each phase within the LOM involves distinct activities, which are summarised in Appendix B: Life of Mine).

The life of mine concepts are important as they recognise that all mineral deposits are finite resources with associated volatile markets; and mine closures are inevitable. A mine may close prior to complete resource depletion due to other economic, geological, environmental, political or social disruption factors. Understanding these concepts will help companies, governments and communities prepare for the closure of a mine and 'life

after the mine' through better planning and management of socio-ecological impacts within the life of mine cycle. It will also help to develop strategies that will extend benefits throughout communities and beyond the life of the mine. If mine closure is properly planned early within the mine life cycle, it can help deliver sustainable and lasting social and environmental legacies.

The life of mine concept will be used to frame the handbook's identified themes and issues. The concept will help anyone using this handbook (e.g. local government, national government and companies) identify what impacts to expect at each life of mine phase. The guidance is intended to better plan for and mitigate future socio-ecological impacts.

The research applies life of mine concepts to the case study analysis and recommendations in each of the chapters. While each theme is presented as a separate chapter it is important to recognise the interactions and feedbacks among different parts of the socio-ecological system represented by each of the themes. The close association of Mongolians with their land and cultural heritage makes it essential that the handbook is viewed as an integrated document. A synthesis on the application of life of mine is also provided at the end of the handbook (Appendix B: Life of Mine).

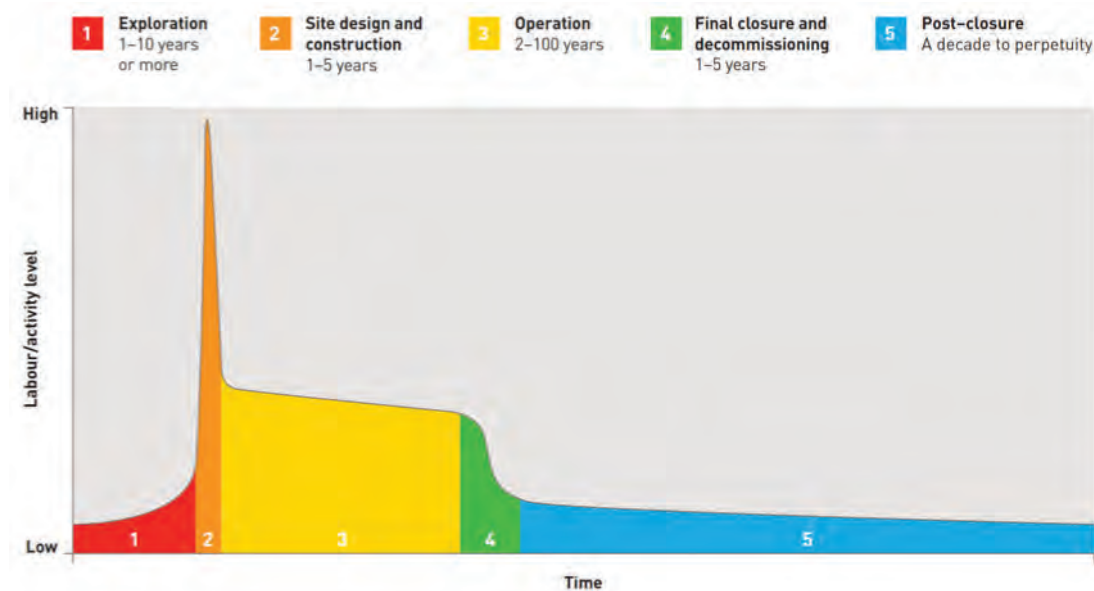


Figure 11: Life of Mine Cycle (ICMM, 2012)

## **S2** Local community development



## 2 Local community development and mining

Responsible minerals development can potentially bring various positive benefits to a community, particularly access to education, employment, communications, quality health services and new professional skills. For example, in the South Gobi many herder families have benefitted from improved telecommunications infrastructure and health care. Conversely, due to the rapid growth, sheer scale and often poorly managed infrastructure projects, the mining industry can intensify environmental degradation and exacerbate economic divisions.

*"In the area on the other side of the city, there are lots of poor people. They really live on the bottom and people aren't interested in meeting them and enquiring how to help them. Government and the mining company are not giving attention to them and their problems. We have a Russian saying 'we often talk about the beautiful flowers, but don't talk about the ground'. This is the situation here but everyone is important, even the people at the bottom."*

Retired man, Sharyn Gol Soum

A key aspect of responsible minerals development involves maximising communities' access to the benefits of mining to improve human and social development. However there are

strong perceptions in many Mongolian mining communities that these benefits are not equally distributed and that there are those who have benefited from mining and those who have not. The most vulnerable of these groups are women, single-headed households with children, herders affected by *dzuds* and elderly people without support networks.

Mining can contribute to social and community development through four main avenues (Franks et al., 2013), including:

1. employment, procurement and building human capabilities
2. multi-purpose developments, which benefit both the mine operation and surrounding communities (e.g. infrastructure developments)
3. direct community investments (e.g. community development initiatives)
4. macroeconomic contributions through taxes and royalties

This handbook will focus on opportunities delivered to groups at the community level (employment, procurement, infrastructure, education and community development programs) rather than at the regional and national level.



Figure 12: Small market place in Sharyn Gol Soum Centre

<sup>6</sup> *Dzuds* are extreme multiple natural disasters involving summer droughts, which result in limited pasture and production of hay, followed by extreme winter temperatures, snow and winds.



## 2.1 Key regulatory aspects

In Mongolia, laws relevant to the distribution of local benefits to communities are the Minerals Law (2006) and the Law of Mongolia on Amending the Minerals Law (2014) ("the Amendment"). All minerals license holders and subcontractors in Mongolia are required to comply with these relevant national laws and requirements. The Minerals Law and the Amendment include:

- quotas for employing Mongolian nationals at mining license holders (Minerals Law)
- quotas for employing Mongolian nationals at subcontractors engaged by a mining lease holder (the Amendment)
- mandatory obligations for resource companies to establish local-level collaboration agreements with local authorities.

Despite these requirements, centralised state power over mining sector regulations and performance fails to fully recognise the importance of local stakeholders (including local government and local people). While Mongolia has transitioned into a democratic state, a central planning and local compliance mentality still lingers. In 2012, the Integrated Budget Law introduced the Local Development Fund (LDF), which is a useful avenue for local governments to exercise more control over local development. The funds allow local people to participate in defining community development priorities; and it has a detailed procedure for selecting and prioritising community projects. However, final decisions on LDF-funded community projects are made by the Citizens Representatives Khural (CRK) of soums. Research and audit reports indicate that there is a strong legacy of centralised decision making and slowly changing attitudes and behaviours from policy makers towards full transparency and broad-based informed consultation.

The social aspects of mining are also not adequately represented in the environmental impact assessment (EIA) and the approvals process in Mongolia (Cane, 2014). The law focuses on the environmental and scientific areas, and underemphasises the importance of public consultation and of properly assessing

and mitigating local social impacts. One way to improve community development outcomes at the local level is through the provision of negotiated local agreements, which can help ensure opportunities (such as employment, skills training and infrastructure) are targeted towards local people, rather than new arrivals (see Box 1: Community Agreements in Mongolia).

Companies seeking credit loans from international donors must also comply with the donor's international compliance standards. These standards and policies often vary across international financial institutions, but usually include measures to minimise social and environmental impacts; and safeguards for protecting local people and surrounding environments. In Mongolia, a number of mining projects have sought or are seeking financial support from international donors, including Energy Resources' Ukhua Khudag Mine (The European Bank for Reconstruction and Development or EBRD), Sharyn Gol JSC's Sharyn Gol Mine (EBRD) and Rio Tinto's Oyu Tolgoi Mine, (International Finance Corporation).

### Box 1: Community Agreements in Mongolia

Community agreements between resource companies and host communities have been used in some resource-rich countries, such as Australia and Canada, as an effective local governance mechanism to manage the impacts and benefits of mining. Community agreements are usually legally binding and negotiated terms that outline strategies of mechanisms for: (1) managing the local environmental and social impacts of mining; and (2) maximising opportunities for local development.

Mongolia is one of few countries in the world that has made agreements with local host communities mandatory. Article 42.1 of the Minerals Law states:

*A license holder shall work in cooperation with the local administrative bodies and conclude agreements on issues of environmental protection, mine exploitation, infrastructure development in relation to the mine-site development and job creation.*

However, according to a Centre for Human Rights and Development assessment, in practice local-level cooperation agreements between companies and local authorities (and pertaining to financial and material benefits) tend to be made on an ad hoc basis and are not publically disclosed by agreement parties (companies and soum governors). Further, local-level agreements are usually developed at the discretion of companies and local government authorities, which can lead to potential individual abuses of power.





Figure 13: Affected herders that now reside in Tavan Tolgoi Town Centre

## 2.2 Gender, local community development and herder livelihoods

Ensuring that opportunities from mining include both women and men in the household is essential to responsible minerals development. When gender equality and empowerment are central to social benefits accessed from mining, community development is more inclusive and less likely to result in negative social costs.

*"Locals mostly work in low positions at the mine, mostly cleaners and drivers. Herders don't apply to the mine – herders do herding"*  
Elderly herder, Tsogttsetsii Soum

In theory, local benefits from mining can provide an alternative livelihood source for herders. For example, supplying produce or employment and services to a mine or mine-supporting industries offers an opportunity for increased income (financial

capital). In practice, however, many herders are unable to access these benefits as they lack the necessary skills and resources to do so. In instances where herders have accessed mining-generated benefits and transitioned to wage-based employment, some households have experienced greater access to improved education and health opportunities.

Meanwhile others have experienced weakened cultural values and loss of traditional livelihoods. Emerging evidence suggests that in mine-affected areas, herders are leaving or being displaced from their livelihoods, often to the detriment of women and the households. Indeed, it is more common for men to become employed in the mining industry and for women to be excluded. Women often experience a double-burden of work by remaining with the herd, or by becoming homemakers and losing their traditional livelihoods and knowledge.

### 2.2.1 Natural capital

Socio-economic community benefits from mining have a minimal impact on the direct natural capital of herders. However, as mining has altered the natural capital of pasture and water in many regions in Mongolia, it has placed significant stress on livelihoods. Some company-community investment programs have sought to minimise these negative impacts in a way that compensates herder livelihoods. For example, mining companies have initiated pasture management and tree nursery and planting development programs in Umnugovi as part of their land rehabilitation and restoration efforts. Some company environmental officers and community development staff also engage local herders and work together to protect vulnerable wild animals.

In Tsogttsetsii, The UHG Company has previously paid herders to manage and monitor sections of the haulage corridor, known as the 'coal road'. Herders were paid a monthly stipend to track numbers of wild animals, keep the areas clean and report any road incidents. Our research shows that herders held mixed views on these programs. On the one hand the stipends are perceived as a form of compensation that was insufficient to account for the level of ecological destruction of their surrounding pasture land. Yet, on the other hand, due to the lack of financial capital and opportunities in the area further programs were encouraged. Indeed in Sharyn Gol, where participatory monitoring programs are not currently available, herders requested to be involved in rehabilitation programs due to their knowledge of the area's ecology and climate.

## 2.2.2 Physical capital

The physical capital of herders and local town residents has been both positively and negatively impacted by mining. Company and government investment programs have provided multi-purpose, basic infrastructure to local town residents and herder households, including power supplies, schools and health services (Centre for Policy Research and Social Sustainability Services, 2014) (Figure 14). Companies have also assisted in building apartments, dentists and cultural centres, which have improved livelihoods of citizens. At the household level, companies have assisted herders to build individual water wells and obtain bank loans, which have been used to acquire physical capital such as tractors and greenhouses.

The flip-side of these positive developments is that during mining 'boom' periods, mine-affected regions face basic infrastructure shortages and increasing demand for (and pressure on) public services and housing, which has a negative impact on an individual's access to physical capital (Thomas et al., 2006) (see Box 2: Boom and Bust Cycle).

### Box 2: Boom and Bust Cycle

Within a mine's life cycle there are periods of 'booms' and 'busts', which are driven by volatile commodity prices and other socio-political factors. 'Booms' are fuelled by high mineral demand, which drive high commodity prices and incentivise higher production. 'Booms' are inevitably followed by 'busts', which are characterised by supply surpluses, falling commodity prices, reductions in company capital costs and spending, investment postponements and mine closures.

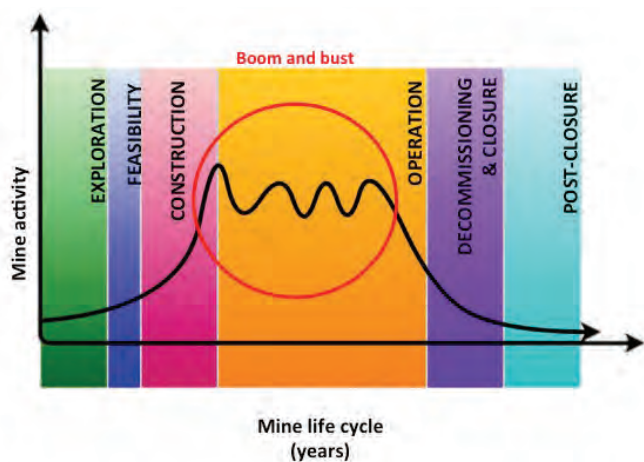


Figure 14: Mine constructed power lines in South Gobi

Rapid mining growth and population influx has placed strain on existing public infrastructure and services, such as kindergartens, hospitals and schools. For example, at the peak of the boom in Tsogttsetsii the population was approximately 20,000 people; however, the local hospital still contained five beds that were designed to cater for 2000 people. Likewise, when herders or new arrivals migrate to mining town centres, often the kindergartens are under-resourced so women are unable to work and must remain at home to look after children. Finally, often locals cannot afford to access the new infrastructure and remain outside the direct benefit stream.

While companies have contributed to infrastructure development, during times of 'boom' it is often difficult to meet the demand for these services. Further, if mining companies are the sole provider of infrastructure, issues often arise during 'bust' periods and mine closure, as companies' scale back spending and infrastructure and services are often unable to be maintained by local government budgets. To avoid these issues, it is important that the 'boom' and 'bust' cycle is considered when planning, funding and developing community infrastructure and services.



Figure 15: Herders selling vegetables outside of newly built apartment blocks sponsored by the company.

### 2.2.3 Human capital

The ambiguity of government legislation, sporadic compliance and the lack of regulatory provisions mean that the opportunities from mining are often unequally distributed and local people in mine-impacted areas fail to reap the full benefits from mining. For example, while the Minerals Law and the Amendment outline minimum employment quotas for Mongolians, it makes no distinction at the sub-national level (i.e. there is no difference between 'original locals' and 'new arrivals') (see Box 3: Defining who is 'local?'). Many people from distant or neighbouring areas can come and register as local citizens and gain employment. During the research, local people repeatedly reported that mining had brought some positive, but often unequally distributed contributions. They expressed concerns that nepotism and discriminatory hiring policies minimised the chance of local people gaining new skills and employment in the mines.

*"The mining company hires their relatives and friends...they first hire people they know and then through advertisement... These relatives are from different areas"*

Miner, Tsogttsetsii soum



Figure 16: Mine employees celebrating at Tsogttsetsii Soum 90th Naadam

#### Box 3: Defining who is 'local'?

##### National government

Under the Minerals Law (2006 and 2014 Amendment) the National Government outlines requirements for employing Mongolian nationals. However, no distinction or preference is provided at the sub-national level.

##### Mining companies

Companies often consider all people within an aimag as local. For example, in Tsogttsetsii, companies often consider all people from within Umnugovi Aimag as locals, including people from Dalanzadgad and other neighbouring soums.

##### Communities

Communities often only consider local people as people within the soum or someone whose family has lived and owned land for generations or hundreds of years. Many local people consider all other migrants as outsiders.

The term 'local' is often a highly varied expression, particularly when trying to define who the recipients of mining-generated 'local' benefits are. Some definitions refer to local at the national level (e.g. all Mongolians and not expatriates), and others at the aimag or soum levels. In the context of mining, the term is often highly contested among different stakeholders and also within stakeholder groups. In the past, conflicting definitions have been the source of tensions as many 'original locals' in mining towns feel they carry the brunt of the negative impacts while 'new arrivals' reap the economic benefits from mining. It is important that mining companies engage with communities and local government on how to define 'local' as early as possible.

Many company policies advocate for hiring local people and/or working with local businesses. However, it is often the case that local communities do not have the required skills to work in the industry or associated services. To date, mining companies have provided support to local citizens through direct community investment programs or resettlement packages. This support has included scholarships for herder children, skills training and help to find waged-employment. For local businesses and individuals wanting to sell goods or services to mining companies (i.e. local procurement), vocational, skills-based training is offered (e.g. for meat production, growing vegetables, sewing garments etc.). To better target such programs, global best practice is for mining companies to engaging with communities and local governments via a social mapping exercise to identify opportunities for local people and businesses to be involved (see Box 4: International example of local business mapping).

#### Box 4: International example of local business mapping - Anglo Ferrous, Brazil

To gain approval, Anglo Ferrous Brazil undertook a socio-economic assessment and business development plan for Minas Gerais. After undertaking social and mapping of industrial, commercial and service businesses, in the affected communities and assessed their capabilities in terms of their:

- Management
- Human resources
- Product, process and environment
- Clients and market
- Supplier relations
- Finance and costs

The collected data was used to form the basis of a collaborative company-local community developed Business Action Plan, which promotes local economic development through local businesses supplying products and services to the mine (Esteves et al., 2010).



Despite this, herders and local people raised concerns about these 'unequal' opportunities, which they felt were biased towards 'new arrivals' rather than 'original locals'. The research established that in the South Gobi, often those employed directly by the mine are predominately employed in basic service roles such as drivers and cleaners. While this is a trend experienced across the globe, many herders expressed that companies do not engage enough to upskill local people and businesses, particularly herders, to meet company standards. This was more acutely experienced by women in the mining industry who are predominately employed in service or administration support roles, with very few engaged in higher-level management or decision-making positions.

Experiences of women employed in mining ranged from positive to difficult. Gender based discrimination continues to impact on women's access to employment opportunities, and leadership and decision making roles. It has also made them more susceptible to sexual harassment in the workplace, as supporting data suggests (Cane, 2014). Interviews with female and male miners suggested that women need to have support from other male relatives in the operation to maintain in a secure and safe working environment. Currently, there is no regulatory mechanism in place to prevent, address and report workplace sexual harassment in either private enterprises or public institutes.

The research found that companies are often less likely to employ men over the age of 40 and women over the age of 35. While company policies do not formally have age restrictions, a company key informant noted that 60-70 percent of the women employed in the mining company were below the age of 35. These statistics demonstrate that there is an underlying bias towards employing younger people and men in the mining industry. Evidence also suggests that ethnicity or a person's socio-economic background may be a factor inhibiting particular groups from accessing opportunities more broadly and within the mining sector. While ethnicity was not a key focus area of the research, nascent observations from Sharyn Gol suggested that Kazakh and other minorities found it harder to access employment and conditions are often more difficult and unforgiving. Whether this is attributed to the high-levels of nepotism or ethnicity cannot be determined. Further research is needed to determine whether ethnicity or access to social networks is limiting employment opportunities for ethnic minorities.

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*"There are trainings for women. I don't know how effective those trainings are. Even if they finish the training, there is no secure workplace. You have to be assertive or go under the wings of the male relatives."*

Male herder and mine worker, Tsogttsetsii Soum

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Challenges inhibiting local people and vulnerable groups from accessing mining-generated opportunities may be overcome by implementing sound, targeted and inclusive local-level agreements. If properly managed, agreements have the potential to incorporate the interests and rights of local women, men



Figure 17: Ex-herder who now works at a water well, constructed by a transport company

and herders into the development process. However, as local-level agreements are negotiated between companies and local governments, it is essential that future agreement-making negotiations are inclusive of local people and vulnerable groups (women, elderly and ethnic minorities) and not biased toward people in the positions of power. While the Law on Conflicts of Interest was enacted in 2012 to minimise personal-based interest in decision making, local stakeholders still expressed concerns about corruption.

## 2.2.4 Financial capital

Local benefits (including employment and local procurement) have a direct impact on herders' financial capital base (household income). In Sharyn Gol and particularly in Tsogttsetsii, herders reported receiving direct support from mining companies (Figure 19). The majority of this support was noted as 'other', which includes companies providing goods such as animal fodder or coal. Five per cent of respondents in Sharyn Gol and nearly 10 percent of respondents from Tsogttsetsii were directly employed by the mine, which had a positive impact on their financial resources (Figure 20).

Beyond direct employment, mining also generates potential opportunities for local businesses. Mining requires goods and services to support its operations. It also generates a population influx, which creates greater demand for local goods and services, and increased incomes for some local business. The research demonstrated that some local town residents and herders supply mining companies (particularly small-scale companies or employees of large-scale companies) with goods and services.

Examples included:

- supplying meat and dairy products to small-scale mining companies and/or mine employees
- fixing mine company employee uniforms
- selling clothes to mine employees and truck drivers
- making seat covers for truck drivers.

*"Small-scale mines are beneficial...I used to supply dairy products and meat with mining companies and I used to buy fuel from them. We didn't have a contract with them. It was an unofficial trade. I used to supply milk with low price (half price). I used to make an oral contract with companies, but I would keep a record how many litres we provided. I also used to supply meat (e.g. one cow per month and mutton all at half price). I used to take cash, but now I don't provide dairy products as they stopped taking dairy products... that small-scale mining company as their lease finished and they moved on."*

Sharyn Gol Soum herder



Figure 18: Local sewing women in Tsogttsetsii Town Centre

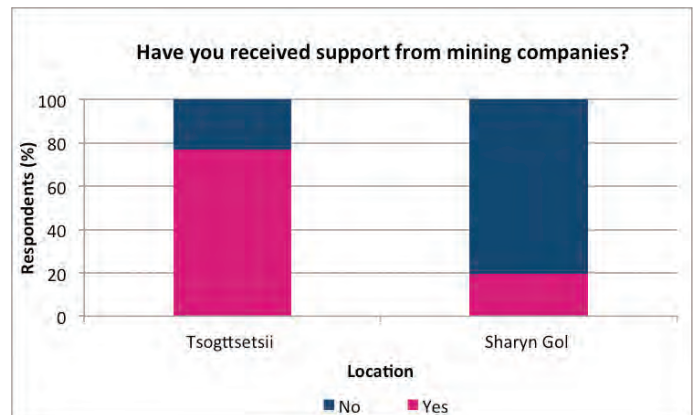


Figure 19: Number of respondents who have received direct support from mining companies in Tsogttsetsii and Sharyn Gol

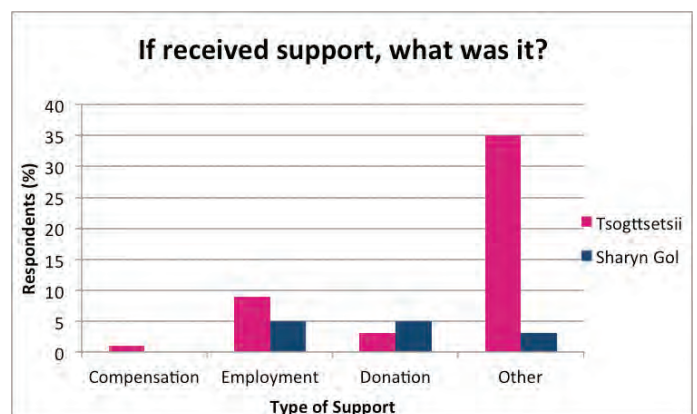


Figure 20: Types of support received from mining companies in Tsogttsetsii and Sharyn Gol

People also reported that some companies employ multiple herder households to look after their company farm, which supplies meat, dairy and vegetables for the company. While this arrangement provides some benefits to local communities, improved arrangements would spread local benefits more widely.

Few herders or local town residents have formal contracts with large-scale companies, but have more regular arrangements with small-scale companies and mine employees. The lack of formal arrangements means that the local communities are in a vulnerable position as there is no guarantee of a continued and steady income.

Overall, there is a general sense that mining brings people with good salaries to an area, which has some positive financial flow effects for local people. However, town residents and herders expressed that more could be done to identify potential mining company business opportunities, and to formalise contracts between herders and companies to ensure a more consistent and steady financial capital base.

### 2.2.5 Social capital

*“Overall, the soum centre has changed from a herding town to a mining town. In recent years, a lot of herders have sold their livestock and come to live in the soum centre.”*

Deputy Governor, Tsogttsetsii Soum

During the research, a range of negative and some positive impacts on social capital were reported. In the older, more established socialist era mining towns like Sharyn Gol, 61 percent of respondents noticed changes primarily associated to artisanal and small-scale mining and privatisation of the large scale mine. In Tsogttsetsii, where mining growth has been significant and rapid over the past eight years, 93 percent of respondents noticed changes associated with shifts in cultural values due to an influx of mine employees, people looking for opportunities and mine contractors (see Figure 21).

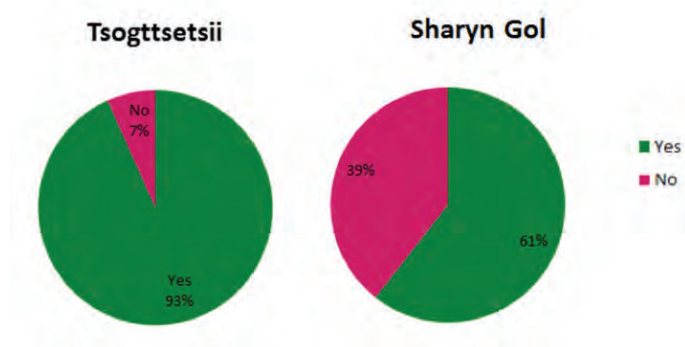


Figure 21: Percentage of survey respondents who observed community composition changes in the study period

Nomadic culture is closely associated with the economic tasks of herding, hunting and self-sufficient agricultural production, which produce both food and wealth for the basic family unit. Generally, Mongolian people identify with this heritage, regardless of their urban or rural settings. Herders in the case studies reported that since mining began, more herders, particularly the younger generation, prefer to live in urban areas and seek wage-based jobs. People surveyed overwhelmingly suggested that an ideal livelihood strategy would involve one family member working for the mines to gain an income, while the remainder of the household continued to herd their animals. When herders move into mining and wage-based employment, traditional herder knowledge and skills are weakened.

Other people surveyed, particularly the younger generation, expressed that mining and the associated population influx has led to positive development and social changes. For example, local teenagers in Tsogttsetsii reported that since mining, they have had more interactions with children from bigger cities, which has helped them build their communication skills and be more open and social. School children have also increasingly become connected on social media platforms, such as Facebook.

Despite these positive improvements in social interconnectedness, several households expressed concern that mining-induced growth has changed their community's social dynamics and made their towns less safe. Specifically, people surveyed reported that mining-induced growth and population influx had brought increased traffic, traffic accidents and unruly behaviour like drinking and fighting in the streets. A new social phenomenon of children headed-households has emerged in artisanal, small and large-scale mine affected areas. In these situations, both parents are working long hours on similar rosters and young children are managing the household affairs. Reports of violence and abuse in these situations have been identified. Likewise, when men undertake rostered work arrangements, many families live apart, which can be stressful and place strain on family relations. A number of people expressed their concern that this is difficult for young couples and often leads to higher divorce rates and domestic violence in the household.

*“Men get drunk and then fight. In some cases drunk people follow women and children in the streets or chase them in cars...This doesn't occur as much now as Energy Resource (and maybe in partnership with the government) installed street lighting in some parts of the soum centre during the 2014 winter.”*

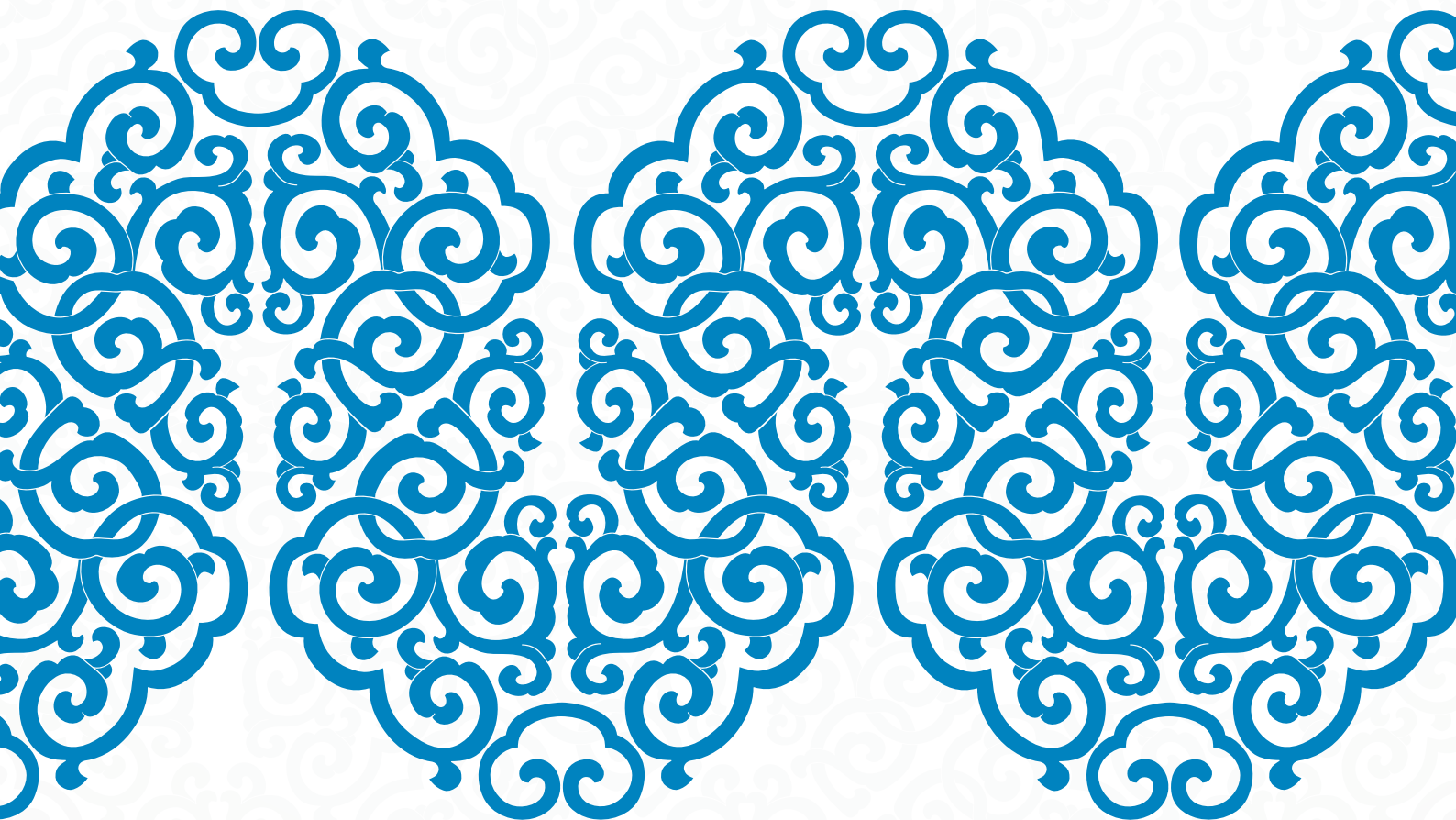
Adolescent Tsogttsetsii Soum Centre resident

Some mining companies are attempting to counter these negative impacts by encouraging local people and herders to work together and build social relations that aim to improve community dynamics, boost productivity and improve livelihood objectives. For example, some companies have funded community safety facilities and services, including street lighting and women health clinics.

The research shows that local community development remains a fundamental challenge for mining in Mongolia because of an entrenched centralised system which needs to adapt to the rapid pace of rural development.



# **s3** Water resources



### 3 Water resources

Mongolia is characterised as a country with limited water resources, with a climate ranging from semi-arid to arid. Average annual precipitation varies from less than 50 millimetres in the southern Gobi region to 400 millimetres in the wetter north (Davaa et al., 2007). Groundwater is a critical national resource, providing approximately 80 percent of Mongolia's freshwater withdrawals (UN Water, 2013).

Numerous factors have led to increased strain on Mongolian water resources, including climate change, deforestation, irrigated agriculture, socio-economic factors (degrading and abandoned water infrastructure), land degradation, competing land uses and a rapidly growing mining industry. As an example of increasing water stress, the number of dried up streams, lakes and springs in Mongolia increased by 30 percent from 2003 to 2007 (Dagvadorj et al., 2009).



Figure 22: An example of a traditional groundwater well in the South Gobi

#### Box 5: Sharyn Gol mine and Tavan Tolgoi mine – contrasting case studies

##### *Contrasting water environments:*

Sharyn Gol is in the wetter north of Mongolia, where the river flows all year and is the traditional source of water. Tavan Tolgoi is in the South Gobi desert (near Tsogttsetsii), where there are no rivers and herders rely on shallow groundwater wells.

##### *Contrasting mine water management:*

At the Sharyn Gol coal mine there is a small excess of water resulting from drainage of rainfall into the pit; this is pumped from the pit into the river. There are also artisanal and small-scale mines that dam and use the river water upstream. The Tavan Tolgoi coal mine also has a small amount of water draining into the pit, which is mostly collected and used by the mine. The Tavan Tolgoi project needs water for coal washing which is supplied from borefields constructed in deep aquifers in the surrounding region. Due to the general shortage of water in the area, the mine company has made provision for supply from their borefield scheme to the nearby town of Tsogttsetsii.

##### *Contrasting water concerns:*

In Sharyn Gol, families are mainly concerned about quality of water in the river and the consequent loss of the river as their traditional source of water. They associate this loss with the artisanal and small scale mining and are concerned about the lack of regulation and monitoring of these types of mining. Around Tavan Tolgoi, families are concerned about whether the large coal mine and the water it pumps from deep aquifers will affect the shallow aquifers that the families traditionally use. This is regulated and monitored closely. In both communities, a perception of a lack of transparency, coupled with perceived self-interest of people in positions of power, has contributed to a lack of trust between stakeholders.



## 3.1 Water resources and mining

The impact of mining on local water resources in Mongolia is a primary area of concern that has given rise to local protest movements over the past decade. For example, the first local grassroots movement in Mongolia, Onggi River Movement, emerged as a reaction to environmental impacts of irresponsible gold mining under a weak regulatory regime. A series of well-publicised incidents over water pollution caused by small-scale mining activities in the mid-2000s has contributed to the focus on water issues and the strengthening of the Environment Impact Assessment Law. Numerous studies have also reported deteriorations in the quantity and quality of Mongolia's water supplies due to artisanal, small and large-scale mining (e.g. Brumbaugh et al., 2013; Stubblefield et al., 2005). Consequently, there is deep concern across Mongolia regarding the impact of mining development on water resources.

For large-scale mining projects, experts are routinely employed to carry out water impact assessments to understand and mitigate risk prior to the project being approved. However, the lack of long-term monitoring and baseline data limits the reliability of these impacts assessments. While there are hydrological maps covering Mongolia, these are based on limited

observations and understanding, particularly of the sub-surface hydrology. Historically, state-owned mining companies and other industries undertook limited monitoring of water usage and its impacts on surrounding environment and neighbouring communities. This lack of baseline data poses a challenge to identifying mine-associated impacts on water as opposed to other natural or human-induced impacts. The impacts of ASM on existing water sources are even less well assessed and understood.

Despite the risks, responsible mining can interact positively with water sources if undertaken properly. For example:

- Excess water from mine pits can increase surface flows, which (if the water quality is good) provide more easily accessible water.
- Rehabilitation of mines can be used to restore and enhance riparian areas and vegetation, which can contribute to healthier hydrological systems.
- Developing new infrastructure can improve water supplies and waste water treatment in neighbouring communities.



Figure 23: A mine pit dewatering point into river

## 3.2 Key regulatory aspects

In Mongolia water legislation and policies are covered by a number of laws, and have recently undergone significant change to improve water resource management and increase environmental protection. These include:

- Mongolian Law on Water, 2012 (renewed)
- Water National Programme, Resolution 24, Parliament of Mongolia, 2010
- Setting up 29 water basins of Mongolia, Order 332, Minister of Environment & Tourism of Mongolia, 2009
- Integrated Water Resources Management National Plan Resolution 389, Government of Mongolia, 2013
- Methodology for Developing Water Resources Management Plan of the Basin, Order 187, Minister of Environment & Green Development of Mongolia, 2013
- Rule of Setting Up Water Basin Council, Order 124, Minister of Environment & Green Development of Mongolia, 2013 (Ganbat and Otgonbayar, 2014).

The need to consider mining's impact on water, including the cumulative impacts over hydrological catchments, is reflected in Mongolia's water governance framework, particularly the Mongolian Law on Water, 2012. In 2009, the government established the Law on Prohibition of Mineral Exploration and Mining Activities in Areas in the Headwaters of Rivers, Protected Water Reservoir Zones and Forested Areas (commonly known as the 'Law with the Long Name'). This law outlawed many forms of mining and provided protection for some of the most important and vulnerable water resources. It was also introduced to reduce conflict between herders and mining companies.

Under the Natural Resources Use Fees Law and Water Pollution Fees Law, industrial users of water, including mines, are legally required to obtain water use and water discharge licences, pay water use fees and monitor water use. Industrial users are legally prohibited from altering natural water courses. Under the law, users should be penalised for non-compliance and causing pollution. Domestic water consumption, livestock and herders' water supplies are exempt from water use fees, however, may be charged for the use and ongoing maintenance of wells (Tuinhof and Buyanhisnig, 2010, Upton, 2010).

Although Mongolia has significantly strengthened its regulatory framework regarding water management in mining, there are specific challenges around the capacity to implement regulations and monitor practices. The government lacks staff and resources to engage with mine water experts and understand the often sophisticated technology used in modern mining. This inhibits inspectors' ability to collect sufficient, relevant data and/or regulate poor practice.

### 3.3 Gender, water and herder livelihoods

Herding, like many rural livelihoods, uses inter-generational knowledge of regional water supplies to overcome intermittent shortages of water. The Mongolian landscape is made up of pasturelands with varying water availability, from the Khangai-Khovsgol mountain region to the desert and steppe of the Gobi. This variation in natural resource availability has led to semi-nomadic lifestyles to ensure continual access to good quality water supplies.

#### Lack of transparency and consultation, Sharyn Gol

In Sharyn Gol, herders reported that small-scale mining licenses are often issued by government to companies without community consultation, despite their significant impact on surrounding water resources and herding communities.

In particular, herders expressed concern about a Korean owned small-scale mining company operating in the region, which is believed to be directly extracting water from herders' drinking wells through a pipeline to support their operations. While many herders reported that they have made formal complaints to the government, police and the General Agency for Specialised Investigation (GASI) inspectors about the mine, the mine continues to operate.

The lack of transparency around how government permits are issued, monitored and enforced has led to a lack of trust among stakeholders.

In 2014, the United Nations Development Programme (UNDP) highlighted that water stress is a leading vulnerability for sustainable herder livelihoods and the surrounding ecosystems in rural areas (UNDP, 2014). Herders rely on water resources, including surface water supplies, groundwater springs, pumped

groundwater and rainfall for pasture and vegetation growth. Access to good quality water contributes to the health, nutrition and hygiene of the household, while a lack of good quality water contributes to heightened poverty.

The social aspects of water use are highly gendered as household roles and responsibilities vary. For example, in Mongolia women are more often responsible for duties regarding cleaning, cooking, children's hygiene and dairy product making, whereas men will generally collect water and water the livestock. Therefore, it is important to capture

- Differences in water priorities within the household (especially under conditions of water scarcity)
- Men's and women's involvement and influence in water management plans and policies
- Relationships between modes of transport and water collection
- Gendered dimensions of profit or economic gain and costs from privatisation of water and sanitation. (Hawkins and Seager, 2009)

As mining develops in Mongolia – and access, availability and quality of water changes – it will be important to give ongoing consideration to the gendered dimensions of water. This will be necessary to understand the different impacts on women and men, and then be able to incorporate these considerations into management plans.



Figure 24: Upstream of Sharyn Gol, the river is affected by diversions and dams introduced by mining

### 3.3.1 Natural capital

Water is an essential natural capital that supports development and a wide range of ecosystem services in Mongolia. This includes water surface water from rivers and lakes, and groundwater. The impacts of mining on the value of water as a natural capital to herders may be categorised into changes in:

- river flows, groundwater levels and lake levels
- water quality
- the ecosystems that rely on water.

*“Starting from last year (2013) the quality of the water has started to improve. Previously ASM miners were using illegal chemicals to wash the gold and this was affecting their health. However this has changed and the river health has improved in the last year.”*

Herder Woman living near artisanal and small-scale mines, Sharyn Gol Soum

Mining activities require water, which takes water away from natural surface water and/or groundwater systems. While in wetter climates this loss of water is usually not important, in the water-stressed regions of Mongolia, especially regions that are dependent on groundwater, this loss is significant to herders and other users. For example, a report by the World Bank estimated that known groundwater reserves in the Southern Gobi Region will only be adequate to meet the new water demands for the next 12 years (Tuinhof and Buyanhisnig, 2010).

*“Water quantity has been decreasing... the small-scale mines make lots of ponds which reduces the water flow”*

Sharyn Gol Soum herder

As well as consuming water, mining changes the natural space and time distribution of water in the environment. This is caused by building dams or ponds to store river water, unnatural inflow of water into mine pits, extraction of groundwater or conveyance of surface water from other catchments to supply water for mining operations. The introduction of large ponds increases evaporation and groundwater losses, reduces the natural patterns and variability of water flow, and alters the natural supply of sediments and nutrients to the downstream river and wetlands, impacting on river ecosystems.

Water quality may also be altered by mining due to the:

- exposure of rock to the atmosphere
- chemicals used in mining processes being discharged within wastewater
- accidental spills of chemicals
- erosion.

*“It’s the gold mines who are polluting the river. The coal mine has been operating since 1960s and the river was still clean. Now because of the gold mines, water is not only polluted, but in terms of quantity it’s depleted”*

Herding family, Sharyn Gol Soum

A snap-shot survey of water quality in the Sharyn Gol River in 2014 indicated that small-scale gold mining had a strong influence on water quality, while the large-scale coal mine had less impact on water quality. There was also significant non-mining related activities impacting on the water quality (Box 6: Understanding the water quality of the Sharyn Gol River). The findings from this survey indicate that both mining and non-mining related activities impact on the quality of community water sources. Further research and more water quality sampling is required to truly understand the extent and cause of these changes.

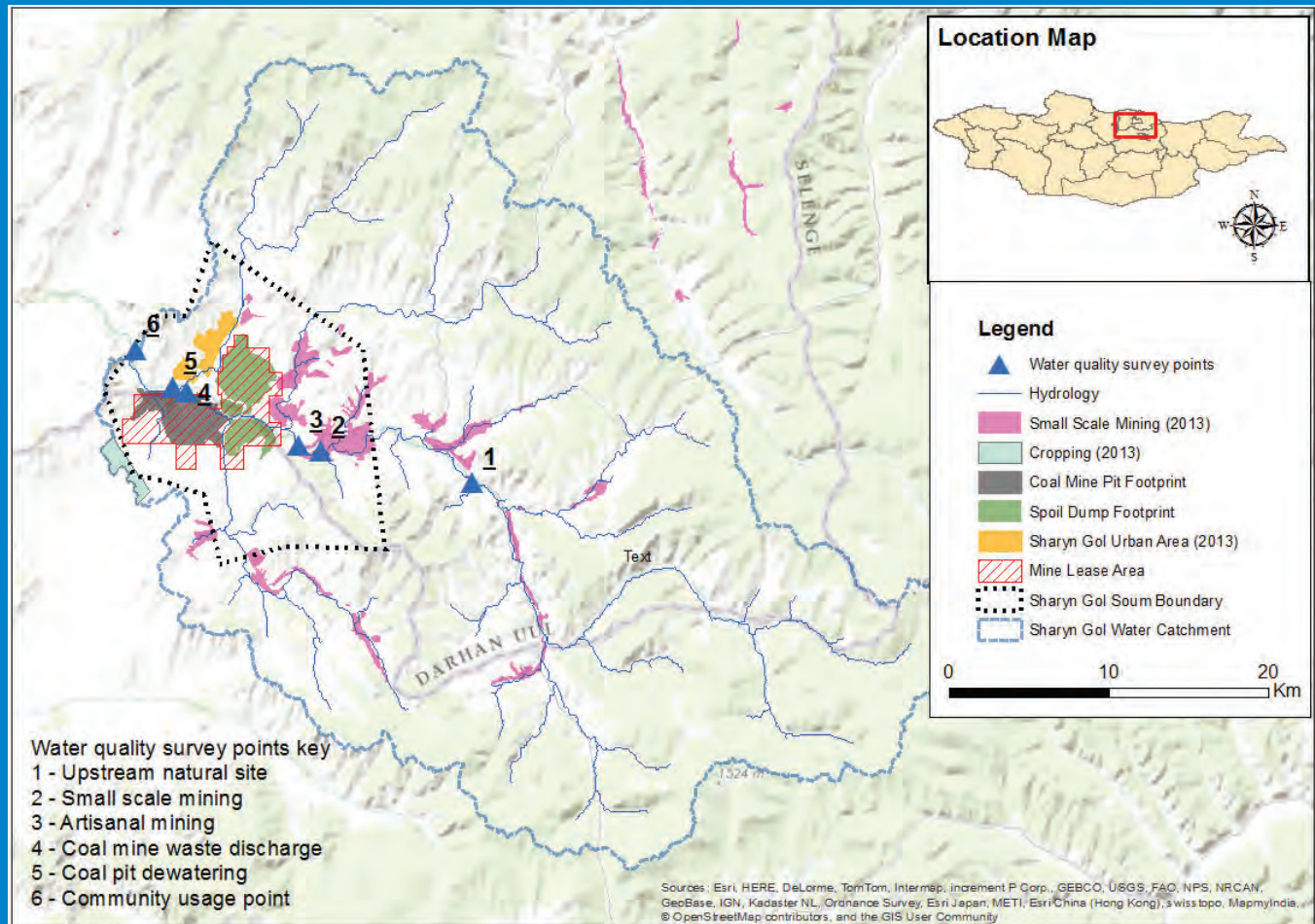


Figure 25: Small-scale mining developed dam (August 2014)



### Box 6: Understanding the water quality of the Sharyn Gol River

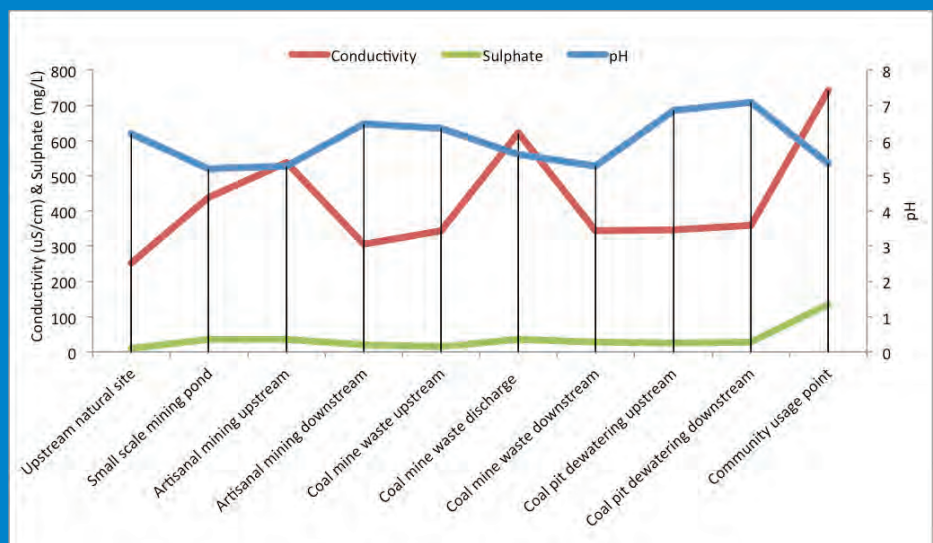
The Sharyn Gol River runs through headwater areas, artisanal and small-scale gold mines, the Sharyn Gol coal mine, the Sharyn Gol town centre, and then flows to downstream pastures. The river water is used by miners, herders, other agriculture industries and for domestic supplies. It has also previously been used for recreational purposes (e.g. fishing, bathing etc.). The path of the river and locations of mining are shown below.



To understand exactly how and why the Sharyn Gol River water quality has changed requires more extensive research. However, simple surveys of basic water quality variables (i.e. how variables change downstream and over time) can help determine the nature and sources of pollution. A survey like this was undertaken during the summer (August) of 2014.

Some of the results are shown here.

The survey results indicate that in the summer of 2014, the water quality is worse in small-scale mining areas and improves through artisanal mining areas due to the dilution effects of natural inflows. Removing water from the coal pit has no significant impact, while the wastewater discharge from the coal mine introduces some salt. Water quality deteriorates between the coal mine and the downstream community usage point, indicating a significant non-mining influence on the quality of water.



### Box 6: Understanding the water quality of the Sharyn Gol River (continued)

This water quality data is preliminary. Repeated surveys and investigations are necessary to identify the main factors governing water quality and potential solutions.

Community involvement in monitoring: The basic data (conductivity and pH) shown in the figure are easy to collect, and this can be done at low cost by community members. With help from experts to interpret the data, and supplemented by monitoring other variables (e.g. metals), a community understanding of the water quality and solutions can be developed.

The research demonstrated that the perceived impacts of mining on water depend on the context, for example the type of mining and type of water resource. This was reflected in the results from quantitative surveys, qualitative interviews and a water sampling survey. For example, in Tsogttsetsii where large-scale mining is prominent and the climate is arid, mining's impact on water quantity was the main issue raised by herders (Figure 26).

In the wetter Sharyn Gol area, however, where all types of mining are present and the artisanal and small-scale mining industry is

prominent, survey respondents indicated that water quality was the most pertinent issue (Figure 27).

Mines can use a range of strategies to minimise stress on existing water resources. These include implementing effective water management procedures and identifying potential conservation opportunities. See Box 7: Waste water management strategies at BHP Billiton's Olympic Dam Mine, Australia for an example of global leading practice in this area.

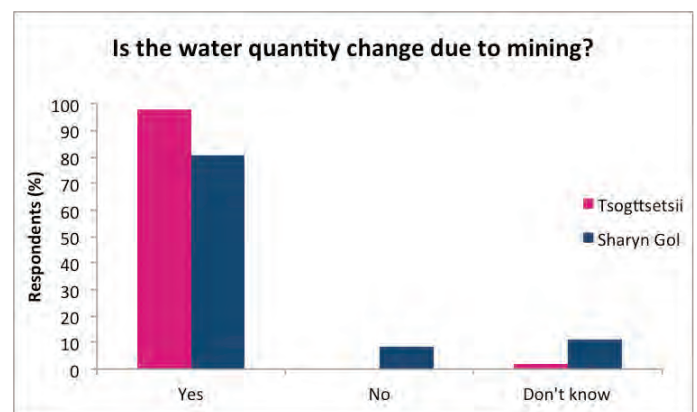
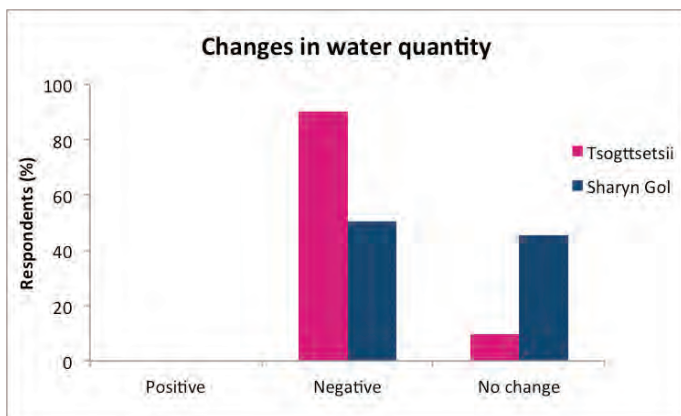


Figure 26: (a) Changes in water quantity and (b) Is the water quantity change due to mining?

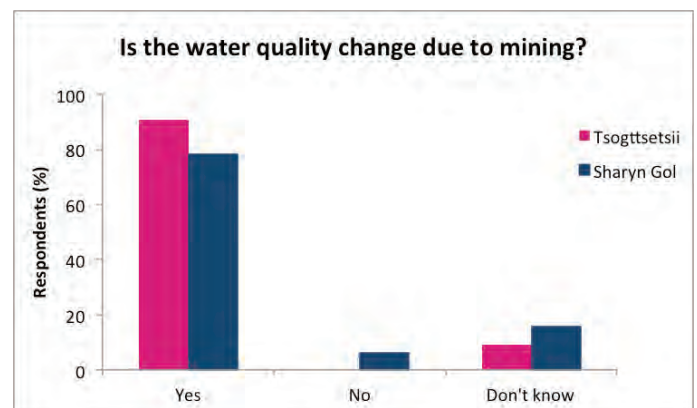
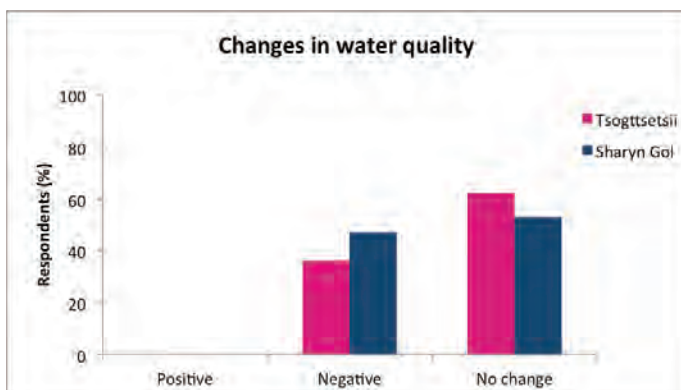


Figure 27: (a) Changes in water quality and (b) Is the water quality change due to mining?



### Box 7: Global Leading Practice: Waste water management strategies at BHP Billiton's Olympic Dam Mine in Australia

BHP Billiton's Olympic Dam mine in Australia is one of the largest copper, gold, silver and uranium mines in the world. It is located in a semi-arid region of Australia where freshwater is scarce, and communities rely on groundwater wells or natural springs of the Great Artesian Basin. BHP Billiton has invested in water management programs to understand the water environment and avoid adverse impacts on other water users. Good practice examples from the Olympic Dam project include:

- Research and data collection to understand the hydrogeology of the regional aquifer system, to identify how the mine project can make positive contributions to water resources.
- Minimising consumption of fresh water through water efficiency measures including on-site evaporation reduction and recovery of water from tailings.
- Finding and using highly saline water from deep aquifers, which has negligible effect on freshwater aquifers and springs.
- Investing AUD\$2.2 million in a Government initiative to improve regional water infrastructure and help landowners use water efficiently.
- Transparency about water management, including accurate daily estimates of water consumption and daily public reporting.

Source: ICMM, 2012

### 3.3.2 Physical capital

Physical capital in relation to water includes infrastructure such as pumps, pipelines, groundwater wells, dams and water treatment works that allow individuals and communities to increase the value gained from natural water resources. Mining has had both a negative and positive impact on herders' access to water-related physical capital.

Mining changes the natural distribution of water, including lowering groundwater levels. This change can make herders' existing water infrastructure, such as groundwater wells, redundant. This issue is compounded by the fact that from 1990 to 2004 the number of operating groundwater wells across

Mongolia has reduced by up to 80 percent (Endicott, 2012) and many of the remaining wells have become too expensive for herders to maintain (Sternberg, 2008).

In many mining regions, mining companies have invested and supported local and regional governments and herders to develop new types of infrastructure to help herders access clean drinking water. For example, as part of their corporate social responsibility programs or resettlement packages, companies have assisted herders install new groundwater wells and pumps if traditional surface water or groundwater supplies have deteriorated or if herders have been relocated to another region.



Figure 28: A water well built by an infrastructure company for truck drivers on the 'coal road' that herders can use free of charge.



Figure 29: A well on the unpaved coal road. Herders are watering their animals, wearing mining uniforms given to them from friends

### 3.3.3 Human capital

A sufficient supply of fresh water is fundamental to maintaining the wellbeing of a society. For herders, the impacts of mining on water resources include concerns about the health risks of deteriorating drinking water quality and the presence of toxic substances, such as mercury and cyanide, in water and the food chain. Although the negative impacts are experienced throughout the household, it is generally the role of women to prepare meals and care for the ill. Therefore, it is often women who are disproportionality impacted by negative health concerns in herder households.

There is a common perception in mining-affected communities of deterioration in quality of river water. However, due to a lack of alternatives, households still continue to use the river for washing, fishing, swimming, watering herds, irrigating crops, and in some instances, for drinking water. This is particularly the case for poorer households that cannot afford to access or pay for quality water supplies. In Sharyn Gol, herders raised concerns about the appearance of the water during the summer and spring time. Herders reported that the river water occasionally turns red. It is assumed that this discolouration is due to artisanal miners, however, the reason for this and accompanying hazards remain largely unqualified.

As well as educating local communities about mine water management, herders' knowledge of hydrology and ecosystems should be used by mining companies. An interview with a respected community member at Tavan Tolgoi highlighted an astute awareness of the local connections between surface water, groundwater and climate, the possible links between groundwater drawdown and salinisation, and the links between water and ecological balance.

Public trust in mining companies is not high, especially in the remote Mongolian countryside. Scientific evidence alone cannot earn the trust from communities. In mine-affected areas, herders have become increasingly cautious about research studies done or funded by resource companies. They now require local oversight and participation in research on the impacts of mining to ensure its ethical clearance. This has been demonstrated by a number of companies including Oyu Tolgoi, Energy Resources and Areva that have implemented environmental monitoring programs. (See Box 8: Water and community engagement at

the Oyu Tolgoi Mine.) If participatory practice is followed and communities are engaged during water monitoring and decision-making, there is opportunity for building social networks across different water stakeholder groups including the mining company, government and herding communities. Maximising use of local knowledge together with the expertise of hydrologists and mine water managers is a key part of finding the most acceptable water solutions.

Mining has the potential to provide considerable investment in human capital via improved health through providing clean and reliable water supplies, supporting education about water, training and/or employing community members to assist with monitoring water.

#### Box 8: Water and community employment at the Oyu Tolgoi Mine

The Oyu Tolgoi gold and copper mine in the South Gobi is implementing a participatory environmental monitoring programme that involves local herding communities. One component of this programme incorporates participatory water monitoring, which involves 26 herder families.

The program aims to increase environmental knowledge among local communities and improve community understanding about their water sources. Under the program, herders participated in training, were involved in quarterly meetings and provided environmental monitoring data. Such a programme has also increased trust between Oyu Tolgoi and the local herding communities (Oyu Tolgoi Project, 2012; Stern, 2014).



### 3.3.4 Financial capital

The reductions in river flows and river water quality from mining can have a detrimental impact on herders' financial capital. Since mining started, herders in Sharyn Gol have needed to invest in groundwater wells or purchase water from suppliers in nearby towns due to potential contamination of the primary water source. The local community was told by officials not to drink the water in the river due to potential contamination and groundwater wells were built in particular areas. However, due to the transient nature of herding, many households do not have consistent access to wells throughout the seasons. Therefore, herders now drive into the soum centre and purchase water from wells.

Purchasing water is not only costly for these herding families, but also takes up time from other daily activities (see Box 9: Impacts on financial capital in Sharyn Gol). For example, some families spend over 140,000 tugrik per annum (approximately AUD \$90) on water costs (not including petrol). For many of these households, this is equal to one tenth of their annual income. Likewise in areas where companies have built wells for herders the cost of petrol has been said to be too high to run the machinery. The specific gender implications are that men spend more time travelling to collect water, and women have the double burden of caring for the herd and conducting their daily responsibilities.

Herders also raised concerns that the deteriorating water sources from mining activities is affecting their main livelihood and financial resource. Herders claimed that reduced water quality and quantity is affecting the size of their herd (e.g. animals are at risk of drowning in unfenced mining ponds), the size and health of cattle and the quality of meat. In highly water scarce regions such as the Gobi, reduced water availability may lead to increased travel distances because of limited water supply.



#### Box 9: Impacts on financial capital in Sharyn Gol

Due to water quality impacts of small-scale mining, many herders near the river use water from new government wells or purchase water from the town.

*"In the early 1990s the river was very clean, where everybody drank. Now it became impossible to drink. The local government built us an electrical water well, because they told us not to drink from the river."*  
Male herder, Sharyn Gol

*"The family goes every second or third day to the soum centre to get their drinking water. The water is paid for (1 litre is 2 tugrik) and at one time we normally bring 450 litres of water"*  
Female family member, Sharyn Gol Sou

### 3.3.5 Social capital

The nature of the hydrological cycle means that water is a shared resource. This common interest in protecting the resource and associated cooperative efforts create social cohesion. On the other hand, as water is a shared resource there are often competing interests and approaches on how it should be managed. These competing approaches can create tensions among groups and individuals. The lack of monitoring, before, during and after mining operations often increases the scope for disputes between mining companies and communities, and within communities and the household.

#### Recreational use of Sharyn Gol River by herding families and locals

*"Sometimes when the river becomes clearer, children go there to swim."*

*"Here along the river there are nice forest areas so lots of people picnic around here. There are a number of people who also try to fish, but there aren't any fish."*

Water also has cultural, spiritual and amenity value in many parts of Mongolia. Degradation of water resources may cause decline in spiritual well-being and cultural identity. Across many parts of Mongolia, after the harsh and isolated cooler months, communities often gather closer together along water sources. They do this to fatten animals and socialise amongst different families and groups (e.g. hold picnics, swim and go fishing). These social and cultural exchanges are central to the fabric of community life. If water sources and streams become unusable or depleted then an important activity for maintaining familial and community wellbeing is lost (Cane, 2014).

Water is physically essentially for survival of these communities and an integral part of the social fabric that must be given specific salience in mineral development planning.



Figure 30: A man collects water downstream of the mining operations before joining his family picnic

# **S4 Pasture Availability**



## 4 Pasture availability

About 71 percent (111.2 million hectares) of Mongolia is covered in common use pastureland<sup>7</sup> and the country is home to one of the largest remaining areas of uninterrupted open access grazing land in the world (Ykhanbai, 2013; McGrath et al., 2007; Ykhanbai et al., 2004). The quality and quantity of this pasture is a mainstay of herder livelihoods. It is also a primary indicator of herders' movements and hardship into the coming year. For example, available quality pasture (and water) will mean a sustainable and fruitful year where movement is directed by the seasons. Conversely, if the quantity of pasture is inadequate, financial and social costs will be accelerated and a household will have to move more frequently and over longer distances to sustain the herd.



Figure 31: Pastureland, white birch and Siberian fir forests surrounding Sharyn Gol

### 4.1 Pasture availability and mining

Across Mongolia, particularly in the south, the country's ecosystems and pastureland are arid, fragile and vulnerable to degradation. Mongolia's extreme temperatures and dry climate mean the country is also highly susceptible to extreme winter weather events or commonly known as *dzuds*. While *dzuds* have always been a phenomenon in Mongolia, in recent years their occurrence and severity has intensified (Natsagdorj, 2005). *Dzuds*, combined with a range of other external factors, are significantly impacting on the availability of, and herder's access to, pastureland. These factors include socio-political changes (e.g. shift from a collective socialist to a democratic market-led society), human activities (types and sizes of herds) and other competing land uses (e.g. crop farming; logging; and special state protected areas). Further, the rapid growth of multiple mining

industries (including artisanal, small and large-scale mining) is placing added pressure on pastureland and further limiting herders' access to available land.

In recent years the size of available pastureland and herders' access to it has been reduced due to competing land uses and human activities, including the expansion of the mining industry. Specifically, available pasture is becoming increasingly fragmented due to legal and illegal mine lease areas, mine infrastructure and services, and artisanal and small-scale mining activities. The research found that herders in mining regions have lost a sizable amount of their pasture and livelihood since the mining industry's recent boom.

<sup>7</sup> Rangeland typically refers to primarily native vegetation, whereas pastureland tends to include both native and non-native vegetation. In Mongolia, much of the academic literature refers to open land as 'rangeland' or 'grasslands'. However, much of the literature from the private sector, including the mining industry, refers to open land as 'pastureland'. For the purpose of this handbook open land will be referred to as 'pastureland' or 'pasture'.



## 4.2 Key regulatory aspects

Pasturelands across Mongolia have always been used freely by herders for grazing purposes (Purevsuren, 2001). There are currently no national regulations or laws that protect herders' customary land rights and access to pastureland (Tumenbayar, 2002). The most relevant law protecting herders' use of land is the Mongolian Land Law, introduced in 2004. The Land Law contains provisions to regulate access and possession of land, but is often considered unclear and difficult to follow (Fernandez-Gimenez & Batbuyan, 2004; Cane, 2014). Under the Land Law, herders are able to obtain long-term 'leases' from soum level governments. Winter and spring shelters are leased to herders for a 30 year period; and herders are also able to apply for an additional 30 year extension. However, all pastureland remains 'common use' and informally shared by multiple herder households, and not owned or leased by any one individual. Consequently, herders only maintain the right to 'use' not 'own' surrounding pasture.

In the absence of formal regulatory provisions, informal laws and customary land rights are used to govern how to resolve disputes, and distribute households' access to and use of natural resources (including pastureland) (PALD, 1993; Fernandez-Gimenez & Batbuyan, 2004; Cane, 2014). A 'higher law' also exists that states that natural resources (e.g. pasture and water) cannot be owned by a particular individual or family and therefore any herder in need of pasture may graze on it (Cane, 2014; Fernandez-Gimenez, 2002).

Restoration of mine-affected pastureland is addressed under a number of national laws and regulations, including:

- The Amendment to Minerals Law, 2014
- Law of Mongolia on Environmental Impact Assessment, 2001
- Regulation on the Temporary and Permanent Closure of Mines.

Despite these legal requirements, often a lack of resources and capacity, and unclear joint environmental monitoring arrangements between national, aimag and soum governments inhibits government's ability to properly:

- understand the extent and scale of mining's impact on pasture
- monitor mining operations, rehabilitation activities, infrastructure developments and overland vehicle travel
- regulate poor or illegal practice.

Further a lack of transparency and perceived corruption within and between company and government has contributed to mistrust among local stakeholders about company and government led rehabilitation and reclamation work.



Figure 32: Animals grazing on pasture outside ger

## 4.3 Gender, pasture availability and herder livelihoods

Mongolia has been a nomadic based society for thousands of years, in which herders move with their livestock across pastures on a seasonal basis (Tumenbayar, 2002). Currently about 30 percent of Mongolians live as herders and rely on animal husbandry as their primary livelihood source (Robin and Smith, 2014). Pasture is one of the critical natural resources required to sustain herds. Without access to quality and an obtainable quantity of pasture, herder livelihoods become stressed, or unsustainable.

Large-scale, small-scale and artisanal mining and their supporting infrastructure developments have contributed to reduced pasture availability for herding practices through:

- removal of pasture within the mine footprint
- degradation of pastures directly from traffic on unpaved and unplanned track networks and indirectly through dust created by vehicles on the track network
- creation of barriers (such as fences) to movement across pasture.

This has had a significant impact on herder livelihoods in a number of ways, including:

- increased land-use competition and reduced availability of natural resources
- altered traditional herding skills, practice and movements

- changed income-earning ability of herders
- increased competition and conflicts over natural resources
- complete relocation from their lands (discussed in Resettlement).

Responsible environmental management requires understanding changes incurred on the environment and the experiences of those dependent on it. Observing the linkages between the roles of women and men, natural resource use, local knowledge and cultural values informs policy makers on land use and household livelihoods. Generally women are responsible for milking animals, making dairy products, care of young animals, cooking and cleaning. Whereas men often herd animals, collect water, slaughter animals and travel to soum centres on errands. The roles of men and women in herder lifestyles differ and therefore have to be considered when understanding the impact of pasture degradation on herder livelihoods.

Household participation in decision making processes connected to natural resource management is crucial to developing sustainable minerals development. The research suggested that women in Mongolia were more often involved in local level meetings and community decision making processes. However, men more regularly are involved in directing resources and environmental policies within formal institutional settings and leadership roles.

### 4.3.1 Natural capital

Pasture is a natural capital that is critical for sustaining herder livelihoods. Pasture provide an asset base for their livestock and also helps provide assurance against soil erosion and is important for water drainage.

Mining requires the removal of large amounts of land and soil waste to extract mineral content. Consequently, one of the major impacts associated with mining is the significant and often permanent changes to landscapes and landform, which makes other previous land uses, like herding and farming, impossible. Many mine-affected regions in Mongolia have experienced significant changes to landscape and pasture availability. Quantitative research from herder households in Tsogttsetsii and Sharyn Gol Soums show that herding families directly attribute changes in pasture availability to mining (Figure 33).

In some parts of Mongolia, large-scale mining developments have been significant, rapid and concentrated. In some areas, the growth of mining has increased at such a rate that herding has become unviable. GIS and remote sensing analysis undertaken within the Tavan Tolgoi mine deposit in the Ulaan Nuur Valley illustrates this growth (see Box 10: Tavan Tolgoi mine footprint expansion). This valley has traditionally been the summer grazing land for herders in the area due to pasture and water availability in the hotter months. From 2000 until 2014, the Tavan Tolgoi

mine footprint grew from approximately 32 hectares to 3,191 hectares. The growth of the mine footprint over existing pastureland correlates with recent data showing reductions in pastureland in the Tsogttsetsii Soum over time. Research shows that the total area of dedicated pastureland in Tsogttsetsii Soum has decreased by 2,416 hectares in two years because of mining expansions – from 688,238 hectares in 2011 to 685,822 hectares in 2013 (Centre for Policy Research and Social Sustainability Services, 2014).

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*“There is an environmental inspector from GASI in the soum who is supposed to monitor the environmental issues in the region. When the inspector attended a bagh meeting last fall to discuss water and pasture issues he failed to address any of the issues raised.”*

Herder, Tsogttsetsii Soum

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Other types of mining, including artisanal and small-scale mining, also pose significant threats to available pastureland. For example, in Sharyn Gol Soum, herders are competing with multiple types of mining land uses for viable pastureland. Figure 34 illustrates the boundary of the Sharyn Gol Soum and the range of competing mining and urban land uses within it.



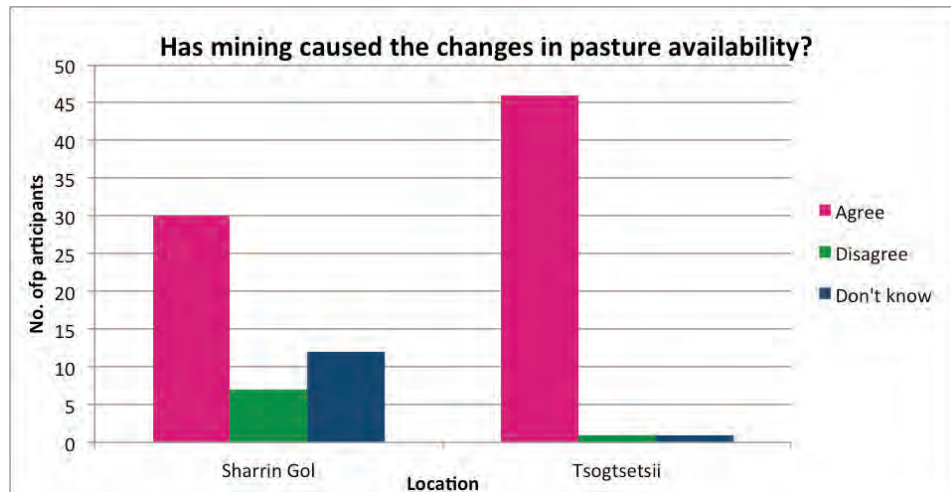
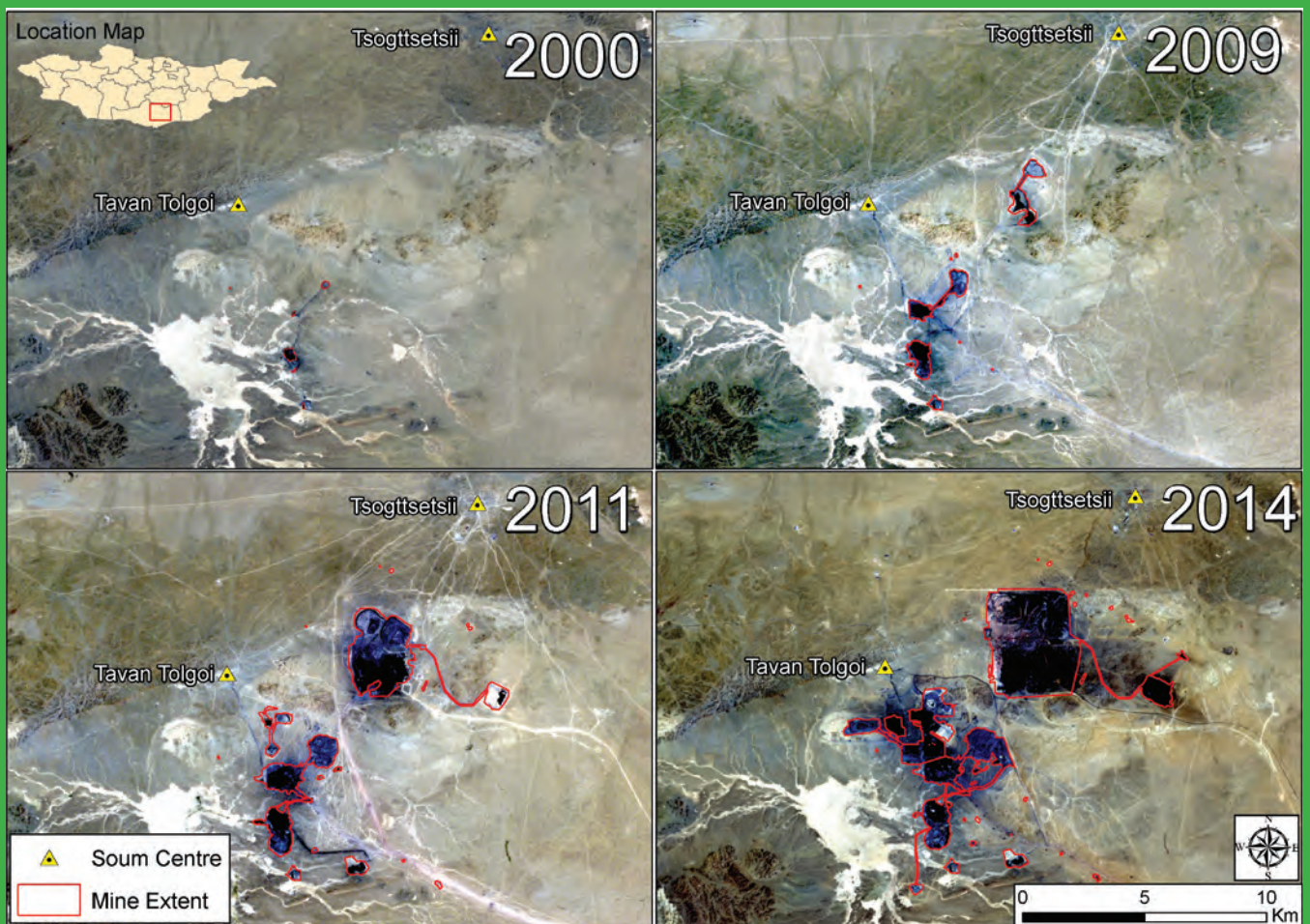


Figure 33: Herder perceptions of changes to pasture related to mining as opposed to other human factors

#### Box 10: Tavan Tolgoi mine footprint expansion

True colour Landsat satellite images of the Tavan Tolgoi coal mine footprint, and the townships of Tavan Tolgoi and Tsogttsetsii. The maps illustrate the rapid expansion of the mine footprint (highlighted in red) from 2003 (top left) to 2014 (bottom right)





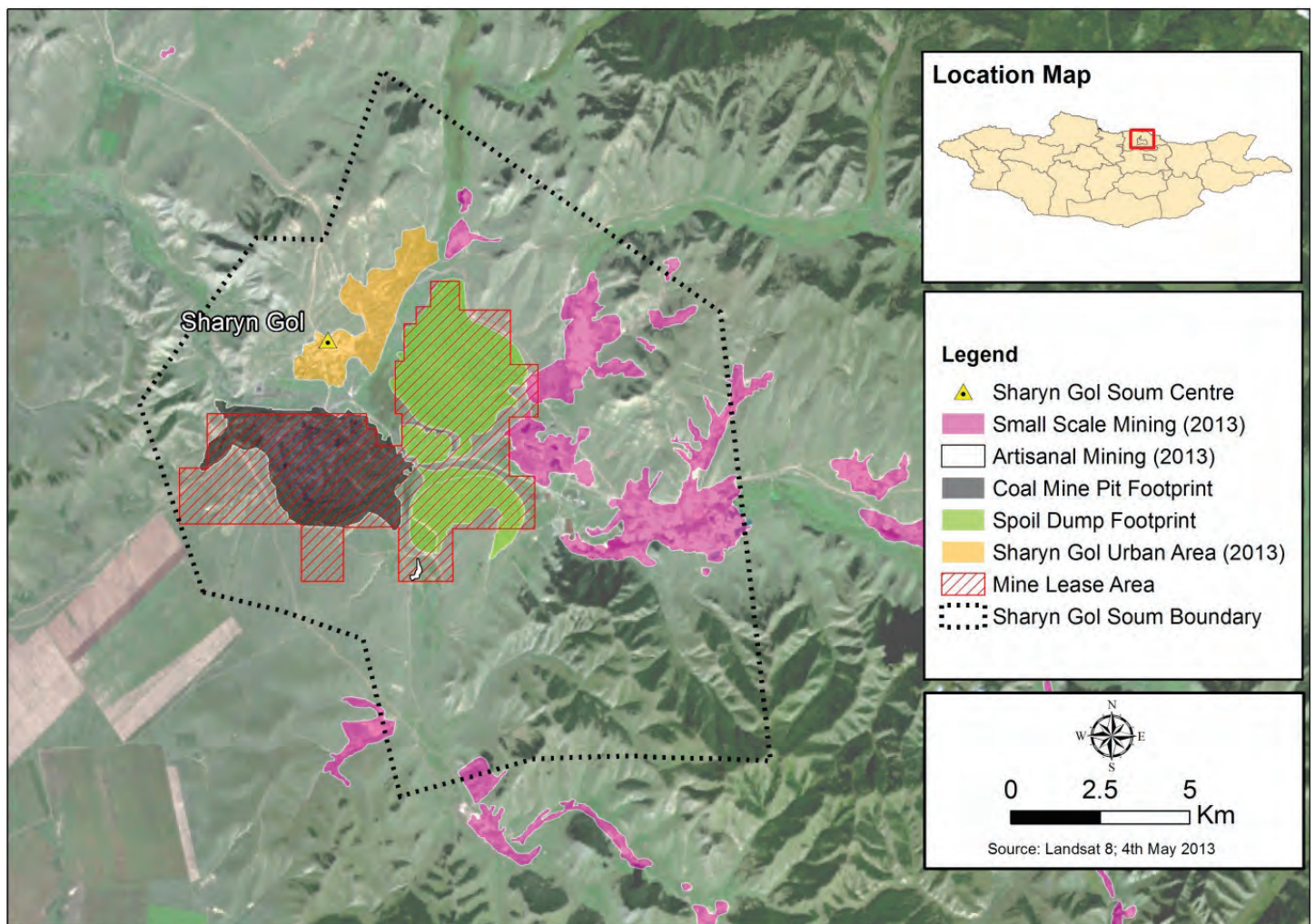


Figure 34: Competing land uses in Sharyn Gol Soum identified with manual satellite image interpretation of 2013 Landsat imagery

With appropriate reclamation and rehabilitation, mining's impact on pastureland can be minimised. Under the Minerals Law, companies are required to pay a 'rehabilitation bond' to the Soum Government to assist rehabilitation activities. This fee totals 50 percent of the estimated costs to restore and protect any impacted natural resources. Despite this legal requirement, the law is often not adequately enforced as mining companies do not always transfer their 'rehabilitation bond' or the funds are not properly spent by the responsible government authority,

the Soum Government. As a consequence, reclamation and rehabilitation practices across Mongolia are varied and can include companies:

- undertaking progressive rehabilitation and monitoring and ensuring the post-mined landscape is safe, sustainable and productive
- simply filling in open pits and shafts
- not undertaking any rehabilitation and leaving pits unfilled.

#### Box 11: Transparency and Rehabilitation in Sharyn Gol Soum

In Sharyn Gol, 'rehabilitation companies' receive permits from the Soum Government to undertake restoration of mine-impacted land. However, herders reported that these companies are only fronting as 'rehabilitation companies' and instead are actually mining for gold rather than restoring the land. Observations during fieldwork confirmed that the land was not being rehabilitated but was being further extracted and processed off-site. Overall there is a perceived lack of transparency around the tendering process for rehabilitation and reclamation work. Likewise, there is also a perceived lack of government resources to adequately monitor and regulate this process.





Inadequate government resources and capacity to monitor and enforce regulation also inhibits the effective rehabilitation of mine-affected land across Mongolia. In particular, a number of government organisations do not have adequate capacity to fulfil their official functions in relation to environmental monitoring and protection. For example, in many mine-affected areas local governments lack the capacity, skills, technology and resources to monitor mining and rehabilitation activities and to penalise poor practice or non-compliance. Further, high personnel turnover of government inspectors also weakens institutional resources, memory and capacity to monitor mining operations and enforce regulations. Joint environmental monitoring arrangements

between national, aimag and soum inspectors also creates confusion around the different inspector agency's functions, reporting lines and level of authority, which inhibits the effective monitoring efforts.

Legislative action could be taken to protect herders' access to pastureland over other multiple land uses, including mining. This may involve protecting land from mining and development that is of significance to maintaining herder livelihoods. For example, the Queensland Government in Australia developed legislation to protect key food producing land in Australia, known as 'Strategic Cropping Land' (see Box 12).

#### Box 12: Protecting highly productive agricultural lands, Queensland, Australia

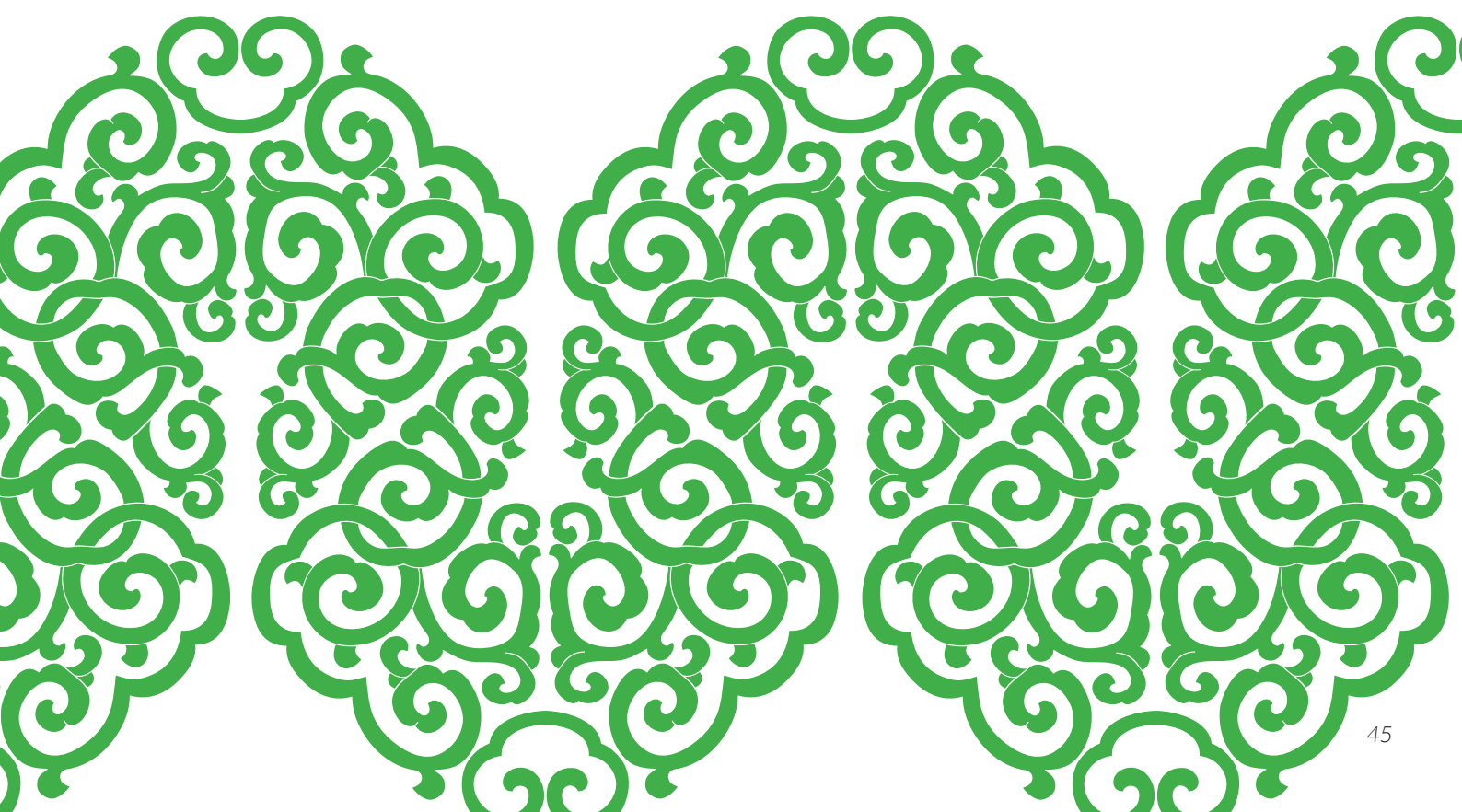
As mining expands into agricultural areas in Queensland Australia, there is increasing community concern about the impact of mining, particularly coal mining on agricultural productivity (Lechner et al. 2014).

Recognising the importance of highly productive agricultural lands (and to reduce conflict between these competing land uses) legislation has been enacted to identify and protect "land that is, or is likely to be, highly suitable for cropping because of a combination of the land's soil, climate and landscape features" (Queensland government 2014).

Similar policies exist in other jurisdictions in Australia (e.g. New South Wales Government 2013).

In these high productivity agricultural areas it is recognised that agriculture has priority over other proposed land uses. High productivity agricultural regions are first identified through GIS mapping using remote sensing data. In these regions other forms of land use should not affect or influence the suitability of the lands for agriculture. Organisations seeking to operate in these areas (e.g. mining companies) need to meet an assessment criteria. Key issues that may affect suitability for agriculture include changes that may impact on how farm managers may conduct their operations, and changes to yield quantity or quality.

(Lechner et al. 2014; Queensland Government, 2014; New South Wales, 2013)



### 4.3.2 Physical capital

Across Mongolia, large-scale mining companies have constructed infrastructure developments or physical capital (including electricity, paved roads, fences and a railway) to support their operations. These developments provide potential opportunities for herding households, but also pose a serious threat to pasture capacity and availability if not managed responsibly.

*"Compared to other soums, mining has helped the locals... the infrastructure has developed along with mining. We have electricity and paved roads."*

Deputy Governor, Tsogtsetsii Soum

In recent years, planned and unplanned mining infrastructure (particularly road networks) have expanded rapidly in line with mining activities (see Box 13). These infrastructure developments can be mutually beneficial for companies and local households as they support a company's operations while providing herders with basic infrastructure to improve productivity. During the research, community residents and herder households along mine transport routes experienced some positive benefits from company developed physical capital, including improved access to basic infrastructure like paved roads, telecommunications and reliable electricity. Such developments have enhanced herder mobility, improved their access to economic markets and maximised productivity.

However, the majority of mining infrastructure networks are not properly planned and dissect the landscape and increase land-use competition on already fragile and limited pastureland (see Box 14). Further, informal road networks and overland vehicle travel cause soil erosion and the formation of gullies, which severely degrades the quality and availability of pasture.

In recent years, road-related erosion has grown as a result of increased mining activities and vehicles in the absence of established road networks (Batkishig, 2014). Nationwide, there are approximately four times as many vehicles tracks than necessary. Estimates suggest that unregulated overland travel has degraded between 1.5 and 1.7 million hectares of land (Batjargal, 2003 and Batkishig, 2014). For example, in Tavan Tolgoi region since 2000, there has been a 1,600 percent (391,000 ha) growth in impacted areas from increased traffic movements where impacts were defined as areas with three or more roads (see Box 15 in Dust chapter for more information). This unprecedented growth demonstrates that there is limited coordination of infrastructure planning and development, and limited government capacity to monitor and penalise off-road truck movements.

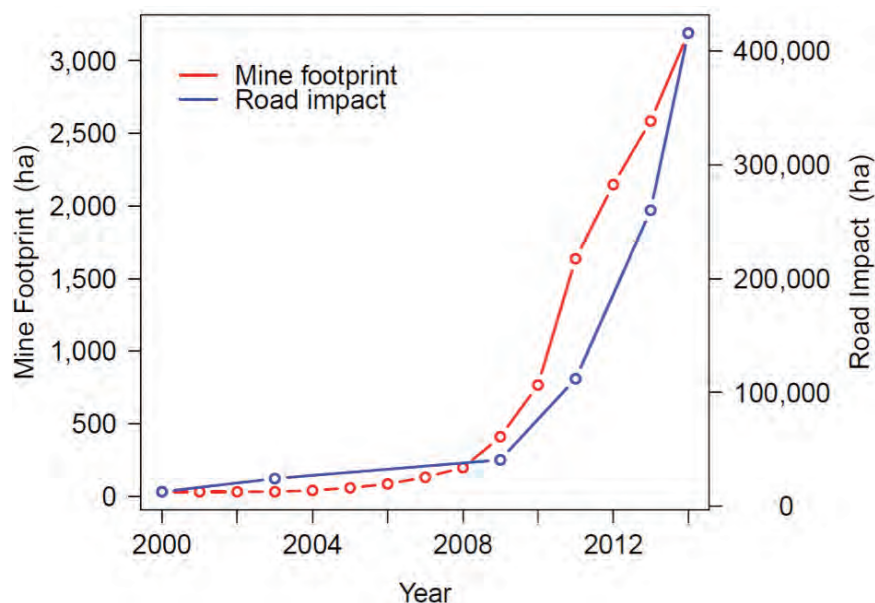
*"A paved road was also built across our previous grazing land which reduced their available land to graze. Despite this, trucks still drive next to the road and on our remaining grazing land – we can't stop them."*

Herder, Tsogtsetsii Soum

#### Box 13: Mine footprint and road network expansion in Tavan Tolgoi, Umnogovi (2000 to 2013)

Remote sensing and GIS research undertaken within the Tavan Tolgoi region illustrates the mine footprint and road impact area expansion from 2000 to 2013 as identified with manual image interpretation of Landsat Satellite data. The graph demonstrates the relationship between mine area expansion and road impacts.

The rapid mine growth between the years 2009 and 2011 coincides with the opening up of the mine to the international market in 2009 and the completion of the Coal Road in 2011.



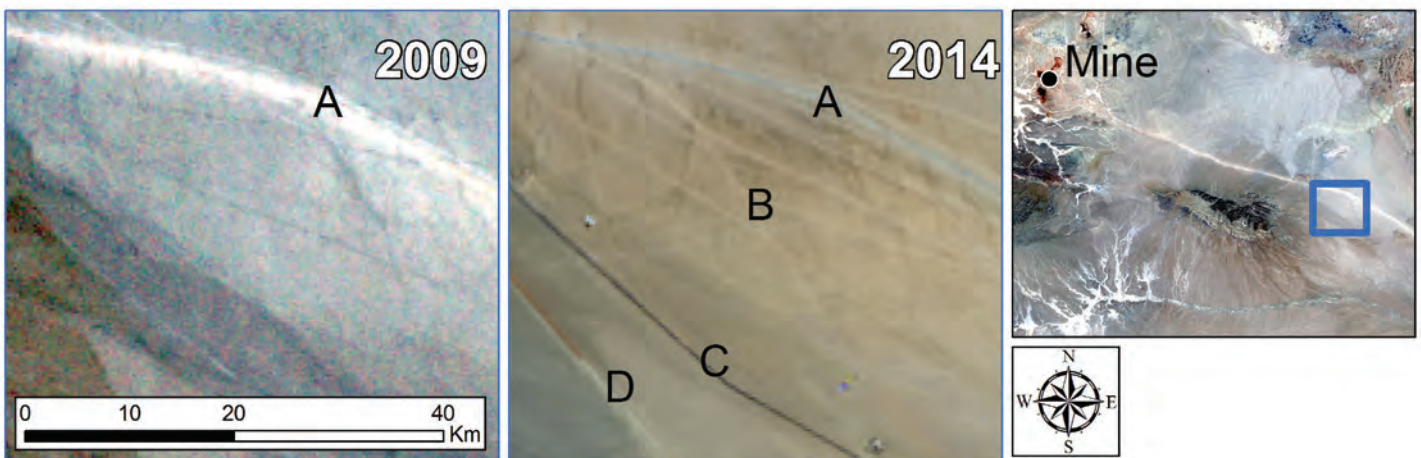
#### Box 14: Mining transport routes in Tavan Tolgoi, Umnugovi

Three mines currently operate within the Tavan Tolgoi thermal and coking coal deposit in Umnugovi, including Erdenes Tavan Tolgoi, Energy Resources LLC, and Tavan Tolgoi Joint-Stock Company. These operations are supported by extensive planned and unplanned infrastructure networks, which assist the transportation of coal. Existing mine-supporting infrastructure includes:

1. The original unpaved border crossing road that was colloquially named the Coal Road during the expansion of mining (A): an unpaved dirt road which runs through Umnugovi region to the Chinese border. At peak production, the Coal Road accommodates about 6,500 hauling trucks between Umnugovi and the border of China (Cane et al., 2014).
2. Unpaved and unplanned track networks (B): extensive unplanned track networks surrounding the paved and unpaved Coal Roads.
3. The new paved Coal Road (C): a 245 kilometre paved road that connects Ukhaa Khudag to the Chinese border (similar route to unpaved Coal Road). The road was originally built by Energy Resources in 2011 as part of a 10-year build-operate-transfer concession agreement with government, whereby Energy Resources could charge tolls. However, local informants reported that the government officially gained ownership of the paved Coal Road in June 2014.
4. Railway development (D): a 260 kilometre state-owned railway development connecting Tavan Tolgoi coal field with the Chinese border (in construction).

While the new paved Coal Road was developed to boost productivity and minimise environmental impacts (including further fragmentation of pastureland), the research found that few transportation trucks use the paved Coal Road because of high toll costs and haulage weight restrictions and instead drive on dirt tracks parallel to the road. To gain access to the road, transport companies must pay a toll to the government, which many deem as being too expensive. Further key informants reported that government owned mining company trucks are unable to travel on the road as it cannot support their haulage weights.

Evidence suggests that a lack of strategic infrastructure planning and limited monitoring or penalties for off-road travel is having a cumulative detrimental impact on surrounding pastures and soils.





### 4.3.3 Human capital

The encroachment of mining developments and activities on pastureland is affecting the domestic routines and workloads of herders, altering traditional herding practices and forcing some herders to seek alternative livelihood opportunities and skills.



Figure 35: Herd grazing near small-scale mining operations in Sharyn Gol region

Since mining's encroachment, herders' workloads have significantly increased. For example, often male herders now spend longer periods supervising their livestock. They are unable to roam freely due to the increased risk of livestock injury, drowning or death from increased traffic, mining pits and

washing ponds that are positioned on traditional pasture lands. Many male herders in mine-affected areas are also required to travel further distances to herd their animals as good quality pastureland is sparse in the area they reside. With men travelling further with animals to find quality pasture, or to watch the herd more closely, women are often required to assume men's traditional roles and responsibilities, increasing their work burden.

The increasing presence of mines across pastureland has forced some herders to seek more modern and flexible transport options to herd their livestock. For example, some herders reported switching from using horses to motorcycles to herd their livestock as they are easier to navigate and manoeuvre around mines.

*"I'm a victim too. I have many horses and the place where I held my horse is now a waste dump of the mine...So now I travel 20-30 kilometres away to herd my horses. It means I travel 50-60 kilometres per day."*

Herder, Tsogttsetsii Soum

Decreases in available natural resources (including pasture) and other push factors (e.g. climate and socio-political changes) have forced some herders to relocate to soum centres and transition to waged work as they are unable to maintain their herding livelihood. In these instances, herders are required to obtain new skills and knowledge so they can pursue alternative livelihood opportunities (also see economic displacement impacts in Chapter 6 Resettlement and displacement)

### 4.3.4 Financial capital

Mining's encroachment across pastureland has a direct impact on herders' financial capital or financial resources. These financial impacts have been both positive and negative; however few families reported experiencing positive financial rewards.

One of the primary financial rewards discussed by herders was by those households residing alongside mining activities and mining-developed transport routes. In these cases, herders experienced improved connectivity and access to new economic markets. For example, during the exploration phase of Oyu Tolgoi, herders were able to sell meat and dairy products to the workers. Likewise, along haulage routes, some herders have opened up *guanz* (roadside cafes) and have seen a substantial increase in their household incomes. Operating roadside *guanz* has been a particularly useful alternative livelihood option for women of single headed households. Respondents suggested that operating small cafes and stores alongside mines had created substantial cash-based wealth that was not available to them from a herder livelihood. However, these informal businesses were highly vulnerable (economically and socially) due to the boom/bust nature of the mining industry and the safety issues experienced by single women servicing a largely male-dominated clientele.

However, the majority of herders reported negative impacts on their main income-generating activity of grazing livestock as it relies heavily on abundant and good quality pasture. In some cases, herders in mine-impacted areas are unable to graze livestock close to home due to limited pasture. They are forced



Figure 36: Guanz along the Coal Road, Tsogttsetsii Soum



to hire other families in non-affected regions to care for their livestock. Payments for this arrangement are varied, but can include a cost per head of animal and/or a percentage of sales from animal products (e.g. cashmere). This creates a direct financial burden for many already vulnerable herder households. For example, if a herder household has 200 animals that are cared for by another family and it costs 2,000 tugrik per animal per month, each year it could cost the family up to 4.8 million tugrik and they could lose up to 40 percent of their income from cashmere and wool sales.

*"Only about 40 herder households live in the impacted zone around Tavan Tolgoi. Most of them give their livestock to other families who live far away from here. Our livestock also grazes in another area and other family herds them. We pay 1500-2000 tugrik per sheep/month. The families also get 40 percent of the wool sales from the animals."*

Resettled Herder, Tsogttsetsii Soum

As extensive mining developments across pasture makes herders' domestic workloads more time consuming, evidence suggests that herders now have less time available for other income-generating activities (including producing animal products such as wool, dairy and cashmere), which can negatively affect their potential financial capital base.

#### 4.3.5 Social capital

Given the harsh climate and limited natural resources, many herders tend to cooperate and live together in small family or community groups, which are commonly known as *khot ail*. *Khot ails* tend to move together and exercise rights over land in a particular area or region. Often the greater environmental degradation, the more rigid a groups land boundaries and rights become due to increase competition over land.

*"There are tensions between the families moving from this region and the regional Khanbogd and Bayan Ovoo herders. There are territorial disputes, which always creates tension. Most families coming from here have a large number of herds and camels, which require a large amount of area. The original herders from Khanbogd and Bayan Ovoo tell them that they have been in their area too long and need to go back. The types of tensions include arguments and quarrels (not actual fighting)."*

Female Herder, Tsogttsetsii

The presence of large-scale, small-scale and artisanal mining and their pressure on available land is exacerbating tensions between herders over access to good quality pasture. Traditionally, under customary land rights, herders would refrain from herding their livestock on another herder's pasture (particularly during winter). However, the increased pressure from mining developments means pasture is limited so herders have no other choice but to graze their animals on another herder's land. During the research, herders reported tensions between households who moved their livestock to a new area and the herders who already reside in those areas.

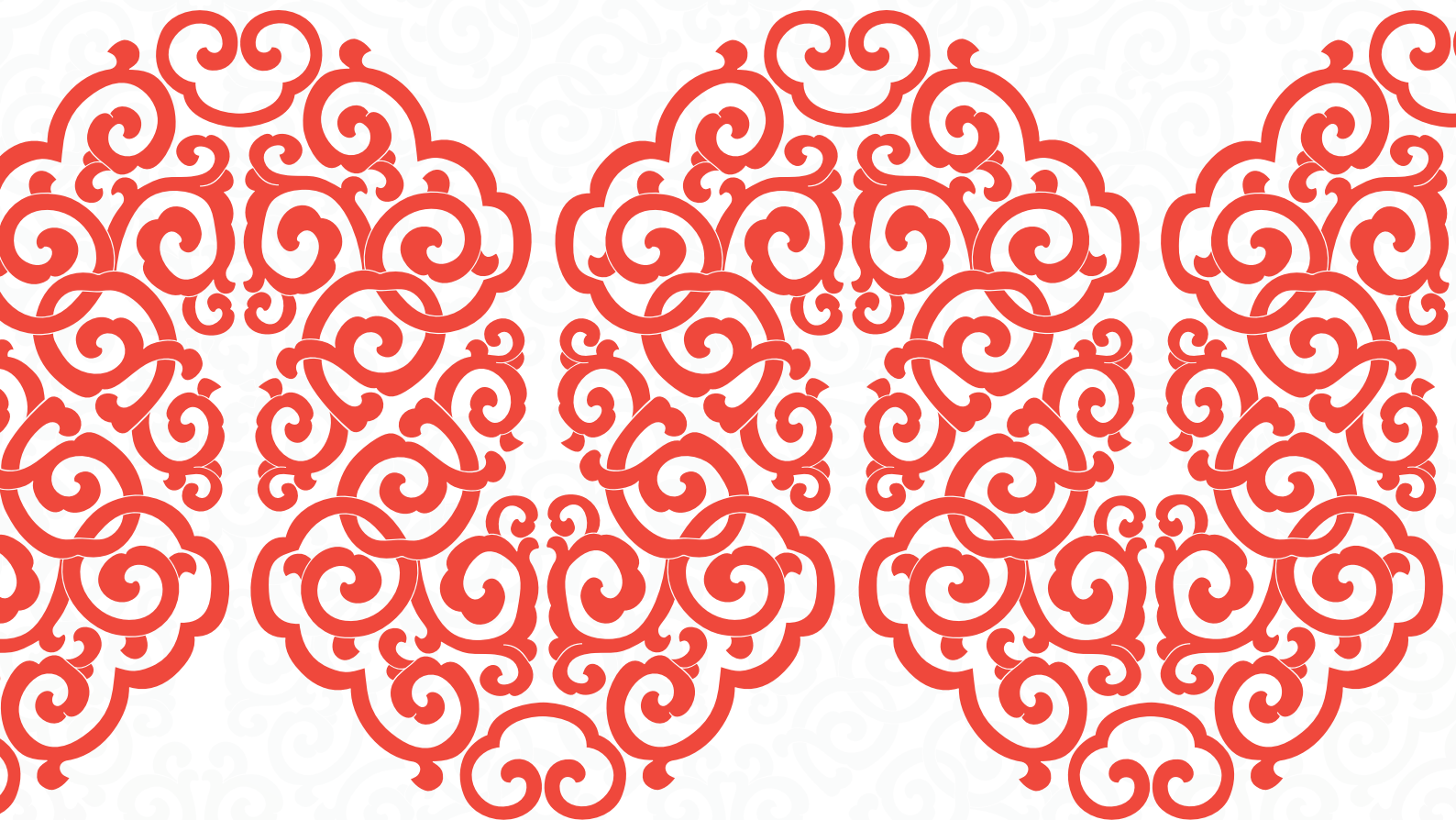
These tensions can lead to a breakdown in herder social relations and networks, which places added strain on herder households. An area of concern raised by government organisations was the impact of these conflicts on household gender relationships and dynamics, and the potential use of alcohol and enduring violence as coping strategies in the face of livelihood loss.

For a pastoral nomadic society, the land has particular meaning and consequence. The Sustainable Livelihoods Approach applied in this context revealed to the research team how basic botanical and climatic aspects of pastureland are being impacted by human activities. It also underlined the essential need to consider the connections between these sources of capital when mining activity is to be undertaken.



Figure 37: Animals grazing around multiple ger

# s5 Dust occurrences



## 5 Dust occurrences

Dust is currently one of the most visible ways people encounter and experience the impacts of mining activities in Mongolia. However, dust and dust storms are not a new phenomenon in the country. Globally, Mongolia is part of one of two giant new dust bowls – one centred in Asia including north western China and western Mongolia, and the other in North Africa (Larsen, 2012).



Figure 38: Car travelling 100 metres ahead in naturally occurring dust storm (Cane, 2014)

Many parts of the country, particularly the semi-arid Gobi region, are dry and susceptible to strong winds that create episodic dust events throughout the year (Batjargal et al. 2006). In the Gobi Desert region, natural sand and dust storms can occur between 30 and 120 days in each year (Figure 39) (Dagvadorj et al., 2009).

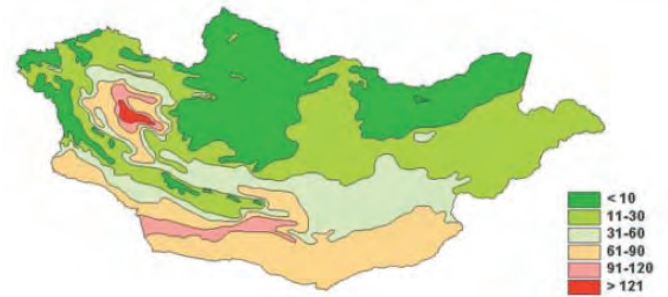


Figure 39: Geographical distribution of dust storms across Mongolia (Dagvadorj et al., 2009)

### 5.1 Dust occurrences and mining

In recent years, dust pollution and episodic dust events have become more intense and frequent in mining regions. Remote sensing research undertaken in the Gobi Desert found that there has been an increase in dust since the onset of mining, particularly around mining activities (extraction, storage and transportation of minerals) and ancillary developments (Bonilla and Neeti, 2013). While dust concentrations in and around mining sites have improved since the 1980s and 1990s (likely due to improvements in mining technology and suppression controls), dust concentrations at many mining areas still exceed Mongolian

maximum allowable limits (Lkasuren et al., 2007 and Jadambaa et al., 2015). If left uncontrolled, these dust emissions can negatively affect surrounding landscapes, settlements and animals.

Qualitative research in Mongolia indicates that the two main contributing sources to dust emissions in mining regions include mining truck movements and mine stockpiles (Sukhgerel et al., 2014). Survey results from Tsogttsetsii reaffirmed this and indicated that herders perceive both unpaved roads and coal stockpile dust as the main contributors to dust pollution in their area (Figure 40).

Causes of increased incidence of dust

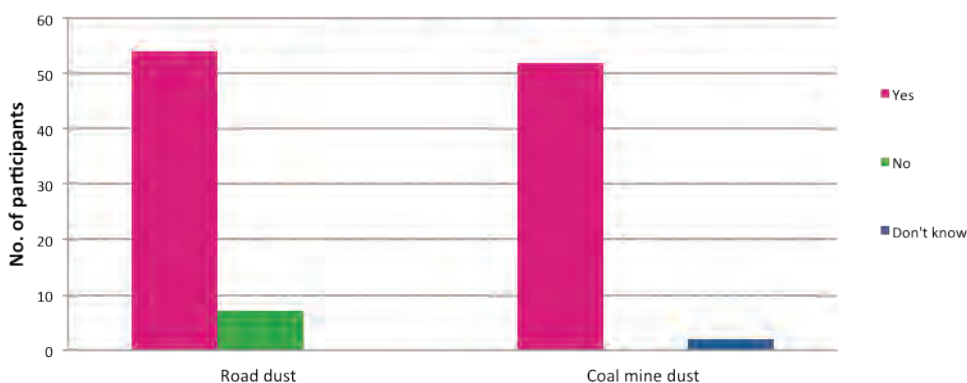


Figure 40: Perceptions of Tsogttsetsii soum households towards dust related changes over an eight year period (2006-2013)



## 5.2 Key regulatory aspects

In Mongolia, air quality and emissions from mining activities (including particle matter and dust) are regulated by the Law on Air 2012, which outlines the use and protection of the atmosphere. Under this law, the government sets limits on discharges of emissions by all sources through the issuing of permits. By law, companies are required to undertake ongoing air quality monitoring in and around sites and notify the public and local authorities when air quality standards are exceeded. The relevant Mongolian National Standards (MNS) for air quality are listed below:

- MNS 4585:98 and MNS-3384:82 for sampling, and MNS-4048:88 for analysis
- MNS 3384:1982 Atmosphere. General requirements for sampling
- MNS 3383:1982 Atmosphere. Pollution source, terms and definitions
- MNS 5885:2008 Accepted concentration of air polluting substances. Technical general requirements
- MNS (ISO) 4225:2001 Air quality. General introduction
- MNS 5365:2004 General issues of air quality. Fine size dust determination method.

The current legal requirements relating to air quality and dust emissions are not specific to mining regions and lack clarity around company requirements for monitoring air quality and dust emissions. As the main law relating to air quality, the Law on Air 2012 primarily covers issues pertaining to air quality in Ulaanbaatar and other cities. There is less focus on industrial activities in rural areas despite the growing public concern over the health impacts of dust in coal mining areas. There is also no clear regulation or standards that specify a company's legal requirements and responsibilities to monitor and control dust emissions. For example, in the United States and Canada, the legislation and project approvals provide specific and detailed expectations about controlling emissions of particulate matter from coal mining (OEH, 2011).

Government monitoring and enforcement of mining regulations (including dust emissions) is carried out jointly by national government (General Agency for Specialized Investigation or GASI) and local authority (*aimag* and *soum*) environmental inspectors. Despite this joint arrangement, the current legal frameworks do not specify the responsibilities of the different government authorities at each level. This lack of clarity creates confusion about each agency's function, authority and reporting lines. Further, the resources and capacity of each agency is limited, which affects the government's ability to effectively monitor and regulate dust emissions and overland vehicle travel.

## 5.3 Gender, dust and herder livelihoods

Given the dry environment and historical occurrence of natural dust storms, Mongolian herders are familiar with such weather events and have learned to adapt when they occur. Many herders are able to observe changing weather patterns and can predict dust storms and alter their domestic routines and behaviour before they begin. For example, when a dust storm is looming, herders will graze their livestock closer to their *ger*, avoid hanging washing and drying foods outside and ensure their *ger* is completely closed to avoid dust getting inside.

Despite herders' knowledge and adaptability to natural dust storms, in recent years mining activities have contributed to increases in dust emissions around mining regions (Bonilla & Neeti, 2013), which is further disrupting herders' daily lives and negatively affecting their livelihood strategies. Specifically increased and prolonged dust exposure:

- deteriorates available natural resources
  - affects herder and livestock health
  - dictates when and where herders can complete their daily chores (e.g. hang washing, dry foods etc.)
  - creates additional financial burdens for herder households
  - places strain on family and household relationships.
- (Cane, 2014).

*"Pasture land and air is polluted by the dust. After snow or rainfall it looks like cement. So when the animals eat that dusty grass it affects their insides and lungs. In my opinion the disorganised roads are creating the air pollution; if the roads are organised and controlled this problem can be resolved."*

Male herder, Khanbogd Soum

Herders who live close to mine sites and along transport routes are particularly affected by mining-generated dust. When the wind blows in the direction of herder camps, households are exposed to high levels of road and coal dust for ongoing periods with the dust only settling after rain or snow (Cane, 2014). People surveyed said that the effects of dust from the haulage route are experienced by families on average up to 7.3 kilometres away. However, when the winds are strong, this distance may be much further.

As with water quality and pasture availability, the impacts of dust contain specific gender dimensions. These issues affect men and women differently and to varying degrees, according to their specific roles in the household. Although the concerns of women and men differ, the relevant Environmental and Social Impact Assessments of companies only mention the issues more commonly raised by men. This is generally associated to a lack of consultation with women during the design phase of the operation.



Figure 41: Male and female herder

### 5.3.1 Nature capital

Dust generated from mining activities negatively interferes with herders' pasture and livestock as excessive dust settles on surrounding land to the detriment of the ecology and the health of the herd. The effects of dust emissions on vegetation are varied and depend on the type and extent of dust, and the type of habitat and vegetation. Therefore it is important for mining operations to determine the types of vegetation in their impact zone and understand how dust will affect surrounding pasture. While no in-depth study on the impact of mining dust on vegetation has been conducted in Mongolia, research piloted across a range of vegetation types suggests that:

- Dust reduces pasture quality due to the reduction in physiological processes essential for healthy growth.
- Dust produces physical effects and damage on plants that result in decreased plant health, or plant death.
- The cumulative impact of dust on vegetation makes it more vulnerable to severe weather conditions and droughts (Farmer 1993).

Furthermore, dust created through the degradation of pasture from truck movements and overgrazing is composed mainly of topsoil. The loss of topsoil reduces fertility, resulting in reduced pasture productivity. Natural fertility is largely dependent on the organic matter content of topsoil which is often low in arid environments due to low humus production as a result of low precipitation (FAO, 1989). Reduced productivity in Mongolia is further exacerbated by reduced rainfall due to climate change, with an annual decrease of 2 percent between 1940 and 2004. As pasture productivity decreases, so does the rate of soil formation. When soil formation rates are exceeded by rates of soil loss, desertification occurs leading to potentially higher dust incidences and reduced pasture availability.

Consequently, it is important to understand that excessive mining-generated dust may exacerbate stresses on the already fragile ecology of Mongolia and have longstanding impacts on vegetation and the herds that depend on it.

The impact of mine-related dust on herds has caused high levels of concern for herders who believe their animals are digesting dust from pasture and inhaling airborne aerosols. Herders reported that dust was found inside stomach lining, innards and lungs ('black lungs') of animals. This was particularly the case

with smaller animals (e.g. sheep and goats) as they are unable to travel long distances away from dust affected pastures. Figure 42 demonstrates the number of herder households that have observed changes in animal health due to mining dust over an eight year period.

In Tsogttsetsii, within the arid zone of the Gobi, mining activities and dust were more often attributed to changes in animal health, which correlates with the ecological specificities of the region and the higher number of mining vehicular movements in the area. In Sharyn Gol (northern Mongolia region), mining dust incidences climatic conditions were nearly equally attributed to changes in animal health. Animal sickness is both a financial cost and also causes stress and extra work to the household. Traditionally it is often a women's role to care for the sick animals. Women discussed having to water the eyes of new born animals that were infected by dust and also applying traditional herbal remedies to combat infections. However, traditional herbs were harder to find due to reduced pasture availability and quality.

Scientific evidence linking declining animal health from mining-generated dust is limited in Mongolia. Previous research conducted in another mining region in Mongolia associated animal lung diseases with mine-generated dust emissions (Sukhgerel, 2014). This was disputed by the operating mine in the area. Despite this, the widespread concerns highlight the need for further investigation into the impact of mining-induced dust on animal health across Mongolia.

While most mining companies undertake some form of air quality and dust monitoring, those operating outside international standards and regulations often have limited data sets, lack transparency and coordination. For example, in the Tavan Tolgoi area (where multiple large-scale mines operate), only one mine publically reports its dust monitoring. There is no publically available information indicating that companies are undertaking research into the health impacts of mining-generated dust. A coordinated approach is required to manage and control the cumulative impacts of dust. This may involve developing a consultative group to coordinate monitoring activities, share dust monitoring data and collectively manage dust-generating activities. Similar air quality monitoring groups are increasingly used within multi-mine regions across Australia, Canada and Colombia.

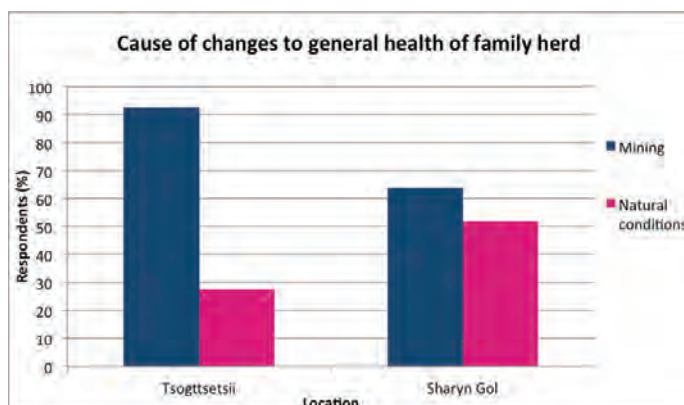


Figure 42: Increased incidence and cause of dust affecting herd health



Figure 43: Animals grazing along road and next to mine waste rock dump with dust from mining trucks passing



### 5.3.2 Physical capital

The rapid growth of many Mongolian mining regions has not coincided with the required supporting infrastructure to develop responsible mining. In areas where multiple mines operate alongside each other (cumulative impact areas) there is often limited coordination or shared use of mineral infrastructure. This, coupled with the current social convention of driving freely across pasturelands to make roads and then expanding on these as the roads become rutted, has led to large-scale degradation of land, soil erosion and contributed to ongoing dust incidences (see Box 15) (Batkishig, 2014). The loss of the topsoil layer and

structure from vehicle impacts also accelerates and exacerbates wind erosion processes. For example, in Tsogttsetsii at the peak of production in 2013, government officials advised that these roads accommodated up to 6,500 trucks each day, and contributed to the spread of dust along a wide corridor of land occupied by herders.

#### Box 15: Extent of road areas for 2003 compared to 2014

'Road impact areas' (highlighted in red) are defined as areas with three or more roads within a 2 kilometre grid cell as identified using manual satellite image interpretation of Landsat 2003 and 2014 imagery.

The maps correlate with qualitative research which tracked the growth of the Coal Road by estimating the number of trucks traversing the unpaved road per day. These include:

- in 2009, about 1,000 trucks travelled along the Coal Road per day (Cane, 2014)
- in 2011, up to 1,300 trucks travelled along the Coal Road per day (Johnston, 2011)
- in 2013, up to 6,500 trucks travelled along the Coal Road per day (government informants, 2014).

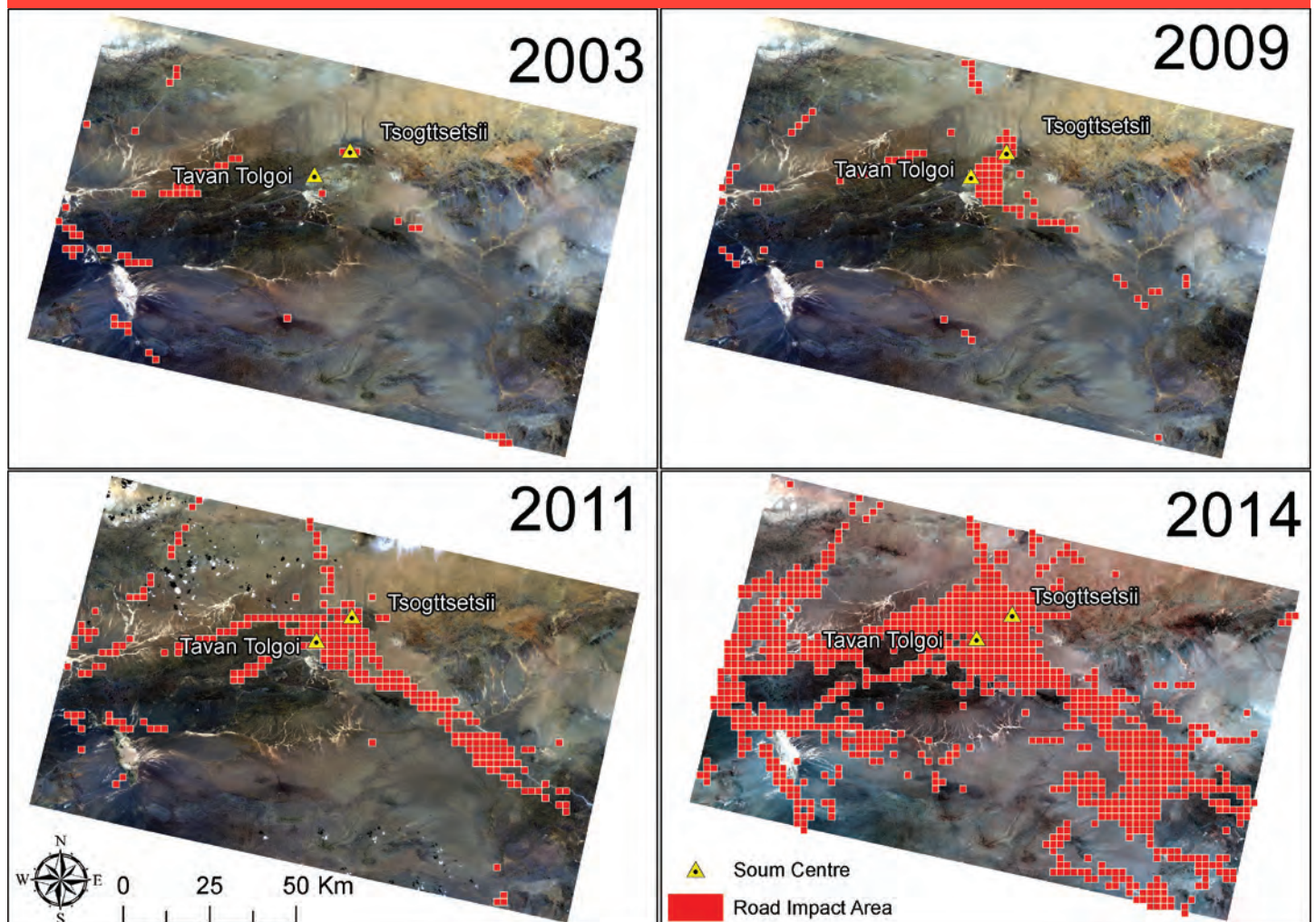




Figure 44: Animals grazing and trucks travelling next to paved road in Tsogttsetsii Soum

The limited coordination of infrastructure planning and oversight of off-road truck movements exacerbates dust emissions in many mining regions. Where formal infrastructure exists (e.g. in Tavan Tolgoi area), national government and local authorities need to work together to limit off-road movements and penalise trucks for not driving on the road. This will likely require considerable resources and building the capacity of the responsible unit. In the case where no formal infrastructure exists, collaborative infrastructure planning (including government, company and community stakeholders) should be undertaken as soon as feasible.

Excessive dust increases general maintenance around herder households and affects herders' physical capital. This includes their gers, mobile phones and other electrical equipment, motorbikes, wind generators, solar panels, tractors (in Sharyn Gol) and sometimes vans. During the research, herders reported dust inside and outside their ger, which could potentially damage their possessions and properties over time (Figure 45).

Research from Australia indicates that excessive dust can increase maintenance costs of machinery as it gets in between moving parts such as bearings and vehicle fans impellers (Australian Government, 2006). Further, dust on sensitive surfaces, such as solar panels or furnishings, may damage material over time. Dust can also reduce visibility, increasing the risk of motor vehicle accidents and damage.

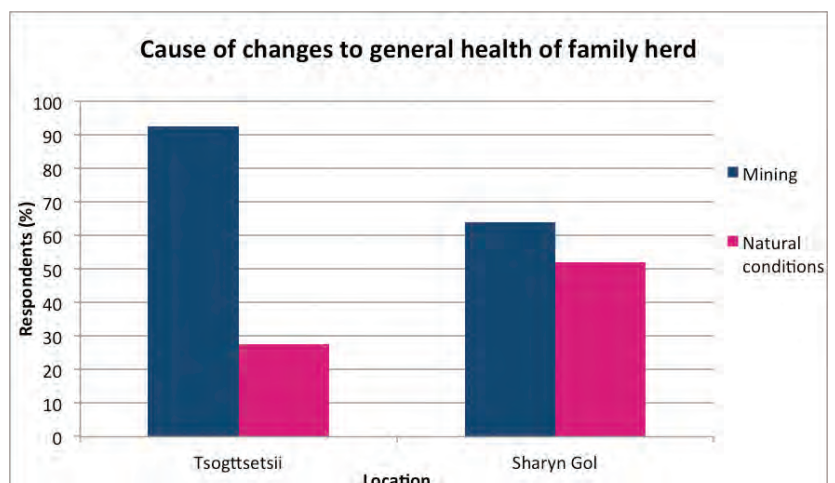


Figure 45: Increased incidences and cause of dust in and around gers and herds



### 5.3.3 Human capital

Herders reported worsening health, altered domestic routines and increased workloads due to mining dust. The research found that dust is considered to be affecting herder health, particularly children and the elderly, living within the mine impact zone and along transport routes. During the research, numerous herders reported increases in allergies, coughing and difficulties in breathing since mining commenced. These respiratory issues in mining regions are reaffirmed by local health practitioners and by some national studies. For example, the Mongolian National Human Right Commission (MNHRC) found that in 2012 the incidences of respiratory and cardiovascular disease in Tsogttsetsii had increased 2.5 times within one year (MNHRC, 2012).

*“Diseases such as respiratory tract infection, accidents and poisoning have increased lately. There is no statistical data about the professional connection for the diseases related to the increased dust since the commencement of these activities but I feel it is connected.”*

Doctor, Khanbogd Soum

Although these health issues are not yet scientifically linked to mining, herders reported that they have more health problems during peak mining periods, which suggests a correlation between mining and negative health impacts. Health issues are a concern for the entire household; however, they impact on men and women differently. For example, as men often spend more time herding livestock they are more often exposed to dust particles. Meanwhile, as it is general the responsibility of women to take care of the health of the family, women's household duties increase.

While no in-depth study relating to community health and mining dust has been undertaken in Mongolia, scientific studies from the United States link exposure to dust (especially fine and coarse particle matter) with a range of health problems. This includes coughing, irritation of the airways, aggravated asthma and chronic bronchitis. Studies have found that prolonged dust exposure can lead to reduced lung function, irregular heartbeats and heart attacks (United States Environmental Protection Agency (US EPA), 2014). An Environmental and Social Impact Assessment (ESIA) from a major mining operation in Tsogttsetsii recognised these risks and acknowledged that dust from truck

*“When we clean our clothes outside everything becomes dirty again so there is no use in cleaning things. When we clean our bed sheets and dry outside it becomes dirty. All the furniture and mirrors become very dusty everyday even though we clean it becomes dusty again.*

*It becomes too difficult to prepare meat because it becomes dusty. It affects females more as it adds to their cleaning work. In the morning we use a wet towel to clean the house and the towel gets really dirty.”*

Elderly Herder, Tsogttsetsii Soum



movements along unpaved roads poses a health hazard for local herder residents, particularly those that reside along coal transport routes (Environmental Resources Management (ERM) and Sustainability East Asia LLC, 2010). As prolonged exposure to dust can cause serious health issues, it is imperative that further research is undertaken in this area to better understand the impact of mining-dust on the health of local residents.

Since the onset of mining, both women and men reported increased domestic workloads due to dust. During active mining periods, male herders reported traveling further with their livestock to find pastureland not affected by dust and cleaning their water sources more regularly. Female herders also reported increased workloads as they needed to clean more frequently, could not prepare their meat or dry foods outside, and increasingly needed to look after sick animals.

### 5.3.4 Financial capital

The impact of mining-generated dust on the environment, human and animal health is having a cumulative detrimental affect on the financial capacity of herder households. Herders raised concerns that dust from roads and mine sites had reduced the quality of their animal products, which in turn had affected their income. For example, herders reported that dust contaminates animal meat (particularly the lungs), aaruul (dried dairy curd), and the wool and cashmere of animals, making them less saleable. Dust was also creating extra burdens and household costs for herder families. For example, herders reported:

- consuming and purchasing higher levels of petrol to graze animals further away from dust
- visiting the vet and purchasing animal medicines more frequently
- spending more time minimising the effects of dust on their surroundings (cleaning, washing wells, and caring for animals)
- spending less time generating wealth from making dairy and other commercial products
- visiting doctors and spending more on health services and medicine to minimise health problems.





Figure 46: Herders shearing animals with coal trucks in the background. Activities organised around wind direction to minimise dust occurrences

### 5.3.5 Social capital

Herders draw on a range of social networks and relations or khotails to support their livelihood activities and strategies. In mine-affected regions, dust emissions affect herder households' family dynamics and relations. It is common for Mongolian families to visit friends and relatives in the countryside for leisure or special occasions. However, many herders now consider mine regions too dusty and unsafe to visit. In some cases, herders in mining regions are sending their children away to aimag centres due to the level of dust, which places strain on families, particularly the children and mothers. In instances where families do not have such social networks (e.g. new arrivals or 'artisanal miners'), children remain in the area, which has a negative impact on their health.

*"Children used to come to the area for summer vacation, but now children can't come...little babies can't stay with the dust in the air."*

Elderly Herder, Tsogttsetsii Soum

There are also non-tangible aspects of the herder culture that are impacted by dust. Mongolian herders share a co-domestic relationship with their animals, whereby both herder and animal are dependent on each other to survive (Keay, 2006). Due to this interdependence, both people and animals share mutual interaction, engagement, respect and support in Mongolian culture (Fijn, 2011). Mistreatment of a herder's livestock (e.g. ailing animal health due to dust) is disrespectful and potentially undermines the significance of herders' heritage and cultural attributes (Cane, 2014).

Dust may appear to be a mundane matter in the context of urban life but for land-connected people who spend so much of their existence outdoors, the salience of dust pollution becomes an acute quality of life issue. Mining development must consider and implement more effective ways to mitigate the impacts of dust on local communities to gain community acceptance.



Figure 47: Herder children who remain in dust affected areas experience negative impacts on their health

# **s6** Resettlement and displacement





## 6 Resettlement and displacement

During the socialist period, the development of mine and associated infrastructure was planned and managed by the central government. Resettlement, on the other hand, was managed locally by herder cooperatives and local governments. Following the socialist transition, Mongolia embraced democratic and human rights principles. For the first time, Mongolians were able to privatise land and foreign companies were able to secure rights to develop large-scale mines. However, resettlement has not been managed well. Resettlement Action Plans (RAPs) were not commonplace until international finance institutions insisted on a higher standard of performance.

### Resettlement and Compliance:

Some resettlement cases have received international attention, including at the giant Oyu Tolgoi mine. Local community groups brought their concerns to the International Finance Corporation's Compliance Adviser Ombudsman office for a full investigation. Likewise, the national NGO 'OT Watch' has called attention to UHG's failure to identify all displaced households and provide adequate compensation for loss of or access to assets (Sukhgerel, 2014).

In the last 15 years, displacement and resettlement of herders has increased due to:

- growth of the mining industry and pressure on land availability
- road, rail and other infrastructure development
- replanning and rebuilding the nation's capital, Ulaanbaatar.

The growth of the industry, especially the increase of new projects on undeveloped, has induced displacement and resettlement where mining areas overlap with land and pasture inhabited and used by herders.

Resettlement relates to situations where people move or are moved from one place to another. It can be both planned and unplanned and can include 'physical displacement' and 'economic displacement' (see Table 1: Types of displacement). Some herders are forced to move without assistance or compensation because to stay would lead to loss of livelihood and impoverishment. This has occurred at both Tavan Tolgoi and Sharyn Gol. Other types of displacement includes disruption to social networks, cultural protocols, traditions and rituals. These impacts are significant yet intangible; and therefore not well accounted for in planned resettlement processes.



Figure 48: Camel herd next to a mine quarry



Table 1: Types of displacement

Type	Definition	Challenges
Physical displacement	Physical displacement relates to the locational aspects of resettlement and loss of place-based assets. It tends to be focused on tangible assets; that is, physical assets that can be valued, compensated and/or replaced. For example, if herders lose land, livestock or other assets, they should receive compensation to ensure that they can acquire equivalent assets elsewhere.	Challenges occur when assets, such as communal or shared resources, are not compensated for or replaced. Competition over land can also see some herders pushed out, rather than assisted.
Economic displacement	<p>Economic displacement can occur without physical relocation. It can occur where people's mobility is reduced, common resources are diminished, or livelihoods are affected, even though living arrangements have not changed. For example people may:</p> <ul style="list-style-type: none"> <li>• not be able to travel to market</li> <li>• have to travel further in order to feed or water their herd</li> <li>• delay plans to expand businesses due to uncertainty associated with a potential relocation.</li> </ul>	Economic displacement is not as well recognised as physical displacement, but it can have significant effects.

## 6.1 Key regulatory aspects

There are a number international standards and safeguards that outline minimum performance standards for resettlement, such as:

- World Bank's *Operational Policy on Involuntary Resettlement* (OP 4.12), 2001
- International Finance Corporation's (IFC) *Performance Standard 5: Land Acquisition and Involuntary Resettlement*, 2012
- European Bank for Reconstruction and Development's *Social and Environmental Policy and Performance Requirements on Land Acquisition, Involuntary Resettlement and Economic Displacement*, 2008
- Asian Development Bank's *Safeguard Policy Statement on Involuntary Resettlement*, 2009.

Most multilateral banks, international donors and major companies subscribe to these standards. For example, the policy frameworks of many of the major operations in Mongolia, including Oyu Tolgoi, UHG and Tayan Nuur align with these standards. The standards are also reflected in an increasing number of legal frameworks in the international arena. However, these standards apply to all sectors and do not account for some of the unique characteristics of the mining industry. To ensure that mining's impacts are adequately accounted for, companies

and governments must think carefully about how best to safeguard herder livelihoods where resettlement is required to make way for a mining project and its associated infrastructure.

In Mongolia, there are no laws or regulations that recognise and protect herders' customary grazing rights and practices on common pastureland (Tumenbayar, 2002). Instead, customary rights are practised as a set of social norms relating to the allocation of pastures to households and the regulation of behaviour within and between groups (PALD, 1993). Under the Constitution of Mongolia (1992), all Mongolian citizens (including herders) are able to privatise and register a plot of land with the local government if they build a settlement on a parcel of land (e.g. a winter or spring shelter for their livestock). Legislation enables men and women to own land; however, registration is usually in the man's name (Daley et al., 2013). Formal registration secures the right to use the land for 30 years, with a 30 year renewal option. Unregistered pastureland, including land around privatised plots, continues to be recognised as common land (Tumendemberal and Goodijk, 2011).

*"We were told that in 2016 our village will be resettled because our village is included in the extracting area of Tavan Tolgoi mine so it is considered as the government owned land... But there wasn't any official community meeting regarding this. We don't have any information about this. The mining operation is getting closer to our town. Maybe it is financially beneficial to dump close to their mine...We have discussed about this in the community meetings, but they say it's decided by the government... Some herders met the Tavan Tolgoi official, but they responded that 'it's the government owned company, we have the right, and government knows what they're doing'"*

Elderly couple, originally from Tavan Tolgoi area

There is also no legislation relating to resettlement of whole communities situated in proximity to mine sites. This is relevant for mines that expand their footprint or have significant effects on local communities. The giant Tavan Tolgoi coal mine in Umnugovi Aimag and Khushuut coal mine in Khovd Aimag are facing this challenge. Others may face the same or similar challenge in the future.

The Mongolian state requires that developers consult with land owners and users during the Environmental Impact Assessment (EIA) process. This provides an opportunity for herders to raise issues that relate to impacts to pastureland. However, Mongolia's current land tenure system has a number of issues. In instances where compensation for impacts on pastureland is sought, companies will usually require a legal document outlining a herder's formally recognised right to land. With pastureland designated as 'common use', herders will never be able to provide such documentation. Similarly, herders will be unable to produce title documentation if they have not privatised the land on which they have built a settlement. Widespread absence of formal title means that rights to land are not always recognised or compensated by developers.

In 2013, as part of reforming its land laws, the Government of Mongolia (with assistance from Asian Development Bank) drafted a Law on Compulsory Land Acquisition. Human rights organizations criticised the law as it allowed land to be taken away by the government and did not consider livelihood security of resettled people. The parliament has since returned the law to the government for modification.

## 6.2 Gender, displacement and herder livelihoods

There may be an assumption that because Mongolia is a semi-nomadic society, people are adept at moving around and are likely to cope with the adverse impacts of resettlement. The fact is, however, that while mobility is a key feature of life as a herder, people nonetheless follow distinct patterns of movement and are deeply attached to the land that they access at different times of the year. That Mongolian herders are mobile and will be less affected by resettlement is a myth.

Research shows that displacement and resettlement are deeply disruptive for mine-affected people, whether they agree to relocate voluntarily or not. Responsible companies aim to avoid resettling local populations. If there is no option but to resettle local people, responsible companies will compensate fairly and

work to restore the livelihoods of resettled people and improve their standard of living. However, the challenges associated with achieving livelihood improvement in a resettlement scenario are significant, and usually underestimated by all involved.

One aspect that is often underestimated is resettlement's differential effects on women and men. Women can experience the direct and indirect consequences of mining in different, and often more pronounced, ways than men. There is often limited attention paid to gender analysis in planning for mining operations, including resettlement. Research also confirms that it is often more difficult for women to access the economic benefits that mining can bring, in the form of jobs and business opportunities (Thukral, 1996).

### 6.2.1 Natural capital

There are some positive outcomes on natural capital from resettlement. For example, some resettlement packages include extra livestock and 'good breeding livestock' that people may not have been able to afford previously. Others resettlement packages may improve access to water through the installation of hand pumps (although this positive impact can be neutralised if people are unable to afford fuel to run the pump). Other resettled herders are provided with replacement land of equivalent quality, and have some involvement in the choice of location.

*"Because of the dust, the quality of grazing land is deprived and there is garbage around. Most of my herding neighbours moved out because of the grassland quality, garbage, waste, noise and mining traffic. Everyone escaped to look for better pastureland."*

Herder living along the Coal Road, Tsogttsetsii Soum

During the research, there were numerous reports of negative impacts on natural capital from the effects of displacement. Competing land use (e.g. mining and cash cropping) can push herders off land due to lack of space (see Figure 34: Competing land uses in Sharyn Gol Soum). Families who remain tend to have smaller herds. It is also the case that fences are erected to mark lease boundaries and decrease the amount of grazing land

available to herders, which can have devastating effects. In other cases, artisanal miners are displaced by other powerful interests, including large-scale mining. Formal infrastructure, such as paved roads built across grazing land, reduces available land. Some vehicles continue to drive next to the road on remaining grazing land, exacerbating the effects of displacement. Increased dust affects the quality of grazing land, and herders say that they are forced to move simply to avoid impoverishment or maintain their livelihoods.

*"Even if my family wanted to move, there is no place to go as most of the land in the soum is already owned by companies. If we move to another area companies would come and say they already own the land... there is no use in saying I was born and raised here."*

Elderly herder, Tsogttsetsii Soum

Some families said that they want to move away from the impact zone, but do not have resources to do so. Many families indicated that finding new land was hard as available pasture is already used by other families. If families are re-settled or displaced, livestock find it difficult to graze on new lands as they don't know the land or where the water sources are.

### 6.2.2 Physical capital

Physical capital has been negatively and positively impacted by displacement and resettlement by mining. People interviewed noted two positive impacts. Firstly, in some cases, resettlement packages will include new physical infrastructure, such as water well or a winter shelter. Secondly, some companies assist herders to acquire loans, which some have used to build or acquire infrastructure and equipment (e.g. greenhouses).

However, there were many more negative impacts on physical capital. Some families reported that because of limited land availability, they now stay in their winter shelter all year round, limiting their mobility. Many families do not want to be resettled because they have invested in winter shelters, which are

expensive. Re-establishing a winter shelter also requires time to accumulate a dry manure floor to hold heat during winter. The quality of a winter shelter is crucial for herders to maintain wellbeing of livestock during winter. Relocation or erection of new shelter affects the wellbeing of the household and livestock.

The other major impact is that physical capital is not always replaced upon relocation. One family had a shower facility and when they were resettled the company said they would help rebuild it, but three years later they are still waiting. Herders said that forming a written agreement with the developer would enable them to hold the company to account for what they promised.



Figure 49: A resettled winter camp along the Coal Road, Tsogttsetsii Soum



### 6.2.3 Human capital

While resettlement packages can include support for jobs and scholarships for children, training for herders displaced by mining (e.g. to grow vegetables and build fences), there are also issues. In some instances, inconsistency between sites and the compensation package itself has been contested. For example, in the South Gobi, Oyu Tolgoi (OT) recognised that mining has economically displaced some herders. OT has committed to a compensation arrangement guaranteeing that one person in each herder household will be hired or financially compensated (through a salary equivalent). Compensation arrangements at neighbouring mine operations do not extend to economic displacement of herder livelihoods.

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*“Companies have promised the locals to help them to pay for the university fees of their children, and help with air transportation if they’re sick. They did help the families to move and build a new fence, but that new place was included in the territory of the Erdenes Tavan Tolgoi mine. As a result, both companies didn’t take any measures about those families and haven’t done anything for them. So those families became the victims.”*

Herder, Tsogttsetsii Soum

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The research considered the gender implications of the transition of herders into mine-based employment, including as part of a resettlement package. Historically in rural Mongolia, men remained with the herd, while women sought non-agricultural work. It is common to see men move into the mining industry while women remain with the herd. In these situations, women said that they tend to herd alone or with a relative. In interviews, women herders explained that their workloads increased and personal safety concerns arose. Another common scenario is for a family to sell or rent their herd and move into a soum centre. When this occurs, women become homemakers and dependent on the partner’s income. This can lead to a loss of independence, social networks and traditional knowledge. Increases in alcoholism, family breakdown and domestic violence can be exacerbated (Cane, 2014). Discussions with wives of herders suggested that these arrangements often have negative implications for women and household relations. Some herders reported that their health was negatively affected through the stress of resettlement. Others report health effects of living in the high impact zone, but not being resettled.

### 6.2.4 Financial capital

Displacement and resettlement has negatively impacted upon herders’ potential financial capital base in a range of ways. This includes cases where resettled herders are provided with compensation from companies. Compensation packages vary for each family and can include a cash payment along with other support (e.g. potentially scholarships, employment, support to move and rebuild shelters or acquire bank loans). Satisfaction with the compensation packages varies. Some are yet to receive what they consider to be adequate compensation to assist them to resettle. Other families are not in the direct impact zone, so do not receive support for resettlement. Several herders had complained to the government about dust, but the government only suggests that they leave the area and that they are given basic compensation (i.e. without assessment of loss or application of minimum compensation criteria). Overall, there is a lack of information about resettlement. As a result, some families said they had stopped growing their business because they were unable to plan for the future.

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*“We are yet to receive adequate compensation to assist us with moving...A company representative used to visit us, but recently they stopped...They ask us ‘how we are doing and how’s life?’ And they helped us to pay for one year scholarship for our son’s university fee...We are unsure why they stopped paying the scholarship. Maybe because they told us that we are not in the non-direct impact zone.”*

Woman herder, living 5-7 km from large-scale mine in Tsogttsetsii Soum

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### 6.2.5 Social capital

There were limited positive social impacts recorded during the data collection for mining and resettlement. Mostly negative impacts were recorded. For example, herders who resettled to new areas experienced tensions with herders who were already living in those areas. In some cases, resettlement exacerbated competition for grazing land, representing competition over natural capital. In other cases, competition for water resources (e.g. using water wells) in turn placed pressure on social capital.

Mongolia is historically a Shamanist/Buddhist religion where land and water hold significant spiritual value. Herders often have a deep connection with their land, or *nutag* (Cane, 2014)<sup>8</sup>. Many herder households and their herds have used the same migration pattern and winter encampments for generations. Spiritual and emotive connection to 'place' is particularly strong amongst these herding families. These patterns reflect the rich history of social networks and protocols that have helped to sustain herding families and their livestock in the harshest conditions. When families lose access to summer or winter pasture lands, they also lose a significant intangible aspect of their culture and heritage.

*"Men become miners, women become housewives."*

Former herder, Tsogtsetsii Soum

Some resettled herders believe that compensation packages fail to take into account people's history in the area and their previous hard work and investments. Others say that the government and the company haven't spoken to them and that their issues relating to resettlement are unresolved, putting pressure on family life. Likewise, several families indicated that

they had lost contact with families that had moved away or had been resettled, weakening social networks. Loss of social capital can affect herder interest in and commitment to herder groups and/or cooperatives. Finally, several families said that herder culture had been weakened by the extent of displacement from mining. Some herder households had resettled in nearby towns and were transitioning to waged work.

The cumulative effect of these impacts has led some herders in the South Gobi to change their livelihood patterns in order to survive. The research identified a vulnerable group of herders who can no longer live in a traditional *ger* as a family unit and sustain their livelihoods. These households now herd out of cars and vans, moving throughout the day with their animals to find pasture and water and avoid dust. This form of herding involves relocating children to the soum centre to live with extended family. Possessions and other assets are also left behind. The husband and wife travel daily, watching the herd, sleeping, cooking, cleaning and washing from their van. It was clear from interviews that herders were vulnerable and stressed by their situation. It also became clear that this situation often represents a final point of departure before full involuntary economic displacement.

Mining continues to occur as herders are under pressure from pasture degradation, water scarcity and climate variations. Accordingly, mining and resettlement has become an existential challenge to affected herders and it warrants close attention by regulators and civil society groups, and commitment from developers to adhere to minimum standards.



Figure 50: Herders who permanently live in their van

<sup>8</sup> *Nutag* refers to the actual place a person is born, or land of significance given to them from a family elder. A person's *nutag* holds both an affective and moral obligation to guard the land.

## Box 16: International Case Study

### Newmont Ghana, Ahafo South Project (Africa)

In 2015, Newmont released a 'completion audit report' of the Ahafo South Project Phase One resettlement. The audit was undertaken by Mr Robert Barclay and Ms Tasneem Salam to fulfil loan conditions between the company and the International Finance Corporation.

Resettlement and compensation activities for Ahafo South commenced in 2005. A total of 823 households (5185 people) were physically displaced and another 878 experienced economic displacement. In its resettlement action plan (RAP) Newmont committed to a Sustainable Livelihoods Approach, one of the first mines in the world to do so.

From 2005 and as part of its loan commitments, Newmont Ghana has facilitated a number of independent social and resettlement compliance monitoring reviews and socio-economic monitoring surveys. The RAP baseline study was conducted in 2004. All of these reports are publicly available.

On most measures, the completion audit confirms that for the majority of the resettled population, livelihood restoration is deemed to have been achieved. By international standards, the auditors suggest that this is perhaps the best resettlement program yet undertaken in Africa.

Results are not as favourable for about a quarter of the resettled population. One of the main reasons that people have not been able to restore their livelihoods is failure to secure replacement land, for one reason or another. The report recommends that the company seek to better understand the dynamics around this outcome. The report also provides a number of 'suggestions for the future', including in relation to better understanding opportunity costs, dependency avoidance and ongoing monitoring.

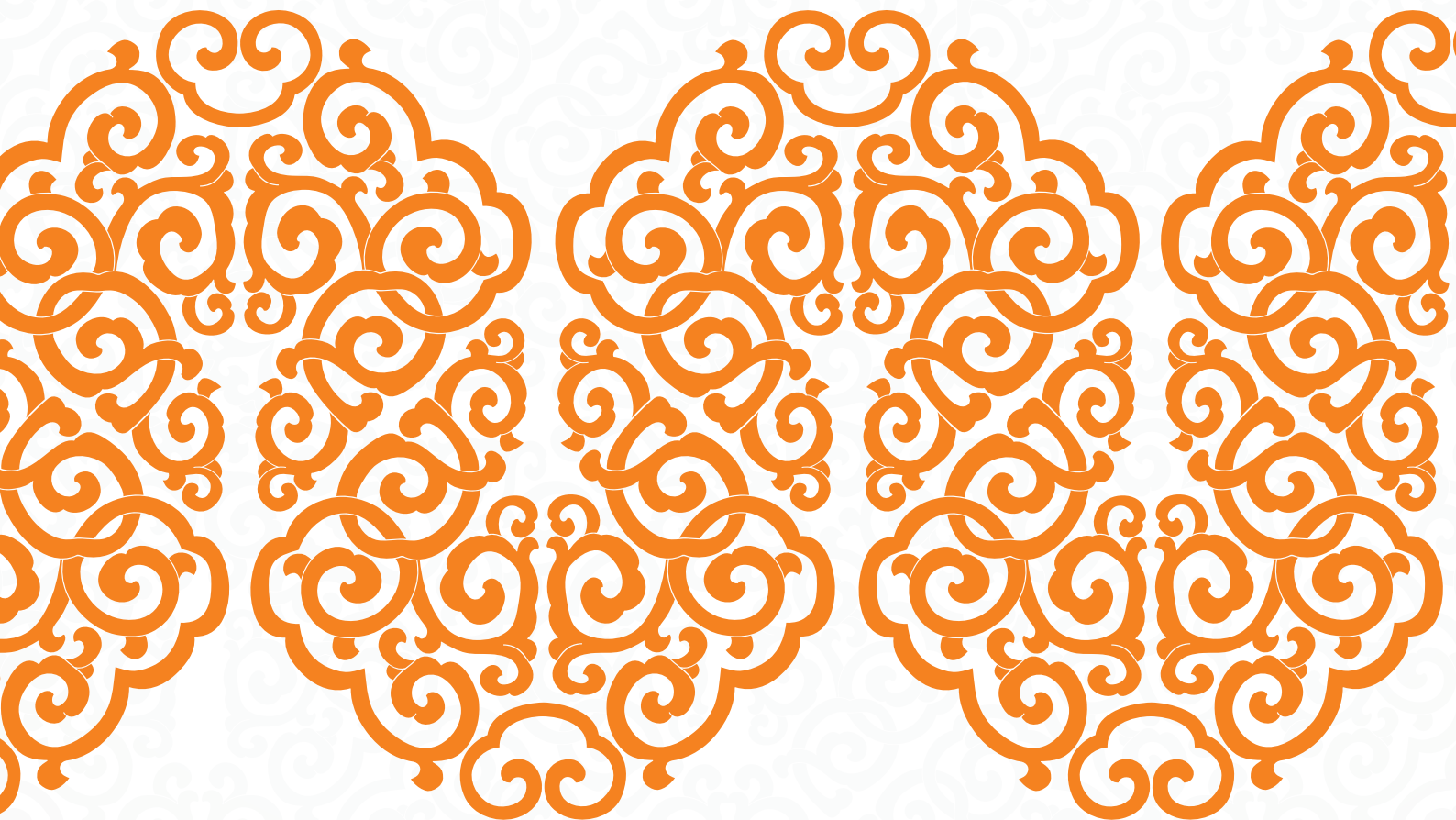
For those interested in livelihood restoration activities, the report contains information about a range of programs that Newmont Ghana has in place, including:

- Vulnerable Peoples Program – a tailored program for households assessed as 'food insecure' in the critical 3 years following physical displacement.
- Livelihood Enhancement and Community Empowerment Program (LEEP)
- Agricultural Improvement and Land Access Program (AILAP)
- Ahafo Agribusiness Growth Initiative (AAGI)
- Ahafo Linkages program
- a series of programs targeting women.

For more information, visit the project website: <http://www.newmont.com/operations-and-projects/africa/ahafo-ghana/overview/default.aspx>



# **S7** Artisanal and small-scale mining



## 7 Artisanal and small-scale mining

As pressure to generate income increases, large numbers of rural residents in developing countries have taken up what is collectively called artisanal and small-scale mining (ASM). ASM often builds on traditional mining practices, which may have been culturally managed for generations. However, growing pressure to earn money and enter the market economy often lead to a 'rush' to extract – with major environmental and social consequences. Mongolia presents a remarkable case because of the extraordinary speed of the onset of the gold rush, the scale of livelihood transitions and their implications for the herding communities.

Since 1995, gold mining has emerged as one of the most dynamic sectors of the Mongolian economy and is the current focus of many international mining companies operating in Mongolia and the ASM sector. Currently 94 percent of the mines in Mongolia are gold producers (World Health Organisation, cited in Lahiri-Dutt, 2010). In 2003, there were at least 100,000 artisanal miners (Greyson et al, 2004). In 2013, it was estimated that numbers could be between 40,000 and 60,000 (Buxton, 2013b); however, it is useful to remember that many other gold traders, shopkeepers and restaurant owners are involved in the ASM economy.

ASM workers are usually under-employed rural people, low-paid civil servants or herders who have lost income due to *dzuds*. ASM is often labelled as a poverty-driven activity as it is driven by a lack of financial capital to sustain a livelihood, rather than purely by greed. Others refute this popular notion, suggesting

instead that artisanal mining is linked to Mongolian ideas about patriarchy, generosity and specifically the obligation to share wealth (High, 2008). In any case, while ASM has tremendous potential for to reduce poverty; it also negatively impacts on the surrounding environment (Labonne, 2002).

In the Mongolian context, it is important to understand the difference between informal artisanal miners and formal small-scale miners. Often people cluster these mining types together under the heading 'ninja miners'. While there are parallels between the two, in terms of machinery used and the close proximity in which they operate to each other, artisanal mining and small-scale mining are often linked to different economic drivers and regulated by different legal obligations. There are also distinct social, environmental and economic impacts attributed to each type of mining (see 9.1 Appendix A: Types of mining). Small-scale miners are often granted licences, giving them permission to extract the ore body and requiring them to pay rehabilitation tax to recover the used land. Artisanal miners, on the other hand, either operate illegally or in partnerships (formalised and un-formalised) and organised co-operatives (the latter pay taxes and are regulated). This handbook distinguishes (as much as possible) between these two types of mining. However, more research needs to be conducted throughout Mongolia to observe broader trends. When describing broader trends, the term ASM will be used.



Figure 51: Artisanal mining washing point

## 7.1 Key regulatory aspect

At the beginning of the rush, the Mongolian state initially ignored ASM, or attempted to manage it locally. Legislative efforts were eventually initiated in 2004, primarily to regulate and formalise ASM and to control the commodity supply chains. Since 2010, the ASM legal framework was enacted through amendments to the Minerals Law, Land Law and Personal Income Tax Law. An important section of the law was regulation 308 which formalised ASM. Further improvements to the ASM regulatory framework were enabled through amendments to the Minerals Law in 2014. Official trading of ASM gold was approved by law in 2014 marking a significant contribution to the National Treasury, rising from a meagre 3.2kg in 2013 to 3.2 tons in 2014. The minerals policy approved by parliament in 2014 recognised ASM within the minerals sector and underlined Mongolia's commitment to develop and regulate the sector. The Sustainable Artisanal Mining (SAM) project has promoted human rights-based approach to build partnerships to raise awareness of

both miners and local authorities on their rights and obligations (UNEP, 2012). Irrespective of the changes to the Minerals Law, it remains uncertain to what extent the government will formalise the sector by implementing the legal frameworks.

ASM is not easy to define as it includes a wide range of informal, artisanal and small-scale modes of mineral extraction, capitalisation and labour organisations. ASM also includes differences in scale, demographics and seasonality; the nature, type and physical attributes of extracted minerals; and the specific history of the local, national and regional context under consideration. However, there are some common factors. ASM operations typically exploit marginal or small deposits, lack capital and are labour intensive, have poor access to markets and support services, low standards of health and safety, and have a significant collective impact on the environment (MMSD, 2002).

## 7.2 Gender, ASM and herder livelihoods

Artisanal miners exist in a contentious but often symbiotic relationship with herders and small or large-scale mines. The need to survive and build a livelihood is such that many of the poor in developing countries like Mongolia choose to take up ASM to supplement meagre cash-based incomes. At the same time, ASM can have detrimental effects on the natural, environmental, social and economic systems of the local regions impacting on herder livelihoods (Heemskerk, 2005; Sinding, K, 2005).

The primary impacts of ASM on herder livelihoods arise from a reduced access to pasture. This leads to a loss of productive assets, such as livestock. Conflicts over land and local resources often force herder communities to move away from their traditional lands, while those left behind suffer from various physical ailments caused by a rapidly degrading environment. Research suggests that former herders with inadequate incomes also supplement incomes with artisanal mining.

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*"Both women and men do ASM. Mostly the husband and wife work in families, because for both men and women it is hard to find a job. Especially for women, it's hard to find a job in the large mine. There are not many job vacancies for women there..."*

Herder and ex-miner, Sharyn Gol Soum

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ASM is a highly gendered activity, reflecting the fact that, like elsewhere in the world, women and men play different roles in mining (Perks, 2011; Lahiri-Dutt 2008; Moretti 2005). On an average, about 71 percent of artisanal miners are male and 29 percent female (SDC, 2013). The key factors in determining gender roles and status of women in ASM include access to and control of resources. This includes their ability to attain knowledge of resources, their decision-making capacity or political power; and beliefs or attitudes that support or impede the transformation of gender roles (Hinton et al, 2003).



### 7.2.1 Natural Capital

Despite being undertaken on a small scale and with rudimentary technology, artisanal mining leads to environmental degradation (Jennings, 1999). ASM is dependent on the availability of minerals, a process which requires plenty of water to separate the metal from the ore. In Mongolian dryland steppe, water is a precious resource and its extensive use by artisanal miners pollutes the water in rivers and streams, deepening the water problem for the communities who live along the water source further downstream (see Section 3: Water resources) (Figure 30).



Figure 52: Herding family living near artisanal mining washing point

Artisanal miners are often in conflict with the traditional land users because mining encroaches upon the rights of the herders to pasture. The herders have no legal protection from the damages to (or loss of) their pasture lands or watering sources. Therefore, herder livelihoods become more vulnerable. Pasture degradation is a considerable impact from poorly managed ASM throughout Mongolia. The Sustainable Artisanal Mining (SAM) Project has previously initiated plans for the planting of tree sapling and berry bushes with artisanal miners for ecological restoration of degraded landscapes.

While informal artisanal mining has contributed to significant loss of pasture (as is witnessed in the Zamaar Valley), this research found that there is often a misunderstanding regarding the source of this pasture degradation. The significant loss of pasture experienced by the community in Sharyn Gol Soum has been caused by small-scale mining and not artisanal mining; however it is often the artisanal miners that receive the blame. This results in loss of livelihood as the artisanal miners are forced to move out of areas.

*"All people blame the ninjas [for what they are doing], but it is actually the gold mining companies, who are not doing the rehabilitation properly. I think the local government together with the central government should take measures on this ..."*

Herder, Sharyn Gol Soum

The research verified accounts from local herders through GIS mapping the different land uses in Sharyn Gol soum. (See Box 17: Land degradation associated to particular mining types in Sharyn Gol Soum) There are three separate types of mining (shaded in different colours) in the area, including the large-scale coal mine, small-scale gold mine and the artisanal gold mining. The

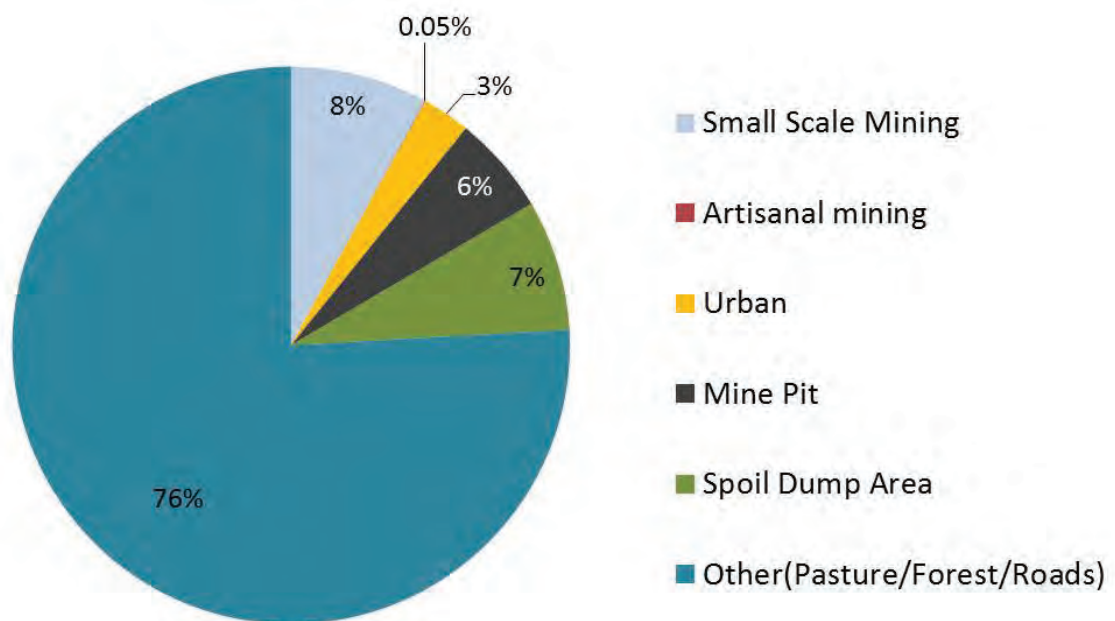
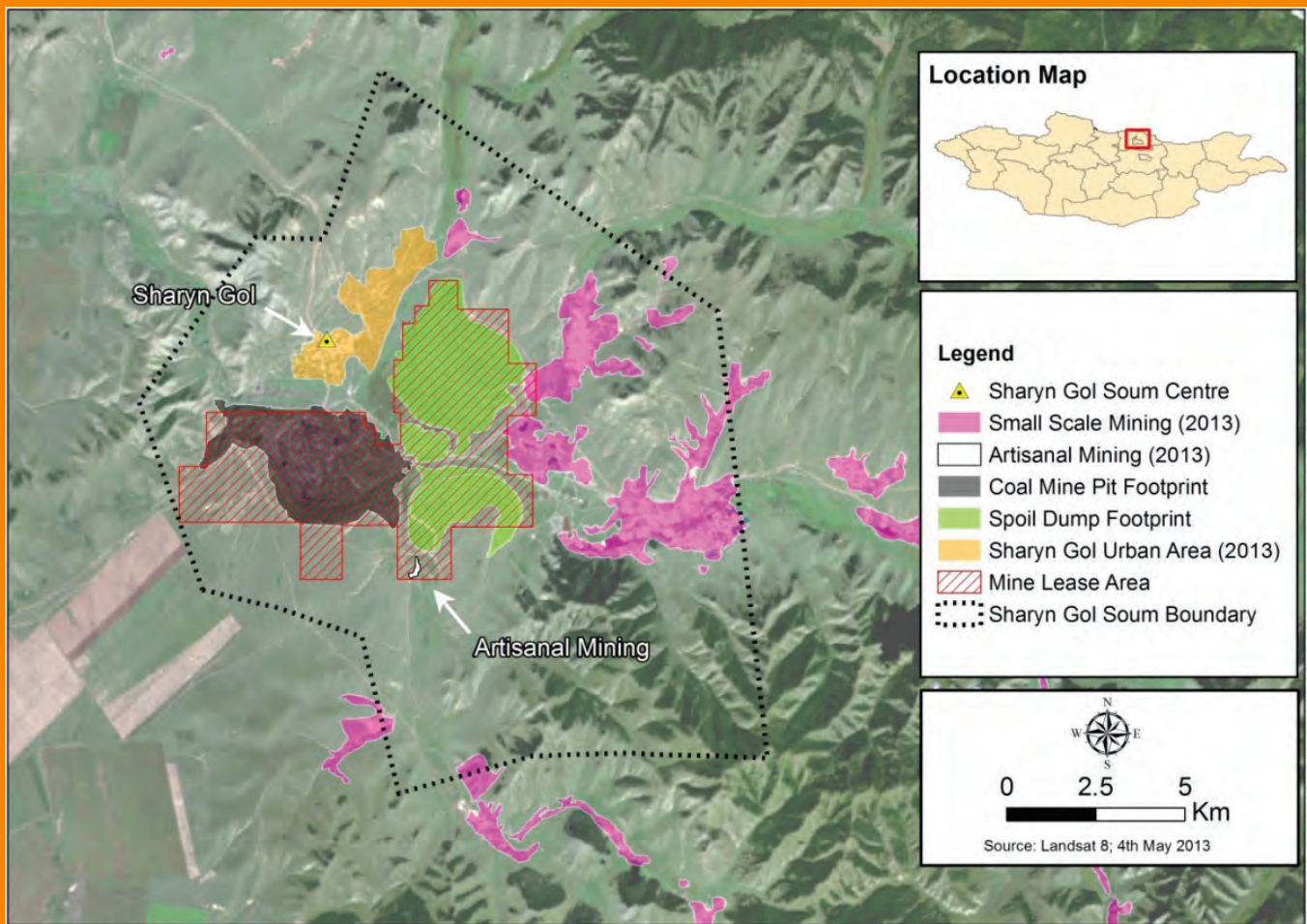
pie chart provides the percentage of area currently used by the different types of mining in the soum area. We see that artisanal mining consists of only .05 percent of the degraded pasture area and 8 percent of the soum territory is attributed to small-scale mining. Evidence also suggests that often artisanal miners begin extraction in an area and are then moved on by people of authority who then begin small-scale mining. More research is required as to the history and land uses that are contributing to pasture degradation for herders.

Further information regarding the source of environmental damage in Mongolia has significant consequences regarding how to manage land use (and indeed water) to protect and rehabilitate herder pasture. There was considerable dialogue in the community regarding the non-transparent methods used to gain small-scale mine leases. Likewise a perception that people in government held immense power whereas the herders had very little ability to voice concerns was common.



Figure 53: Artisanal mining site in Sharyn Gol Soum in May 2014 (top) and July 2014 (bottom)

Box 17: Land degradation associated to particular mining types in Sharyn Gol Soum.





### 7.2.2 Physical Capital

All types of artisanal and small-scale mining in Mongolia create large holes in the ground when exploring and extracting the ore. This is a particular concern for herders as pasture is degraded and animals are trapped and die in these holes. Herders were also concerned for their physical capital as a sudden influx of ASM has at time increased loss of property.

*"There aren't many tensions between the artisanal miners and herders in the area except the holes. These are the main reason of tension because the herders lose their horses into these holes dug by the miners."*

Mongolian miner

The physical infrastructure of ASM is largely poor quality and creates a significant risk to the health of artisanal miners (Dierkes and Khushrushahi. 2006). Mining gold using ASM methods is intrinsically unsafe, leading to accidents and sometimes death. This not only causes significant injury to artisanal miners, but also adds a burden to accompanying public services if not managed responsibly. NGO partnerships with artisanal miners tend to focus on capacity-building and training in safety rather than physical infrastructure and sophisticated equipment for production (SDC, 2013). Occupational health and safety issues of artisanal miners are becoming more visible, and there is evidence that formalising ASM is increasing investment in physical infrastructure that improves safety and productivity.



Figure 54: Equipment for washing gold

### 7.2.3 Human Capital

The human capital required to conduct ASM ranges from extremely technical to very basic styles of panning. For this reason, artisanal mining attracts many different forms of transient and fulltime labourers including men, women and young people. Miners and neighbouring herders are required to be flexible and adapt to their immediate and often high-risk working environments. ASM has both positive and negative impacts on human capital, particularly the health of the local herder communities, as well as on the miners themselves.

The health impacts of artisanal mining are often negative and are often experienced by the poorest elements of society. Poor living standards, close working and living situations and hazards in the workplace (due a lack of protective equipment) all contribute to the negative health impacts. Many artisanal miners also experience tuberculosis, urinary tract infections and STDs. However, the major risk comes from the health consequences of dust exposure, exposure to noise and vibrations caused by machines and inappropriate equipment, the inadequacy and poor nature of ventilation in workspaces (characterised by heat, humidity and lack of oxygen).

Although these health risks impact on all community members (men, women and children); women miners and women in local herder communities can be more vulnerable to the ill

impacts on their health. One example is the unique effects of chemical exposure on women during pregnancy, childbirth and childrearing (MMSD, 2002). Mercury is an effective but harmful method used in ASM to extract the gold from the ore. It causes considerable water and soil pollution; and exposure to mercury causes health hazards for humans and animals. Although mercury is not known to be used in Sharyn Gol, it is used widely across Mongolia.

Research indicates the gender division of labour at home also shapes female participation in ASM (The Asia Foundation, 2013). Most household duties and child care are perceived to be the primary responsibility of women, and women spend more daily hours on these tasks than men. Men are most often considered to be the main breadwinners, but both men and women manage the household income jointly. Women often make decisions on daily purchases while men make decisions regarding larger purchases (e.g. motorbikes etc.).

Women ASM miners work, on an average, fewer days per week and fewer hours per day than men. Activities at ASM sites are subject to a gender-based division of labour, which is primarily based on (perceived) differences in physical strength and exposure to risk. The divide of mining activities along gender lines is not strict though, and both women and men perform



virtually all tasks. Men do all jobs related to actual mining, such as digging, hauling up ore, blasting, crushing stones and loading and transporting ore. They are less present at processing and play a relatively minimal role in the delivery of auxiliary services. Women dominate processing (panning, preparing the processing plant) and the provision of auxiliary services (cooking, cleaning, buying gold), but they also perform mining activities such as hauling up ore with the windlass, sorting stones/tailings, and bagging ore. This general gender division of labour reflected both the actual performance of tasks and perceived appropriateness of tasks for either women or men.

A concerning issue has been the degree of child labour in ASM activities across Mongolia. Children accompany their parents in search of gold deposits, and often work in extremely unsafe and harsh conditions to supply additional labour. Although child labour is a problem for both genders, evidence suggests that girls are paid in kind (mainly with food) while older male children are paid in cash, revealing that gender disparities in pay begin early on in life. For all age groups, wages are lower for girls than for boys. In the case of gold and fluorspar mining, the boys represent over 80 percent of the total child workforce (Purevjav, 2011; MEK Co. Ltd et al. 2005).



Figure 55: Panning for gold

#### 7.2.4 Financial Capital

Due to the transient nature of artisanal mining individuals often have a broad-base of income sources, including artisanal mining, pension/allowances, salary, livestock husbandry, small and medium size enterprises, and family business (SDC, 2013). They switch between herding and ASM, often intending to invest their additional incomes in acquiring new livestock.

Of the various financial capitals artisanal mining was the most important source of income, followed by child allowances and salaries. The majority of artisanal miners (about 64 percent) consider that income from artisanal mining to be 20 times higher than other sources of income. In some instances, students from the urban areas have started to take up artisanal mining during their summer breaks to pay for tuition and rising living expenses in Ulaanbaatar. These younger people arrive at the gold fields along with their parents to earn extra cash to help pay cost of their education.

##### Spending pattern of ASM incomes

The miners say that they spend their incomes on living costs and school fees for children. In Sharyn Gol, a miner said that it is very hard for them to find an income that is adequate for their family's survival needs and to send their children to school.

The research demonstrated that ASM provides both individual income and also broader economic benefits for the wider community. The survey team met with an elderly woman who has transitioned from being a herder to an artisanal miner and is now primarily engaged in making traditional clothes for women in a small business operation. Her sewing business was made possible by the somewhat improved incomes in the community from ASM and large-scale mining. In this example, we see that the woman had once been a herder and had used money made by ASM to build a business and her business was partially able to survive by the heightened economic activity caused by mining.

### 7.2.5 Social Capital

One positive social capital outcome of ASM is the solidarity in the sector, particularly when herders move into ASM livelihood streams. Artisanal miners find themselves in conflict with small or large-scale mining companies, the government and traditional herders. Their contribution to environmental degradation and their undetermined legal status are important factors for this conflict.

*The locals have good incomes from ASM and from their mining jobs, so they buy more clothes...For me the sewing work is profitable here. I make clothes taking personal orders; I don't sell them in shops. I work day and night.'*

Ex-herder and ASM miner who now operates a sewing business

Artisanal miners are also in conflict with the police who move them from one site to another and as soon as a major gold bearing deposit is found. This is evident from an interview with a group of three miners who insisted that the most difficult thing for them was to deal with the police. To avoid harassment by the police, they recently went to another soum, but police moved them on. The lack of legal rights not only lead to conflicts in ASM areas, but also human rights violations against artisanal miners who are threatened, beaten up, arrested and detained without charges. Their cash is stolen, tools are taken away, gold is confiscated and gers are demolished. When the police move the miners on, they forcibly take the miners' tools, note down their car numbers and remove the wheels of their cars.

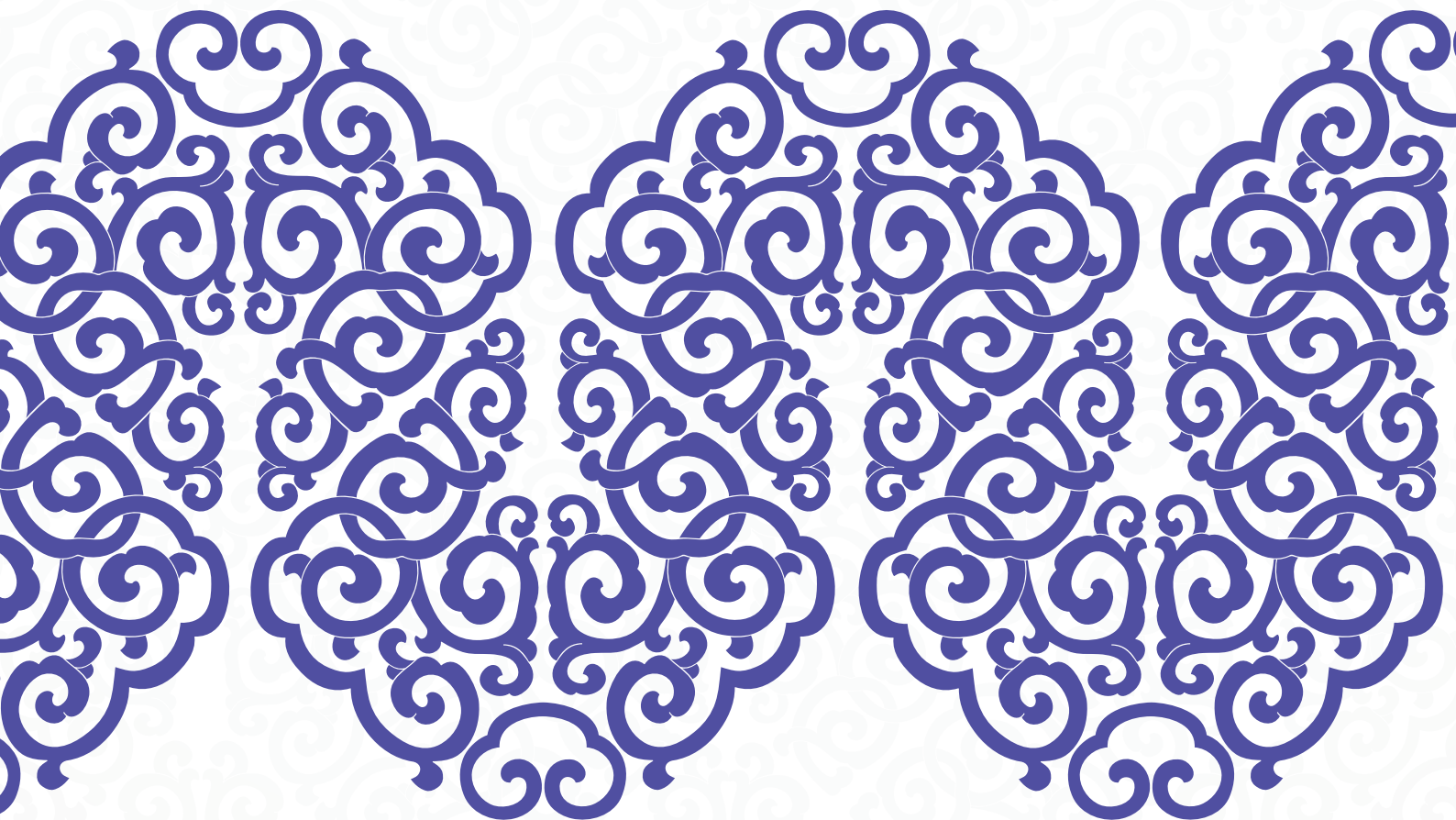
Artisanal miners are also in conflict with the local government officials who tend to protect the interests of smaller sized mining companies.

*"There is no dialogue between us and the government. For example, the artisanal miners in Sharyn Gol are able to work in an area until they find a larger gold deposit. When we find a significant amount of gold, the government orders us to leave so that the land can be leased to small mining companies. Some of these companies are owned by the government officials... and they take over the land from which the artisanal miners are kicked off."*

Artisanal miners

Research for this handbook found that there was a perception in the community that artisanal miners were used to discover deposits and were forcibly moved-on and legal small-scale mines were quickly developed by government officials. This is a significant finding, as it demonstrates the vulnerability of artisanal miners, and the unfair and unclear licensing laws benefitting government officials. Finally, it challenges the broader perception that environmental degradation and other ill-impacts from ASM are caused by artisanal miners as opposed to legally sanctioned small-scale operations. An approach which considers artisanal miners and small-scale miners with greater nuance and sensitivity towards livelihood pressures is needed. Furthermore, the findings highlight the importance of regarding ASM as a development activity that needs formalising and careful monitoring.

## **S8** Recommendations





## 8 Recommendations

The research findings raise many important considerations about the impact of mining in Mongolia on traditional herder communities. Specifically, the research provides evidence to support that women in Mongolia often experience the direct and indirect consequences of mining in more pronounced ways, yet there is limited attention paid to gender dimensions in planning for and managing the impacts of mining operations. The unique set of ecological, socio-cultural and economic considerations of the Mongolian context highlight significant threats to herder livelihoods across each of the eight mining-induced themes explored. The findings confirmed the need to consider and plan for these issues in a holistic way, giving particular consideration to the status of women. This has particular relevance for mining companies, centralised and local (soum) level governments in planning for and regulating mining sector compliance and performance.

In this final chapter we provide a synthesis of key recommendations gleaned from the research for this handbook. The recommendations were developed and refined through a review process. They are divided by theme and stakeholders for easier reading and implementation. As with any exercise in recommendation delivery, there will need to be some specific adaptation to particular contexts.

It is important that all stakeholders involved in mining in Mongolia recognise that mineral resources are finite resources associated with volatile markets. Companies, governments and communities need to work together to better plan for and manage strategies that will extend the economic and social benefits mining can bring to herding communities throughout and beyond the life of a mine. Coordinated action is needed to recognise the individual and differing needs of – and achieve better outcomes for – men, women and children within these vulnerable communities.

## 8.1 Local community development & mining

The research conducted in both regions showed that local community development remains a fundamental challenge for mining in Mongolia. While some Mongolians have experienced successful transitions to wage-based employment, improved education, health and business opportunities, many others have failed to reap benefits from mining due to an entrenched centralised system, ambiguity of government legislation, sporadic compliance by mining companies and a lack of regulatory provisions. While some mining companies are attempting to counter these negative impacts by encouraging local people and herders to work together and build social relations to improve community dynamics, boost productivity and improve livelihood objectives, many areas are struggling to adapt to the rapid pace of development. Implementing sound, targeted and inclusive-local level agreements will help vulnerable groups, including women and local herders, access more mining-generated opportunities.

### **Local Governments**

- Assess whether the relevant local government departments have the required capacity to facilitate and connect local communities and businesses with mining company needs and requirements. Where capacity is lacking, seek private (company) or donor funding to assist with capacity building skills and training.
- Where capacity is available, identify which local government department should work with the company to identify: (1) all potential direct and indirect employment opportunities that could be obtained locally; and (2) local community and business skills, capabilities and capacity. This may involve undertaking a collaborative local employment and business mapping exercise or developing a local skills and business register to identify all local skills, businesses, capacity and resources.
- Consult with women and other vulnerable groups and collect sex-disaggregated data where possible to determine the different skills, opportunities and constraints for women and men in accessing direct and indirect mining employment.

### **National government**

- Revise and apply a social context to the existing Law on Environmental Impact Assessment (EIA).
- Ensure that there is a legal requirement for companies to undertake public consultation, and properly address and mitigate social impacts of mining and/or any infrastructure projects, and address any differences between gender, age and ethnicity through the preparation of a Strategic Environmental Assessment and Management Plan.
- Provide micro finance schemes targeted at mine supply-chain small business, particularly women led small businesses.
- Create a regulatory provision to prevent, address and report workplace sexual harassment in private and public institutes.

### **Mining companies and developers**

- Ensure company policy reflects the Mongolian constitution for anti-discrimination laws and mainstream anti-discrimination practices.
- Engage with relevant local government department to identify all potential direct and indirect employment opportunities, local skills and capabilities through a collaborative employment and business mapping exercise or local skills and business register.
- Based on the local employment and business mapping or skills register, provide more targeted small-business support and skills training activities to local residents (including herders and women) for direct and indirect mine employment.
- Ensure employees have access to child-care support facilities or provide flexible work arrangements for women and men from the same household to ensure they can both participate in mine employment.
- Encourage transparency and participation in agreement-making and prioritise contribution to long-term local development through job creation, business development and sustainable procurement policies. Where confidentiality is required for legal purposes or at the request of the community, effective community engagement to justify such confidentiality should be maintained.

## 8.2 Water resources

The potential for mining to impact local water resources remains a highly contentious issue in Mongolia. In a country with limited water resources (and a population that relies heavily on accessing groundwater directly from shallow wells and surface water from rivers) deep, ongoing concern regarding water issues has led to increased regulation and monitoring. But new issues are emerging. The research demonstrated that the perceived impacts of mining on water resources vary regionally, depending on the type of mining (e.g. artisanal mining) and local availability of water. Water is also highly gendered and plays an important role in Mongolian cultural and spiritual identity. Coordinated action is needed to support the capacity and technical resources of government to ensure access to clean and reliable water supplies; advance research and community education about water issues; and train and employ local people to assist with long-term monitoring to mitigate any potential negative impacts on water resources.

### **Local Government**

- Offer information or training relating to aspects of hydrology and mine water management to establish transparency and mutual trust among stakeholders and affected herder communities.
- Provide access to support networks to empower herders to better understand the different factors affecting water resources, contribute to stakeholder discussions and help negotiate solutions.
- Provide alternative water sources to cattle and sheep if rivers are affected by mining and water quality is not suitable.
- Provide communities (including herders) with timely and accurate information on what water sources are safe to use and how it has changed from baseline conditions.

### **National Government**

- Build the technological resources and capacity of government inspectors to ensure that they have the expertise to effectively develop and implement water regulations.
- Ensure government regulations are supported by a good practice guide to mining, including water management that is tailored to Mongolia's environment, economy and culture.
- Develop a national water baseline monitoring program to prospective mining regions.
- Invest in water research at the national level to develop better knowledge of current and future risks posed by mining.
- Collect data with inexpensive continuous observations of basic climatological, hydrological and water quality variables, and supplement with intermittent measurements of other variables such as metals.

### **Mining companies and developers**

The necessary partnerships between local government and mining companies mean that all of the recommendations in the previous section apply at least partly to mining companies.

- Design and implement water baselines and monitoring prior to the mining project to distinguish between the natural variability and the different human influences.
- Publish water monitoring data summaries in a way that is accessible to communities.
- Raise company water management standards proactively in advance of regulatory developments.
- Provide part-time employment to herders through various avenues related to water, such as participatory environmental monitoring programmes. Where possible, use herders' local hydrological knowledge to gain local insights and counter perceptions of lack of trust.



## 8.3 Pasture availability

For Mongolia's pastoral, nomadic society, the land has particular meaning and consequence. Yet the combination of Mongolia's harsh climate, limited natural resources, cultural and herding traditions, and environmental degradation associated with mining impacts (e.g. use of unpaved roads) is creating increased competition for land. The research revealed that the presence of large-scale, small-scale and artisanal mining is limiting access to good quality pasture, resulting in tensions between herders and mining interests, and between herders themselves. The workloads and dangers have increased for both men and women, with men travelling further with their livestock and women forced to remain behind alone and work longer hours. Particular attention needs to be paid to the impacts of limited pasture availability on social relations and the strain on household gender relationships, alongside strategies to support best practice in land rehabilitation and reclamation.

### **Local Government**

- Require a 100% 'rehabilitation bond' and provide discounts for undertaking progressive rehabilitation and reclamation. Make all bond rules transparent.
- Undertake competitive transparent bidding by competent parties to complete land rehabilitation and reclamation work.
- Ensure adequate, effective and transparent monitoring and oversight of land rehabilitation and reclamation work. Where resources and capacity are lacking, seek private or public funding and support.

### **National Government**

- Introduce incentives to encourage vehicles to use formal and paved infrastructure roads where they exist (e.g. the paved Coal Road). For example, streamline the permit process, reduce the cost for using paved roads, increase monitoring of truck movements and impose penalties for trucks not driving on paved roads.
- Liaise and coordinate traffic monitoring and enforcement with relevant local authorities. If capacity and resources are lacking, utilise sector-specific revenues such as royalties and fees to fund necessary training and staffing.
- Facilitate collaborative infrastructure planning where formal infrastructure does not exist; and involve companies, local government and local people (including herders, women and other vulnerable groups).

### **Mining companies and developers**

- Understand the gendered impacts of mining on pasture and consult with local women and men to ensure they understand the potential impacts.
- Engage with communities, including herders and women, about land rehabilitation and reclamation work and infrastructure planning to identify customary land-uses, animal movements, least impact routes and design strategies. Adopt best practice engagement techniques and participatory mapping processes where required.
- Adopt best-practice mine rehabilitation techniques and undertake progressive land rehabilitation and reclamation work.

## 8.4 Dust occurrences

Dust pollution and dust events are some of the most visible ways people encounter the impacts of mining in Mongolia. While some of these are naturally occurring, the incidence of dust events has increased since the onset of mining. Left uncontrolled, dust emissions will continue to have a negative impact on landscapes, settlements, people and animals in Mongolia. Again, men and women are affected differently, reporting varying experiences with worsening health, altered domestic routines and increased workloads. For land-connected people who spend much of their time outdoors, dust pollution is an acute quality of life issue. Mining development must incorporate transparent and ongoing monitoring of air quality and other mining-induced dust impacts (e.g. health of people and animals, quality of pasturelands, pollution within herder communities) to support these vulnerable communities.

### **Local Government**

- Enforce the use of dust suppression measures by companies on site and on haulage roads. Penalise companies that do not comply with dust suppression requirements. This should be managed by the Natural Environment, Tourism, Geology and Mining Inspection Department of the General Agency for Specialised Inspection (GASI). Seek funding and support where capacity is lacking.
- Encourage communities and herders to report dust-related illnesses to local health facilities or organisations.

### **National Government**

- Revise and amend Law on Air 2012 to provide greater relevance to industrial activities, including mining.
- Develop a handbook, guideline or regulation that defines standards, measurements, and procedures for the control of air quality impacts of mining activities.
- Create a multi-stakeholder committee to improve dialogue on regional infrastructure development.

### **Mining companies and developers**

- Conduct transparent and ongoing monitoring of air quality and dust in line with regulatory requirements. Monitor to check compliance with regulations, determine long-term air quality trends and effectiveness of any air quality management techniques.
- Engage communities (including herders and women) in participatory dust monitoring program where possible.
- Conduct research and transparent monitoring of community and herd health impacts to determine the impact of dust emissions on their health.
- Liaise and work with local health services or organisations where possible; and provide support to local health services or organisations if under-resourced or not skilled in this area.

## 8.5 Resettlement and displacement

Displacement and resettlement of herders has increased since 2000 with the growth of the mining industry, increased pressure on land availability, road, rail and other infrastructure development around Mongolia. Resettlement and displacement is deeply disruptive for affected people. The nomadic nature of Mongolian herders makes this none less so, as herder people follow distinct patterns of movement and have deep connections with land. In Mongolia, mining is taking place where herders are already under pressure from pasture degradation, water scarcity and climate variations. The research revealed many negative impacts on herders, who feel financial, health and social impacts of being cut off from their traditional lands. Again, the implications are different for men and women. The cumulative impact is leading to some herders changing their livelihood patterns just to survive. Mining and resettlement warrants very close attention by regulators and civil society groups, and a commitment by mining companies and developers to adhere to minimum standards.

### *Local government*

- Ensure that government representatives are familiar with national and international standards and corporate commitments for resettlement in order to hold companies to account.
- Pro-active involvement of local government for effective preparation and coordination of resettlement activities.
- Collaborate with civil society organisations (CSOs)/NGOs/Cooperatives to encourage and support herders to work together during company-community engagements about resettlement.

### *National government*

- Establish clear compensation criteria that are based on a model/formula for estimating the full impacts of mining-induced development and resettlement (MIDR) on sustainable livelihoods, including appropriate compensation for 'common use' summer grazing land.
- Require companies to formalise all resettlement compensation agreements, and engage herders collectively, rather than only entering into family-level negotiations.
- Ensure that EIA process include consultations on MIDR, including with women and men.
- Provide free legal services for herders and other parties on resettlement.

### *Mining companies and developers*

- Adhere to international standards when formulating plans for acquisition of land and assets, relocation, compensation and livelihood restoration, including the participation of women and men.
- Conduct a baseline study on the socio-economic situation of herders and women, and study the impacts of MIDR on sustainable livelihoods.
- Ensure that Resettlement Action Plans (RAPs) draw on the baseline study and consultations with local authorities and affected herders. RAPs should be endorsed by these parties and outline a grievance mechanism for when issues arise.
- Ensure that both physical and economic displacement are understood and accounted for. Compensation should cover for lost assets and livelihoods.
- Ensure that where resettlement is to take place, there is adequate internal knowledge and capacity to engage with resettled people, manage a resettlement and livelihood restoration process, and handle grievances and conflict.
- Base compensation and resettlement on good understanding of water impacts and the inter-relation between land value, water and culture.



## 8.6 Artisanal and small-scale mining

There were many findings that challenged the broad perception that environmental degradation and other ill-impacts from artisanal and small-scale mining is predominately caused by artisanal miners as opposed to legally sanctioned small-scale operations. The research uncovered the extent of the vulnerability of artisanal miners, many of whom suffer from the effects of poor health and safety, and limited regulation. Artisanal miners are used to discover deposits and then are forcibly moved-on to make way for legal small-scale mines quickly developed by government officials, with unfair and unclear licensing laws benefitting government officials. An approach which considers artisanal miners and small-scale miners with greater nuance and sensitivity towards livelihood pressures is needed. Furthermore, the findings highlight the importance of regarding artisanal and small-scale mining as a development activity that needs formalising and careful monitoring.

### **Local Government**

- Improve access to land in consultation with herders and artisanal miners to recognise their livelihood.
- Provide better occupational health and safety, in particular with regard to the use of mercury and the lack of improved technologies.

### **National Government**

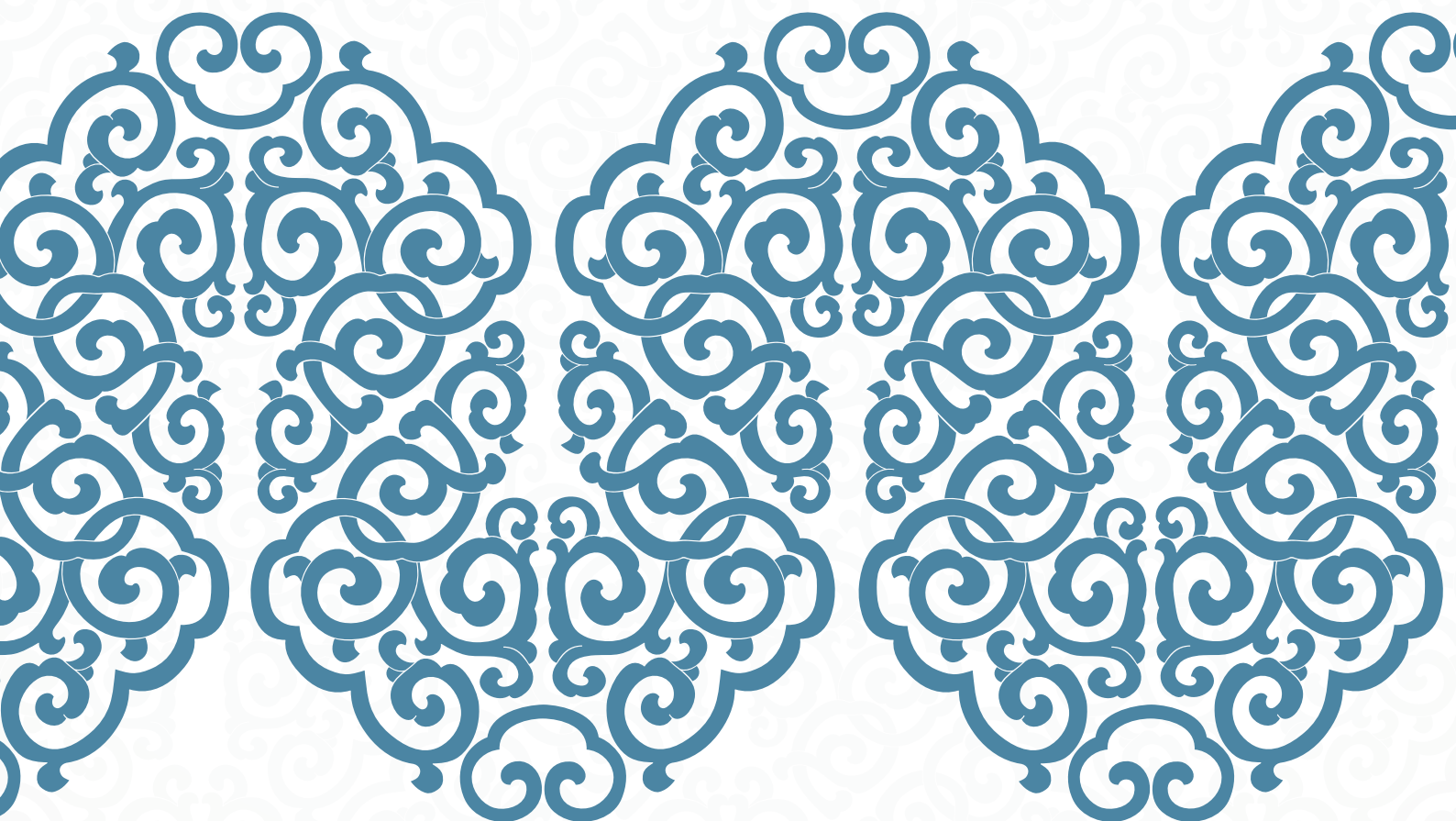
- Formalise the marketing chain for gold produced through artisanal mining; and ensure a business case based on community health, environment and social development rather than solely tax imperative drives policy.
- Improve women's status within the overall ASM sector by taking up women-specific projects.

### **Mining companies and developers**

The necessary partnerships between local government and mining companies mean that all of the recommendations in the previous section apply at least partly to mining companies.

- Consult with Mongolian regions to inform, engage and perceive impacts attributed to artisanal and small-scale mining as both a livelihood issue and as contributors to environmental degradation in the natural capital.
- Provide additional resource allocation for local soum health clinics to ensure they consider de-facto population size instead of relying on local statistics that might focus on only registered communities.

# s9 Appendix



## 9.1 Appendix A: Types of mining

Where materials occur in directly usable forms in the earth's crust, such as coal or some construction materials from quarries, they can be directly dug up, crushed and used with no treatment or extraction processes. Such activity is more accurately referred to as quarrying and can be done above ground or underground.

Except for placer mining for particular metals such as gold which occur as flakes or nuggets in natural systems, all metal mining

activity requires some level of chemical processing to extract the usable metal from the ore. This extraction process can be done at a small-scale or a large industrial scale. Here too the activity can occur above ground or underground at both large and small-scales. Some broad definitions of the various types of mining in the Mongolian context are provided in the table below.

Type of mining	Description of mining
Artisanal mining	This form of mining is undertaken by individuals for subsistence purposes using rudimentary equipment to either collect placer deposits of gold or gemstones or using extraction chemicals such as mercury or cyanide in simple apparatuses for gold extraction. Some artisanal mining may involve simply extracting the ore and selling it unrefined to operations which have the capacity to refine the material.
Small-scale mining	This term is often used interchangeably with artisanal mining but refers to a slightly more mechanised system of extraction being led by small entrepreneurs who hire workers with some greater degree of organisation and hierarchy within the mineral extraction activity. Often this kind of mining first involves dislodging the ore using high pressure water hoses and referred to as hydraulic mining.
Open-pit mining	A common form of industrial mining activity which approaches the ore through a sequential terracing process that creates a pit as the deeper parts of the ore are reached. Such mining activity has a large landscape impact and restoration of the landscape can be more challenging. Often the large pits can be filled with water to create artificial lakes after the end of the mining activity.
Underground (hard-rock) mining	Some ore bodies are inaccessible and uneconomic to extract with pits. In such cases, deep shafts can be dug with perpendicular tunnels to reach the ore and extract it with mechanised systems and transport it to the surface for processing. Such mining has a lower landscape impact than open-pit but poses greater health and safety concerns for workers.
In-situ leaching	For some metals it may be possible to inject chemicals deep underground and dissolve the usable ions in a solution for extraction above surface. This form of mining has been used particularly for uranium extraction.



## 9.2 Appendix B: Life of Mine

LOCAL COMMUNITY DEVELOPMENT - IMPACTS	EXPLORATION	PLANNING AND FEASIBILITY*	CONSTRUCTION	OPERATION	MINE CLOSURE AND REHABILITATION
	<ul style="list-style-type: none"><li>• Influx of relatively small workforce</li><li>• Some speculative business opportunities and development</li></ul>	<ul style="list-style-type: none"><li>• Influx of relatively small workforce</li><li>• Some speculative business opportunities and development</li></ul>	<ul style="list-style-type: none"><li>• Direct employment opportunities through local procurement</li><li>• Large influx of often temporary workforce can lead to range of social issues (alcohol, drugs, violence, diseases etc.) and place pressures on existing basic social services and infrastructure</li><li>• Company developed infrastructure and basic services</li></ul>	<ul style="list-style-type: none"><li>• Employment and procurement opportunities</li><li>• Population influx places pressures on existing basic social services and infrastructure</li><li>• Company funded infrastructure and basic services</li></ul>	<ul style="list-style-type: none"><li>• Reductions in employment and business opportunities directly connected to mining</li><li>• Potential maintenance issues of company developed infrastructure and services</li></ul>
RECOMMENDED ACTIVITIES FOR LOCAL STAKEHOLDERS	<p><i>Local Government</i></p> <ul style="list-style-type: none"><li>• Develop a regular dialogue with companies</li><li>• Provide information to communities about expected mining activities and potential future impacts</li><li>• Regularly monitor social impacts company exploration activities</li></ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"><li>• Engage with and inform local stakeholders (government and local peoples) about exploration activities</li><li>• Manage local expectations with clear and regular communication</li><li>• Collect environmental and social baseline data</li><li>• Develop a community grievance management mechanism</li></ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"><li>• Maintain regular dialogue with companies</li><li>• Undertake collaborative social and business mapping and opportunities assessment with companies to identify local peoples' priorities, interests, skills and capabilities. Ensure women and other vulnerable groups are consulted.</li><li>• Begin agreements dialogue with companies, engage communities (particularly women and other vulnerable groups)</li></ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"><li>• Engage experts and undertake detailed social baselines, impact assessment and social impact management plans</li><li>• Engage local stakeholders (local government and people) in closure planning discussions</li><li>• Maintain regular local stakeholder dialogue, including women and other vulnerable groups</li><li>• Undertake collaborative social and business mapping and opportunities assessment with local government</li><li>• Plan for and build capacity of local people for future workforce and local procurement needs and opportunities</li><li>• Plan for sustainable regional infrastructure development</li><li>• Develop corporate social responsibility (CSR) or community</li><li>• Development plan (outline proposed community relations team, strategies and budget)</li><li>• Begin agreements dialogue with government</li></ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"><li>• Maintain regular dialogue with company</li><li>• Regular monitor social impacts of company construction activities</li><li>• Continue 'community agreements' dialogue with companies and engage communities</li><li>• Develop infrastructure and social services for growing population</li></ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"><li>• Increase regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li><li>• Implement grievance management mechanism</li><li>• Undertake community relations (CR) activities and implement CSR plan</li><li>• Develop basic infrastructure and services</li><li>• Regularly monitor impacts of construction activities</li><li>• Implement impact management plans</li></ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"><li>• Sign negotiated 'community agreement'</li><li>• Maintain regular dialogue with company</li><li>• Regularly monitor social and development impacts of company operational activities</li></ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"><li>• Increase regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li><li>• Monitor and adjust CR activities and implement CSR plan</li><li>• Regularly monitor social and development impacts of operational activities</li><li>• Ongoing implementation of impact management plans</li><li>• Full functioning grievance management mechanism</li><li>• Undertake additional studies as required</li></ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"><li>• Maintain regular dialogue with companies about proposed closure impacts on local communities, businesses, social services and basic infrastructure</li></ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"><li>• Continue to engage local stakeholders (local government and people) in closure planning discussions</li><li>• Conduct socio-economic mine closure impact assessment and management plans</li><li>• Manage and support local community post-mining transition (support local businesses and people)</li><li>• Maintain regular updates</li><li>• Conduct socio-economic mine closure impact assessment and management plans</li></ul>

\* The planning and feasibility phase predominantly involves extensive technical studies and consultations between companies, government and local people.

WATER IMPACTS	EXPLORATION	PLANNING AND FEASIBILITY*	CONSTRUCTION	OPERATION	MINE CLOSURE AND REHABILITATION
	<ul style="list-style-type: none"> <li>• Small or negligible effect on surface and/or ground water resources dependent on adopted technique (e.g. remote sensing techniques have no impact, drilling requires water for lubrication).</li> </ul>	<ul style="list-style-type: none"> <li>• Small or negligible effect on surface and/or ground water resources dependent on adopted technique (e.g. remote sensing techniques have no impact, drilling requires water for lubrication).</li> </ul>	<ul style="list-style-type: none"> <li>• Large infrastructure developments (e.g. dams, reservoirs, wells and pipelines) can reduce regional water availability</li> <li>• Runoff of contaminants (sediment, contaminated soils, diesel) generated during construction activities can affect surface water bodies' quality</li> <li>• Stream diversions alter natural hydrology</li> </ul>	<ul style="list-style-type: none"> <li>• Mineral processing, dust suppression, power generation and domestic use can alter water resources and reduce regional water availability</li> <li>• Pit dewatering can result in drawdowns of groundwater sources</li> <li>• Water quality may be degraded due to soil erosion of waste spoils and water discharges</li> </ul>	<ul style="list-style-type: none"> <li>• Tailings, wastewater management and rehabilitation strategies for impacted water systems and quality</li> </ul>
RECOMMENDED ACTIVITIES FOR LOCAL STAKEHOLDERS	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Develop a regular dialogue with companies about potential impacts on surrounding water resources covering construction, operations and post-closure</li> <li>• Monitor impacts of company exploration activities on water resources (e.g. waste water discharge)</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage with and inform local government and people (including herders, women and vulnerable groups) about mining operations' water requirements and potential impacts on surrounding water resources</li> <li>• Manage local expectations with clear and regular communication</li> <li>• Collect surface and groundwater baseline data</li> <li>• Develop a community grievance management mechanism</li> <li>• Seal exploration boreholes to prevent contamination of aquifers</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Maintain regular dialogue with companies about potential impacts on water resources</li> <li>• Develop water monitoring plans that account for proposed mining development</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage experts and undertake environmental (water) baseline studies and impacts assessments</li> <li>• Develop household knowledge of water uses, including roles and responsibilities of men, women and children</li> <li>• Develop water management plan covering management, monitoring and reporting of all operational, social and environmental risks, using good practice guides, including construction, operations and post-closure phases.</li> <li>• Maintain regular dialogue with local stakeholders (including herders, women and other vulnerable groups) about mining operations' water requirements and potential impacts on surrounding water resources</li> <li>• Seal exploration boreholes to prevent contamination of aquifers</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Regularly monitor water impacts of mining companies activities</li> <li>• Maintain regular dialogue with company about ongoing impacts of mining construction activities on water availability and quality</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Develop a 'community consultative committee' to ensure communities are informed and have input into water management</li> <li>• Implement water management plans, including water management, monitoring and reporting</li> <li>• Regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li> <li>• Implement grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Regularly monitor water impacts of mining companies activities</li> <li>• Maintain regular dialogue with company about ongoing impacts of mining construction activities on water availability and quality</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Implement water management plans, including water management, monitoring and reporting</li> <li>• Update water management plans to address new problems and opportunities</li> <li>• Regular stakeholder engagement to report community concerns, feedback and grievances</li> <li>• Implement grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Maintain monitoring of quality of surrounding water resources</li> <li>• Maintain regular dialogue with companies about proposed closure impacts and rehabilitation strategies</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Continue to engage local stakeholders (local government and people) in discussions about rehabilitation design and implementation and risks to water</li> <li>• Conduct mine closure impact assessment and management plans</li> <li>• Maintain regular updates</li> </ul>

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IMPACTS ON PASTURE AVAILABILITY	EXPLORATION	PLANNING AND FEASIBILITY*	CONSTRUCTION	OPERATION	MINE CLOSURE AND REHABILITATION
	<ul style="list-style-type: none"> <li>• Mining exploration activities and associated traffic may cause small or minimal land disturbance on surrounding land and soils</li> <li>• and soils depending on adopted exploration techniques (e.g. drilling may disturb land, trenching/pitting may disturb land and cause erosion)</li> </ul>	<ul style="list-style-type: none"> <li>• Early stage feasibility and mine planning activities and associated traffic may cause small or minimal land disturbance on surrounding land and soils</li> </ul>	<ul style="list-style-type: none"> <li>• Site preparation and construction activities usually involves acquiring large areas of land, clearing vegetation and altering the landscape</li> <li>• Vehicle operation and overland travel may cause soil erosion and fragment land</li> <li>• Construction of supporting infrastructure (access roads, power lines etc.) requires sizeable parcels of land and further fragments available land</li> <li>• Loss of land for grazing animals and community livelihood activities</li> </ul>	<ul style="list-style-type: none"> <li>• Land disturbance can be substantial, depending on type of mine (open cut mines tend to have a great surface disruption and large volume of waste rock, underground mines can cause land subsidence)</li> <li>• Unstabilised disturbed land is more susceptible to wind and water erosion</li> <li>• Vehicle operation and overland travel may cause soil erosion and fragment land</li> <li>• Mining activities (airborne particle matter or seepage into ground or surface water) may contaminate soils and plants, which can stress and stunt pasture vegetation</li> <li>• Loss of land for grazing animals, community livelihood strategies, and wildlife corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Best practice rehabilitation can restore the landscape and improve economic productivity of land</li> </ul>
RECOMMENDED ACTIVITIES FOR LOCAL STAKEHOLDERS	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Maintain regular dialogue with companies about mining operations' proposed impacts on pasture availability and quality, and surrounding soils</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Collect pasture quality baseline data</li> <li>• Map available pasture and existing land uses (including customary land rights where applicable)</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Maintain regular dialogue with companies about potential impact of mining operations on pasture quality and availability</li> <li>• Engage with companies about proposed infrastructure requirements and regional infrastructure planning</li> <li>• Enforce the 'rehabilitation bond' requirement under the Minerals Law</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage experts and undertake detailed existing land use, and pasture quality and quantity baselines, impacts assessments and impact management plans (as part of EIA)</li> <li>• Ensure EIA process address potential cumulative impacts associated with other developments.</li> <li>• Engage relevant stakeholders to develop pasture management and closure plans that clearly state the companies rehabilitation strategies, success criteria, performance targets and post-closure land use</li> <li>• Maintain regular dialogue with local stakeholders (including herders, women and other vulnerable groups) during infrastructure planning</li> <li>• Develop infrastructure plans focusing on road networks, minimising the number of tracks/roads. Engage with government and other mining operations about regional infrastructure development planning and potential coordination to minimise impacts on surrounding environment</li> <li>• Develop grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Monitor and regulate mining operations' impact on land and company-led land reclamation and rehabilitation work.</li> <li>• Maintain regular dialogue with companies about mining operations' impact on land and future land reclamation and rehabilitation work.</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Implement pasture management strategies and undertake progressive rehabilitation where possible</li> <li>• Monitor pasture quality and quantity in terms of predefined success criteria and performance targets. Report and disseminate performance findings in locally appropriate manner</li> <li>• Construct coordinated and least impact infrastructure</li> <li>• Increase regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li> <li>• Implement grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Undertake competitive and transparent bidding process to select companies to undertake reclamation and rehabilitation work</li> <li>• Undertake effective and transparent monitoring of land reclamation and rehabilitation.</li> <li>• Maintain regular dialogue with communities about mining operations' impact on land, and company-led land reclamation and rehabilitation work.</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Implement pasture management strategies and undertake progressive rehabilitation where possible</li> <li>• Monitor pasture quality and quantity in terms of predefined success criteria and performance targets. Report and disseminate performance findings in locally appropriate manner</li> <li>• Undertake research into best practice rehabilitation strategies to improve site rehabilitation techniques</li> <li>• Full functioning grievance management mechanism</li> <li>• Regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Undertake competitive and transparent bidding process to select companies to undertake reclamation and rehabilitation work</li> <li>• Undertake effective and transparent monitoring of land reclamation and rehabilitation.</li> <li>• Maintain regular dialogue with companies about proposed closure impacts and rehabilitation strategies</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage local stakeholders (local government and people) about closure plan implementation</li> <li>• Maintain regular updates</li> <li>• Provide regular updates to local stakeholders about proposed changes in plans or strategies.</li> </ul>

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DUST OCCURRENCES - IMPACTS	EXPLORATION	PLANNING AND FEASIBILITY*	CONSTRUCTION	OPERATION	MINE CLOSURE AND REHABILITATION
	<ul style="list-style-type: none"> <li>Increased mining exploration activities and movements may have small or minimal impact on surrounding soils depending on adopted exploration techniques</li> </ul>	<ul style="list-style-type: none"> <li>Increased mining exploration activities and movements may have small or minimal impact on surrounding soils depending on adopted exploration techniques</li> </ul>	<ul style="list-style-type: none"> <li>Increased exposure to particle matter and dust from chemicals used during construction or movement of soil/vegetation/rock and vehicles, or</li> <li>Air, water and soil pollution</li> <li>Community nuisance or annoyance</li> <li>Community and livestock health impacts, due to excessive inhalation or digestion</li> </ul>	<ul style="list-style-type: none"> <li>Increased exposure to particle matter and dust from operation activities, including mineral storage, and onsite and off-site vehicular movements</li> <li>Air, water and soil pollution</li> <li>Community nuisance or annoyance</li> <li>Community and livestock health impacts, due to excessive inhalation or digestion</li> </ul>	<ul style="list-style-type: none"> <li>Reduced dust emissions due to ceased mine operation and mine-supporting activities (including less vehicle movements)</li> <li>Rehabilitation can restore surface stability, reducing soil erosion and minimising dust emissions</li> </ul>
RECOMMENDED ACTIVITIES FOR LOCAL STAKEHOLDERS	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>Develop regular dialogue with companies about mining operations' potential dust emissions and impact on surrounding communities and soils</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>Engage with and inform local government and people (including herders, women and vulnerable groups) about the potential future mining dust emissions and their impact on air quality and local people</li> <li>Collect air quality baseline data</li> <li>Collect community and animal health baseline data</li> <li>Develop a plan to suppress predicted dust emissions</li> <li>Develop a community grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>Maintain regular dialogue with companies about potential mining-generate dust emissions and their impact on air quality, and human and herd health</li> <li>Engage with companies on proposed infrastructure requirements and regional infrastructure planning to minimise dust emissions.</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>Engage experts and undertake detailed air quality baselines, impact assessment and impact management plans (as part of EIA)</li> <li>Ensure EIA process addresses potential cumulative impacts associated with other developments</li> <li>Maintain regular dialogue with local stakeholders (including herders, women and other vulnerable groups) during infrastructure planning</li> <li>Develop infrastructure plans focusing on road networks, minimising the number of tracks/roads. Engage with government and other mining operations about regional infrastructure development planning and potential coordination to minimise impacts on surrounding environment</li> <li>Develop grievance management mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>Regularly, monitor and regulate company dust emissions and air quality</li> <li>Maintain regular dialogue with companies about proposed dust emissions and their impact on air quality, and human and herd health.</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>Implement air quality management plans</li> <li>Regularly monitor air quality and dust emissions on and off-site. Disseminate findings to local stakeholders</li> <li>Undertake research into the health and livestock impacts of dust emissions</li> <li>Construct coordinated infrastructure routes to minimise impact on surrounding environment</li> <li>Increase regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li> <li>Implement grievance management mechanism</li> <li>Regularly suppress mine-generated dust emissions</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>Monitor and regulate company dust emissions and air quality</li> <li>Maintain regular dialogue with companies about proposed dust emissions impact on air quality, and human and herd health</li> <li>Provide information on dust emissions to community</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>Regularly monitor air quality and dust emissions on and off-site. Disseminate findings to local stakeholders</li> <li>Ongoing implementation of air quality management plans</li> <li>Full functioning grievance management mechanism</li> <li>Continue research into the human and livestock health impacts of dust emissions</li> <li>Compensate households adversely affected by dust emissions.</li> <li>Regular stakeholder engagement with community relations team to report community concerns, feedback and grievances</li> <li>Regularly suppress mine-generated dust emissions</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>Maintain regular dialogue with companies about proposed closure impacts and rehabilitation strategies</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>Engage local stakeholders (local government and people) in closure planning discussions and rehabilitation strategies to minimise dust from disturbed lands.</li> <li>Conduct mine closure impact assessment and management plans</li> <li>Maintain regular updates</li> </ul>

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RESETTLEMENT AND DISPLACEMENT IMPACTS	EXPLORATION	PLANNING AND FEASIBILITY*	CONSTRUCTION	OPERATION	MINE CLOSURE AND REHABILITATION
	<ul style="list-style-type: none"> <li>• Mining exploration activities may physically displace a small number of local people, depending on the exploration technique employed. Displacement may be temporary.</li> </ul>	<ul style="list-style-type: none"> <li>• Resettlement planning undertaken through Resettlement Action Plans (RAPs), which are designed as part of EIA. A number of different baseline and impact studies will need to inform the RAP.</li> </ul>	<ul style="list-style-type: none"> <li>• Large proportion of resettlement occurs in the construction phase to commence the mine development process, according to the approved mine plan</li> </ul>	<ul style="list-style-type: none"> <li>• Resettlement can also occur during operations due to new discoveries and changes to mine plans leads. This can lead to new land being required for roads, ancillary infrastructure, waste dumps, processing plants or pit expansions.</li> <li>• RAP implementation, monitoring and livelihood reconstruction largely tends to occur in the operations phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced dust emissions due to ceased mining activities (including fewer vehicle movements)</li> <li>• Rehabilitation can restore surface stability, reducing soil erosion and minimising dust emissions</li> </ul>
RECOMMENDED ACTIVITIES FOR LOCAL STAKEHOLDERS	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Proactively engage with companies about resettlement planning and proposed activities</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage with local government and local people (including herders, women and other vulnerable groups) to understand the operations' potential impacts on surrounding land, households and communities</li> <li>• Start collecting socioeconomic baseline data, including land rights and usage patterns, physical assets of potentially affected households, common resources, livelihood strategies etc.</li> <li>• Develop a community grievance mechanism</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Proactively engage with companies about resettlement planning</li> <li>• Work with local organisations (NGOs, CSOs and Cooperatives) to support herders to work together during company-community resettlement negotiations</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Conduct a socioeconomic baseline (through socioeconomic mapping, census, inventory of assets, socioeconomic surveys and/or local stakeholder engagement) to identify all affected people and potential impacts on livelihoods. Engage experts where required.</li> <li>• Drawing on the baseline study and stakeholder consultation, formulate a Resettlement Action Plans (RAPs) (as part of an EIA). Engage experts where required:             <ul style="list-style-type: none"> <li>o Identify resettlement sites</li> <li>o Develop a compensation strategy (include compensation for loss of assets and livelihood), including eligibility requirements, compensation/ livelihood restoration packages and schedule for payments</li> <li>o Identify organisational capacity and responsibilities, and define implementation schedules and resources</li> </ul> </li> <li>• Ensure there is capacity and resources to proactively engage with affected people about grievances, resettlement assistance and livelihood restoration package options. Provide special assistance to women and vulnerable groups where required.</li> <li>• Develop grievance management mechanism and ensure there is adequate internal resources and capacity to adequately handle grievances and conflict</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Monitor and maintain regular dialogue with companies and local people about resettlement and livelihood restoration activities and potential grievances and conflicts</li> <li>• Liaise with National Government about non-compliant companies and penalising poor practice</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Implement RAP and associated resettlement/livelihood restoration activities as required</li> <li>• Increase stakeholder engagement to ensure affected people are advised about potential resettlement scenarios, and resettlement assistance options, and can report concerns, feedback and grievances relating to resettlement activities</li> <li>• Implement grievance management mechanism and ensure there is adequate internal resources and capacity to adequately handle grievances and conflict</li> <li>• Monitor and report on implementation outcomes of resettlement/livelihood restoration activities</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Monitor and maintain regular dialogue with companies and local people about resettlement and livelihood restoration activities and potential grievances and conflicts</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Continue implementation of RAP and associated resettlement/ livelihood restoration activities as required</li> <li>• Maintain stakeholder engagement to ensure affected people are supported through the resettlement process, and can report concerns, feedback and grievances relating to resettlement activities</li> <li>• Continue implementation of grievance mechanism and ensure there is internal resources and capacity to handle grievances and conflict</li> <li>• Monitor and report on implementation outcomes of resettlement/livelihood restoration activities</li> </ul>	<p><i>Local Government</i></p> <ul style="list-style-type: none"> <li>• Maintain regular dialogue with companies and local people about rehabilitation strategies</li> </ul> <p><i>Mining companies and developers</i></p> <ul style="list-style-type: none"> <li>• Engage local stakeholders (local government and people) throughout closure planning preparations and discussions</li> </ul>

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## 10 Acronyms

AM	Artisanal mining	LOM	Life of mine
ASM	Artisanal and Small-Scale Mining	MIDR	Mining-induced development and resettlement
AUD	Australian dollar	MMSD	Mining, Minerals and Sustainable Development
CAO	Compliance Advisor Ombudsman	MNHRC	Mongolian National Human Right Commission
CMCS	Computerised Mining Cadastre System	MNS	Mongolian National Standards
CR	Community relations	MRAM	Minerals Resources Authority
CRK	Citizens Representatives' Khural	NGO	Non-governmental organisation
CSR	Corporate social responsibility	NRGI	Natural Resources Governance Institute
EBRD	European Bank for Reconstruction and Development	OP	Operational policy
EIA	Environment impact assessment	OT	Oyu Tolgoi
ESIA	Environmental and social impact assessment	RAP	Resettlement action plan
EITI	Extractive Industries Transparency Initiative	SAM	Sustainable Artisanal Mining
FIFO	Fly-in fly-out	SDC	Swiss Agency for Development and Cooperation
GASI	General Agency for Specialized Investigation	SEAT	Socio-economic assessment toolbox
GDP	Gross domestic product	SIA	Social impact assessment
GIS	Geographical Information Systems	SLA	Sustainable Livelihoods Approach
HIA	Health Impact Assessment	SSM	Small-scale mining
HRIA	Human Rights Impact Assessment	UHG	Ukhua Khudag
ICMM	International Council of Mining and Metals	UN	United Nations
IFC	International Finance Corporation's	UNDP	United Nations Development Programme
JSC	Joint Stock Company	UNEP	United Nations Environmental Programme
LDF	Local Development Fund	WHO	World Health Organisations

## 11 Glossary

<i>Aimag</i>	Provincial level government
<i>Arul</i>	Dried dairy curd
<i>Dzuds</i>	An extreme multiple natural disaster involving summer droughts, which result in limited pasture and production of hay, followed by extreme winter temperatures, snow and winds.
<i>Ger</i>	Traditional Mongolian dwelling
Grievance mechanism	Formal complaint process that is used by individuals or organisations that are negatively affected by a certain business or operation
<i>Guanz</i>	Mongolian roadside café or restaurant
<i>Khot ail</i>	Generally small residential and socio-economic units, whereby member households work together to complete everyday herding tasks
<i>Nutag</i>	Refers to the actual place a person is born, or land of significance given to them from a family elder. A person's Nutag holds both an affective and moral obligation to guard the land.
Social license to operate	A term used to explain the host community's consent or approval of the mining activity.
<i>Soum</i>	District / local level government



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