



ASIA-PACIFIC NETWORK FOR
GLOBAL CHANGE RESEARCH

CLIMATE ADAPTATION FRAMEWORK

Final Report

Project Reference Number: CAF2014-CD04NSY-SHARMA

CAN TRADITIONAL LIVELIHOODS AND MINING CO-EXIST IN A CHANGING CLIMATE: STRENGTHENING PUBLIC- PRIVATE PARTNERSHIPS IN MONGOLIA TO REDUCE RISK AND ADDRESS LOSS AND DAMAGE

The following collaborators worked on this project:

1. Dr Vigya Sharma, University of Queensland, Australia, v.sharma@uq.edu.au
2. Dr Byambajav Dalaibuyan, University of Queensland, Australia, b.dalaibuyan@uq.edu.au
3. Ms. Saruulzaya Adiya, Mongolian Academy of Sciences, Mongolia, saruulzaya@gmail.com
4. Dr Gerelt-Od Erdenebileg, Civic Solutions, Mongolia, gereltod_er@yahoo.com
5. Dr Myagmartsooj Natsag, Mongolian State University of Education, Mongolia, tsooj0303@yahoo.com



Project Reference Number: CAF2014-CD04NSY-SHARMA

"Can Traditional Livelihoods and Mining Co-exist in a Changing Climate: Strengthening Public-Private partnerships to Reduce Risk and Address Loss and Damage"

Final Report submitted to APN

©Asia-Pacific Network for Global Change Research

OVERVIEW OF PROJECT WORK AND OUTCOMES

Non-technical summary

From the perspective of Mongolia's long-term sustainability, both herding and mining compete over access to key natural resources such as land and water. In a changing climate, these resources are going to be further stressed; in the absence of a robust response mechanism, this may lead to greater conflicts between Mongolia's two primary economic enterprises. This research project proposed to address how mining and herding may identify synergies to co-exist in a changing climate. It was founded on the premise that while the herders maintain generations of rich traditional knowledge about local climate patterns, topography, past natural disasters and local nuances of animal husbandry, mining companies are well resourced and have access to the latest technology and R&D. Together they can work towards building a Mongolia that is more resilient to climatic perturbations and resulting Loss and Damage.

The project undertook three capacity-building workshops in Mongolia to explore the potential of public-private-civil society partnerships to address and better manage future climate risks. The workshops focused on understanding how climatic changes impacted both herding and mining – although in varied forms – and how each economic sector could leverage their resources to devise actions, strategies and tools that may help build their capacities and boost resilience to tackle changing climatic conditions.

Keywords

Climate change, mining, traditional livelihoods, Mongolia, public-private partnerships, natural disasters, adaptation

Objectives

The project brought together two of Mongolia's key economic sectors – mining and herding – that are otherwise in conflict over access to land and water resources, to work in collaboration with government and civil society. The project aimed to identify risks from climatic changes across these sectors and build capacity to adapt to these changing conditions with a view to reducing resulting loss and damage through both incremental and transformative changes.

In particular, the project had the following five objectives:

1. Identify impacts of climate change on key sectors, including mining, herding, and civil society activities;
2. Identify current capacity within each sector to deal with these impacts;
3. Identify priority impacts and outline specific activities that can be undertaken in a collaborative manner for each impact;
4. Identify main barriers to collaboration; and
5. Identify ways to overcome these barriers – how, what and by whom can support be provided to overcome barriers.

Amount received and number years supported

The Grant awarded to this project was: US\$30,000 for one (1) year.

Activity undertaken

The project involved three workshops – two were undertaken at the aimag (provincial) level and one workshop in Mongolia's capital, Ulaanbaatar (UB). Approximately 40-45 participants attended each of the three full-day workshops. Participants in the regional workshops included representatives from herding groups, mining companies, local, provincial and national government, media and civil society.

A final multidisciplinary workshop was organised in UB with two key objectives:

1. To conclude the project by presenting key findings from the two regional workshops, including identifying both short and long-term policy concerns, priorities and possible solutions in relation to climate adaptation by building local resilience; and
2. To generate support for the idea of a 'Knowledge Hub' with an audience comprising policymakers, representatives from key industry bodies and other relevant national agencies. It was hoped that the latter would allow improved exchange of information, skills and needs-based learning between Mongolia's grassroots and institutional communities.

Results against Original Objectives

The project was the first of its kind in Mongolia that brought together two of Mongolia's key economic sectors of herding and mining to consider climate change as a common concern and one that would require unconventional but realistic changes to the current *modus operandi* of policy- and decision-making in Mongolia. The project was successful in addressing all five project objective and was able to capture in some detail, current levels of knowledge within the aimags of disaster management, emerging climatic thresholds as well as key grassroots concerns and priorities in relation to reducing vulnerability by building resilience to disaster events.

As outlined earlier in project objectives, workshop activities and subsequent discussions allowed participants to successfully interrogate amongst themselves, the opportunity for cross-sectoral collaboration and the potential to move beyond sectoral differences to identify synergies for cooperation.

Relevance to the APN Goals under its Climate Adaptation Framework, Science Agenda and to Policy Processes

This project was in line with APN Climate Adaptation Network's aim to address linkages, priorities and limitations of CCA, DRR & L+D. Firstly, the project's focus on Mongolia being a remote region with workshop focus on extremely remote communities (Omnogovi and Dornod regions) with limited access to information and resources was in line with APN's priority areas for the call under which the project was submitted. Secondly, the project's focus on building capacity for public-private-civil society partnerships for CCA, DRR and L+D in mining regions and remote rural communities was relevant and consistent with APN's thematic areas of interest on disaster prevention; gap analyses on regional needs and the present status quo; limits to adaptation; and guidance with the development of policy and planning strategies to address loss and damage. The project had several components closely aligned with APN's focus and relevance: it aimed to strengthen partnerships and cross-sectoral enablers that support coordinated approaches to CCA, DRR and L+D; it aimed to increase the knowledge base of CCA, DRR and L+D among public and private institutions; it aimed to map different stakeholders and

disaster scenarios to improve disaster risk management at the provincial and district levels; the workshops provided opportunities to create science-policy interface; as well as to raise awareness of CCA, DRR and L+D and to improve coordination among key stakeholders with a view to inform national policy pathways on CCA and DRR.

Self Evaluation

Stakeholder participation was beyond expectations with participants deeply interested in better understanding Mongolia's climate-livelihoods-mining nexus and how this nexus might impact them now and into the future.

The workshops were successful in achieving their objectives of bringing stakeholder together to have a robust discussion on partnership-based climate adaptation and management of climate risks and ensuing loss and damage.

Potential for Further Work

There is much scope for findings from this project to be scaled up and applied to other aimags across Mongolia, particularly in the West where there is a strong minority population of Kazakhs, and the socio-economic landscape is markedly different from the rest of Mongolia. The 'Knowledge hub' idea also requires greater work in terms of attracting government and private sector attention for its operationalization, including generating funds to sustain the Hub and its activities into the future.

Publications (please write the complete citation in APA 6th Edition)

One journal publication is expected for submission by October 2015. APN will be notified when it is confirmed.

Dr. Sharma wrote an online article for the 1st edition of the 2015 Newsletter series for the Environment, Conflict and Cooperation platform, hosted by Adelphi, a Berlin-based think tank and supported by Germany's Federal Foreign Office. The article can be accessed from <https://library.ecc-platform.org/news/mining-and-traditional-livelihoods-mongolia%E2%80%99s-future-changing-climate-0>

Acknowledgments

The team acknowledges the support provided by various agencies of the Mongolian government for this project. In particular, we would like to thank Dr S. Oyun, then Minister of Environment and Green Development, the governors of Umnugovi and Bayankhongor aimags and our aimag coordinators, and Sustainable Artisanal Mining (SAM) of the Swiss Development Cooperation and Oyu Tolgoi LLC for help with our workshops as part of this project. Dr Sharma would also like to thank her two translators for their assistance during the field trip.

Table of Contents

Preface	2
Introduction.....	2
<i>a. Background Information.....</i>	<i>2</i>
Mining in Mongolia	3
Climate change and natural disasters in Mongolia	5
Livelihoods-climate disaster-mining nexus: evolving risks and opportunities	8
Current policy and legal landscape in Mongolia	9
<i>b. Project purpose and objectives</i>	<i>15</i>
Methodology	17
Results & Discussion	20
Workshop findings (regional).....	21
Workshop findings (Ulaanbaatar)	25
Conclusions	27
Policy recommendations.....	28
Future Directions	29
References	30
Appendix 1: Glossary of Terms.....	33
Appendix 2: Workshop Agenda and Program	34
Appendix 3: List of workshop participants	45
Appendix 4: Funding sources outside the APN	51
Appendix 5: List of Young Scientists.....	52

Preface

This report presents results from an APN-funded project titled 'Can traditional livelihoods and mining co-exist in a changing climate: strengthening public private partnerships to reduce risk and address loss and damage'. Results and key findings outlined in this report are drawn from capacity building workshops undertaken across three sites in Mongolia in September 2014.

The project brought together representatives from various stakeholder groups including, but not limited to mining sector, herding sector, civil society, and local and national government agencies. The discussion at the workshops highlighted four key areas of policy reform, namely: disaster management; green development; changes to current herding style; and recognition of traditional herding knowledge.

Introduction

a. Background Information

Since transitioning to a market economy, Mongolia's large share of traditional pastoralist communities have struggled with restricted water availability, largely due to extreme weather conditions, poor service delivery, and limited government intervention to address some of the underlying causes of water-related community concerns. As explained in further detail below, an expanding mining industry and its water-intensive activities together with a looming climatic (dis)order present Mongolia with complex bio-physical and socio-economic drivers of change. These changes interact with, and influence one another and challenge the existing social, cultural and institutional fabric of local communities and cause irreversible Loss+Damage (L+D). The fact that communities possess neither the capacity nor the resilience needed to address these complex climatic challenges further reinforces the need for a project that transcends sectoral boundaries to address disaster risks and resulting L+D.

Dialogue, coordination, coherence and synergy among relevant stakeholders have been considered key instruments to strengthen risk management approaches to address L+D. In relation to building capacity to address L+D, the significance of better appreciating non-economic losses and the impacts of slow-onset processes such as desertification and loss of biodiversity can hardly be underestimated, particularly for economic enterprises such as herding and mining which are so integrally dependent on suitable environmental conditions for their long-term viability.

On the one hand, climatic changes – both slow onset and extreme events – have severely impacted the livestock sector in Mongolia, resulting in devastating losses and damages of herder livelihoods across the country, particularly over the past two decades. More than 70% of total pastureland is subject to overgrazing and desertification. The adverse impacts of climatic changes negatively impact economic, social and psychological wellbeing of rural communities.

On the other hand, in recent years, the Mongolian mining industry has grown to contribute approximately 30% of GDP and over 85% of export value, becoming a key engine of economic growth. The interaction of mining and pastoralism in a changing climate is currently discussed within policy discussions as a mere juxtaposition: two sectors competing for critical resources such as land and water. However, despite these negative aspects, research on mining and development identifies a number of positive externalities of mining on addressing L+D among pastoralists and rural households through enhancing adaptive capacity and collaborative disaster risk management. Mining has provided alternative livelihood opportunities for pastoralists who lost their animals during extreme events. Furthermore, demographic pressures and overgrazing on lands vulnerable to L+D can be protected more easily when herders have alternative livelihoods. While the herders maintain generations of rich traditional knowledge about the local climate, topography and animal husbandry, mining companies are well resourced and have access to latest technology and R&D. Together they can therefore work to building a Mongolia that is more resilient to climatic perturbations and resulting L+D.

There is broad consensus in the literature regarding current high vulnerability and insufficient climate change adaptation of nomadic pastoralists in Mongolia. It also argues that mere improvements in disaster preparation and enhancing the adaptive capacity of individual herder households will only be partly successful in facilitating more resilient pastoral lifestyles. For rural livelihoods to be resilient and long-term viable requires raising awareness and building partnerships among a broad range of stakeholders. The latter is possible by strengthening linkages and building synergies across public-private-civil society sectors through promoting awareness and developing resources for collaborative planning and risk management.

Mining in Mongolia

Since Mongolia's transition to a market economy and subsequent government prioritisation to develop its minerals sector, international interest in the country's socio-economic, environmental and geo-political functioning has steadily increased. From being a country where 'known reserves [we]re modest and ... [did] not enjoy a superabundance of currently exploitable natural resources' a decade ago (Fish, 2001, p.325), Mongolia's strategic and market value has grown enormously at the international scale. It is widely recognised as a country with vast resources of copper, coal, gold, fluorspar, uranium and other natural resources – 12 large mining operations are located across the country and nine more are set to begin operations in the near future (Austrade, 2011) (for mining hotspots, see Figure 2 above). Mongolia's GDP grew by approximately 17.3% in 2011, a direct result of large-scale mining investments, particularly in the South Gobi region (UN Stats, 2013). Latest census reveals that the two major mining centres in the South Gobi, Khanbogd and Tsogttsetsii, both have witnessed an exponential growth in their population between 2000 and 2010 (Ochirsukh, 2011). In 2012, mining accounted for approximately 9% of all new employment opportunities created in Mongolia (Dalaibuyan, 2013).

Further, subject to China's ongoing demand for minerals, current trends project that Mongolia's GDP will continue to double every two years for the next ten years (Fincenter, November 2011). The minerals sector already employs in excess of 14,000 people and contributes to more than 70% of Mongolia's total export earnings (Austrade, 2011). Oyu Tolgoi (OT), besides being the world's largest copper mine, is expected to contribute to approximately 34% of Mongolia's total

GDP once fully operational by 2020 (Dalaibuyan, 2013). It is not surprising then that a study of poverty and inequality in Mongolia undertaken by the Asian Development Bank suggested employment in the mining sector as one of the significant factors reducing the likelihood of poverty both at household and individual levels (Ochirsukh, 2011).

As a long-term economic enterprise, mining is paradoxical for Mongolia's future development. It threatens to upset Mongolia's unique biodiversity, cultural heritage and traditional economic structure based on livestock herding (Combellick-Bidney, 2012; Sternberg, 2012; Upton, 2012). Reeves (2011, p.467) argues that 'mining...remains the country's main source of environmentally harmful economic activity ... its environmental consequences are so acute that whole rural areas have become essentially uninhabitable'. Amidst the many dilemmas and opportunities that resource development presents for long-term sustainability, two challenges are particularly noteworthy due to their implications on the Mongolian way of life founded on a complex, but important 'custodial relationship with land' (Upton, 2009, p.1402).

Firstly, the nature of relationship between the industry and rural, remote communities holds great significance in the Mongolian context. Given Mongolia's almost exclusive dependence on pastoralism thus far, water availability (quantity) and quality in an arid landscape is vital to the survival of rural communities (Sternberg, 2008). Desertification in Mongolia currently affects '44% to 90% of the country's territory' (Reeves, 2011, p.456). With an expanding mining industry and its water-intensive activities, not only is there going to be a greater demand for water industry-wide but based on experience in other regions, there is also a real possibility for minerals development to negatively impact the quality of Mongolia's already challenged water sources (Combellick-Bidney, 2012; Hart, Greenfield, & Pascoe, 2008; Tiwary, 2001). Resulting impacts of any magnitude on pasture availability may thus become a potential source of long-term conflict between various actors operating in the region (Austrade, 2011; Upton, 2012; Wang et al., 2013). The latter may, in turn, inform people's perceptions in a way that could cause irreparable damage to the industry's social license to operate in Mongolia (Lawson & Bentil, 2013).

Secondly, in light of Mongolia's already high rates of rural to urban migration, mining may further encourage this trend by providing improved – often perceived – opportunities for employment and skills development in mining-focused larger urban centres. On the one hand, greater minerals revenue and investment may cause urban centres to expand that will result in an increased rate of unidirectional migration of young, healthy Mongolians to urban areas seeking employment in non-herding jobs; currently, 53.4% of Mongolia's total migrants are youth aged between 15 and 29 years (Ochirsukh, 2011). This trend of young emigration from rural areas may not only have acute repercussions for human capital-intensive traditional pastoralism but also increase socio-economic dependency upon mining, thereby contradicting Mongolia's core value system that thrives on peoples' deep connection with their lands (Upton, 2012).

Furthermore, although from a conventional viewpoint, mining-led economic boost to the national economy may be considered as one of the early signs of development in Mongolia, economic growth alone that disregards resulting impacts on the country's socio-ecological way of life contravenes the overarching Mongolian identity – demonstrated by Mongolians' deep concern for the environment and their extensive reliance on natural resource-based traditional

herding lifestyles. The following argument by Combellick-Bidney (2012, p.295-6) best captures the spirit of resource development and its importance for Mongolia and its people:

Due to its centrality in the politics of place, mining became a symbolic and material manifestation of a wide range of development issues that remain unresolved in Mongolia. They range from democratic governance (transparency, consultation and information access) to equality (share of profit, civil society involvement in profit allocation), from environmental preservation (local and ecological efforts) to economic viability (economic stimulus, domestic and foreign investment, domestic development of technological capacity). In short, mining brings up the full range of short- and long-term development questions affecting Mongolia's land and people.

Despite the many challenges that lie ahead, scholars argue that 'Mongolia stands at the cusp of a process that could have a transformative effect on the economy and prosperity of the state' (Wachman, Fall 2010, p.594). The potential of mineral resources to deliver meaningful socio-economic development and change in both rural and urban Mongolia remains under-explored, particularly in light of Mongolia's other challenges, most striking among which are changes to natural environmental conditions. An increasingly variable climate, already considered one of the biggest challenges facing Mongolia's social, economic and environmental wellbeing, will influence this process of transformation in a complex inter-connected way. The following section explores this in further detail.

Climate change and natural disasters in Mongolia

Mongolia's climate, impacts and consequences

According to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

Mongolia is very sensitive to climate change because of its geographic location, fragile ecosystems and environment-weather dependent socio-economic circumstances. Climate has played an important role so far in shaping Mongolia's past and present, and will continue to do so in light of the intricate dependence between the Mongolian herders and natural climatic conditions. Currently, approximately 80% of the total national territory is considered extremely vulnerable to climate-influenced disaster events (ADB, 2014). Historically, Mongolia has experienced high natural climate variability with significant inter-and intra-annual and daily variation in temperature and extremely low rates of precipitation (Tachiiri et al. 2008). Throughout Mongolia's past, there have been recurring instances of natural disasters, commonly known as dzuds that typically result when intense summer droughts are followed by harsh, extremely cold winters (Lioubimtseva and Henebry 2009; Wang et al.2013).

In the last forty years, Mongolian ecosystems have been noticeably altered by increased variability and changes in global climate conditions. Statistically, Mongolia's annual mean temperature has increased by 2.07°C between 1940 and 2013 (MARCC 2014). This is a much greater rate of warming than has been observed in global average temperatures, which increased by 0.74°C from 1906 to 2013. Since 1961, the annual potential evapotranspiration rate has increased by 118.1 mm and growing season precipitation has decreased by 33 mm due

to climate change, leading to severe aridity and desertification. Furthermore, periods of bare soil without snow or vegetation have been prolonged due to the snow cover melting up to one month earlier. As a result, soil erosion caused by wind as well as the number of dust storm days have increased significantly since 1960. Deterioration of the snowcaps in high mountains and thawing of permafrost has also been observed. For instance, the snow covered areas of Kharkhiraa, Turgen, Munkhkhairkhan, Tsambagarav and Sair mountains decreased by approximately 30 per cent between 1999 and 2002 (MARCC 2009). Hundreds of springs, ponds and lakes have dried out; pasture production has declined and biological diversity has decreased due to increased dryness.

Overall, key observed climatic changes that have resulted in a suite of follow-on impacts for Mongolia's longer-term socio-economic development include: increased desertification, more frequent droughts and dzuds, increased scarcity of water resources and greater biodiversity loss. Due to rapid rates of pasture degradation and an increase in the total number of extreme hot days annually, animals are unable to gain enough weight and energy to survive harsh autumn and winter months, resulting in severe weight loss and declining resistance to dzuds.

In particular, the occurrence of hazardous weather events has increased and the socio-economic losses associated with these events has roughly doubled in the last 20 years. According to latest 12-year studies, climatological disasters accounted for 70% of all hydro meteorological disasters while forest and wildfire account for approximately 99.7% of climatological disasters. Forest and wildfire occur about 160 times per year while other hydro-meteorological extreme events occur about 51 times per year. Among extreme weather events, severe windstorm and drought are the most destructive, having a significant impact on livelihoods. The number of weather related disasters in Mongolia has doubled in the last decade when compared with their frequency in the decades before (Myagmar and Chuluun, 2013). This includes an increase in the frequency and intensity of dzuds, particularly in the last two decades, causing 'mass debilitation, starvation, and death of livestock ... [thereby damaging] the livelihoods of the herder households who depend upon them' (Tachiiri et al. 2008). It was, however, the intense and tragic events of 1999-2002 and 2009-10 that highlighted the complex climate-livelihoods nexus in Mongolia and the serious consequences for its herding communities that continue to remain vulnerable to a life consumed by an uncertain natural environment. From 1999 to 2002, a succession of *dzuds* followed by summer droughts killed 30% of all livestock in Mongolia. The dzud of 2009-10 resulted in an enormous loss of livestock populations across the country, about 8.5 million livestock or approximately 20% of the country's livestock population perishing during the event. The dzud affected 769,000 people or 28% of Mongolia's human population, and according to the Red Cross, 220,000 herding households were affected of which 44,000 households lost all their livestock and 164,000 lost more than half their herd (Tachiiri et al. 2008; UNOCHA 2010; Fernandez-Gimenez et al. 2014). The loss of livestock, in turn, spiralled into a series of socio-economic and ecological crises across Mongolia, particularly in rural remote areas (Wang et al. 2013).

To provide context to the rationale behind the choice of particular aimags for this project, below we outline some of the key natural disaster events experienced in the two aimags chosen for workshop discussions – Omnogovi and Bayankhongor – and Ulaanbaatar city in Mongolia over the last two decades.

Climate disasters in local areas of interest for the project

Mongolia has nearly 20 types of natural disasters, with average extreme events occurring up to 51 times per year. Major disasters can be ranked by social-economic risks as follows: drought, dzud, forest fire, dust and snow storms, floods and cold surges.

Dzud events in Bayankhongor aimag

The dzud, or great storm, of the early 2000s devastated Bayankhongor and it took years for the aimag to replenish its livestock. The dzud also forced social change in the aimag since fewer people now rely on herding as a major source of income and more people have moved to the aimag centre to work or at least stay warm.

Floods in Bayankhongor aimag

- On June 8 1996, extremely intense rainfall was recorded: approximately 44 mm rain fell over a span of a few minutes.
- Floods were also observed between 14 and 17 August 1997 in Bayanlig area of Bayankhongor aimag.

Flood events in Ulaanbaatar

Ulaanbaatar city was built in the wide valley of River Tuul, and in later stages of the city's development has expanded to the top of the hills of the four mountains. This specific feature of the city has an effect on rain distribution and intensity, as well as impacts from lightning and wind storm. The water accumulation area of the rivers, creeks and dry beds between the four mountains that surround Ulaanbaatar is flake alluvial. UB's territory has been declared as heavy flash flood zone. The average annual precipitation is 258.8 mm in Ulaanbaatar.

- In 1915 there was a big flood along the Tuul river and flood water reached along the bottom slope of Zaisan hill, and the popular Gandan temple area.
- One of the biggest rainfall events recorded in the modern era was in 1966 in the Tuul river basin. Between 10 and 11 July 1966, Ulaanbaatar area recorded 103.5 mm rainfall that was about 43 percent of total annual precipitation. Due to this rainfall Tuul and other small tributaries of the river as Selbe, Uliastai rivers were flooded, causing severe inundation of the surrounding area. Floodwater velocity reached 4-5 m/sec, flood discharge was 1700 cubic meter and water level rose to 151 cm within less than 2 days.
- Another flash flood event was recorded for UB city on August 15 1982, when intensive rainfall fell for just under half an hour and 44 mm (84 % percent of monthly sum) was recorded. Due to this intensive rain there were huge flash floods along the 42 dry beds and small rivers around Ulaanbaatar city, mainly from the northern end. As a consequence, several human deaths were recorded and a huge impact on the city's economic functioning was felt over several coming months.
- Floods were observed on June 8 1996 and from August 14-17 1997 in Ulaanbaatar, and surrounding areas of Tuul river.

Drought events in Umnugovi aimag

Winter and spring of 2000-2001: Spring and summer of 2000 was dry and more than 60% of country's territory was declared under a heavy drought. As a result, pastureland in Gobi and steppe area suffered a hug impact. Most soums within Umnugovi aimag had poor vegetation with limited fodder availability for livestock. Hydro-meteorological service, local governors and

herders were considering the ongoing drought to have huge repercussions for the winter months. The 2000-01 winter dzud was one of the most significant and devastating dzud events in Mongolia's modern history.

Livelihoods-climate disaster-mining nexus: evolving risks and opportunities

Approximately 40% of all Mongolians are currently involved in herding for their primary livelihood (UN Stats 2013). History has played an important role in shaping pastoralism as an economic enterprise in Mongolia; a strong pastoralist past provides Mongolians with a strong cultural identity rooted in the philosophy of co-existence with land. Mongolia is grappling with a number of challenges that threaten its long-term social and human security. Geo-political pressures from neighbouring Russia and China; market-led forces of globalisation and ongoing volatility in mineral commodity prices; an increasing occurrence of more intense natural disaster events; and limited capacity within the herding communities to maintain resilience to both internal and external drivers of change are issues at the heart of Mongolia's sustainability conundrum. Albeit in different ways and at different times over the past two decades, each of these factors has influenced Mongolia's traditional lifestyles, and continues to play an important role in the way Mongolia's institutions address sustainability in the future.

As highlighted in the previous section, over the past two decades, climatic changes – both slow onset and extreme events – have severely impacted the livestock sector in Mongolia, resulting in devastating losses and damages to herder livelihoods across the country. In the most recent 2009-2010 dzud, 19 out of the country's 21 provinces were impacted with about 8 million livestock dead (Tachiiri et al. 2008, Sayed 2010, UNOCHA 2010). In living memory, the scale of livestock loss – affecting nearly 30% of the country's population – was unheard of and immediately highlighted Mongolia's unique context underlined by the close relationship between the land and its peoples and livestock. Impacts of such dzud events negatively affect the economic, social and psychological wellbeing of a large proportion of Mongolians every year (Sayed 2010, Wang et al. 2013).

Culturally, the health of the environment, including natural climate embodies a strong sense of emotional and spiritual connection across the Mongolian way of life. Loss and damage – both tangible and intangible – occurring due to disruption in natural environmental conditions may therefore have several enduring implications for human security. The latter is manifested across Mongolia's rural and urban communities in a range of biological, cultural, economic and spiritual capitals (Togtokh 2011). The accumulation, maintenance, and recovery of these capitals prior to, during and after a disaster event is vital to addressing long-term sustainability challenges that may surface as a result of extreme events.

For particular parts of the country, most notably the Gobi desert, local experts are advocating for developing a comprehensive understanding of what comprises natural and social capitals within these regions (Togtokh 2011). Improved knowledge of critical issues is expected to strengthen the effectiveness of appropriate government interventions and planning instruments to identify means of building resilience, both in the present and future, to address climate disaster-induced loss and damage to herder livelihoods and wider socio-economic quality of life (Taylor 2014).

At its core, Mongolia's traditional lifestyle built upon nomadic livestock herding, despite being the primary source of livelihood, remains under serious threat due to the presence of two broad

types of *drivers of change*: a) socio-economic change brought about by growing national and international interest in mining and resource development activities, and b) bio-physical changes occurring as a result of increasing climatic variability and change, thereby leading to desertification, water stress, and extreme *dzuds*. The indirect but important causal relationship between these two sets of drivers of change further accentuates the complexity underlying Mongolia's sustainability challenges. On the one hand, mining as a long-term activity has the potential to bring about large-scale transformation to the immediate physical landscape (Franks, Boger, Cote, & Mulligan, 2011). On the other hand, climate-related changes to bio-physical conditions may influence the course of resource extraction as the latter remains highly dependent on suitable natural conditions for accessibility to, and subsequent extraction of underground resources (Sharma & Franks, 2013).

This founded the premise of the present project as it sought to undertake capacity-building workshops in Mongolia to facilitate public-private-civil society partnerships to address loss and damage in rural areas through collaborative efforts to help local herders better manage future climate risks. These workshops focused on understanding how climatic changes that impact both herding and mining – although in varied forms – may provide the impetus to build trust and partnerships between the two industries to better manage climate risks and address loss and damage in affected rural communities. The next section provides more detail on the project purpose and objectives.

Current policy and legal landscape in Mongolia

Green Development Policy

Mongolia's Green Development Policy was adopted by parliament in June 2014.¹

The Policy states that “transition to a green development will be ensured by valuing benefits and rationale use of natural resources, increasing productivity, green investment and green procurement, expansion of works and services directed to enhancing conservation of ecosystem balance and restoration, engraining environmentally friendly production and services and green lifestyle.”

Key indicators for measuring progress of transition to a green development will include savings of natural resources derived from production and services, level of recycling, green employment and green procurement growth, reduction of usage of energy, water, greenhouse gas emission and ecological footprint per unit of production. The policy defines guiding principles for ensuring green development as:

- Efficient, effective and rationale use of resources;
- Sectoral policies and planning shall be consistent with green development concept;
- Promotion of clean and advanced technologies;
- Ensure citizen's participation in green economic growth;
- Engrain environmentally friendly attitude and habits/competence;
- Transparency, accountability and controllability.²

¹ <http://www.legalinfo.mn/annex/details/6438?lawid=10482>

² Green development policy of Mongolia. Unofficial translation.

<http://covermongolia.blogspot.com.au/2014/06/green-development-policy-of-mongolia.html>

³ <http://www.un-page.org/mongolia-kicks-off-development-policy-of-mongolia-unofficial-translation>

<http://covermongolia.blogspot.com.au/2014/06/green-development-policy-of-mongolia.html>

The key strategic objectives and means of implementation of the Policy that are highly important in relation to the co-existence of mining and traditional livelihoods in a changing climate are summarised in the following table:

Green development policy: objectives and measures on mining and traditional livelihoods	
Key strategic objectives	Means/measures of implementation
<ul style="list-style-type: none"> • Preserve <i>ecosystem balance</i> through intensification of environmental protection and restoration activities and reducing environmental pollution and degradation. • Introduce financing, tax, lending and other optimal <i>incentives for supporting green economy and increasing investments</i> to promote environmental protection, human development and clean technologies. 	<ul style="list-style-type: none"> • Introduce environmental standards and norms consistent with international standards and increase results/quality of environmental assessment while promoting competitiveness and increased productivity. • Increase the processing of agricultural raw materials, including animal skin, wool and cashmere to 60 and 80 percent by 2020 and 2030 respectively through promotion of sustainable agriculture development and development of green-tech, export-oriented manufacturing industry cluster. • Promote resource efficient and waste-less mining technologies • Prevent negative impacts on human health and environment arising from mining activities through establishing transparent and responsible mining practices, including those focusing on environmental protection, restoration and offset protection. • Apply the Wealth/Sovereign fund model to use mining sector income to ensure long-term sustainable development. • Develop environmentally sound infrastructure and transportation network that minimizes adverse impacts on human health and biodiversity. • Promote transformation of natural and cultural heritage sites into exemplar green development areas by limiting mining and industrial activities and developing eco-tourism and traditional livestock husbandry. • Limit the use of surface water for industrial purposes and promote the introduction of technologies for wastewater treatment that ensures waste water is treated to meet permissible standard levels for its re-use. • Promote research and development towards improving surface water restoration system and initiatives to store and use of rain water and projects on creation of river basin. • Strengthen public resilience to negative impacts of climate change by implementing projects and programs aimed to diversify livelihood opportunities for citizens dependent on biodiversity and natural resources.

	<ul style="list-style-type: none"> • Create incentives such as ecosystem payment services for herders with initiatives directed to prevent pasture degradation by managing livestock farming adapted to grazing capacity in remote areas. • Undertake comprehensive risk assessment and preservation analyses for environmental, historical and cultural heritage prior to implementation of large mining operations and development projects.
--	--

Some of the early results of the Policy are:

- Transfer “tax for environmental use” to local government. Up to 50% of the tax can be allocated to environmental protection activities.
- Government resolutions 326, 327. Increased price of water for production purpose, and provision of incentives for water savings. As a result of these resolutions, a total of 73 million tonnes of water was recycled and re-used in 2014.
- A successful MoU signed between the Mongolian Banking Association, Ministry of Environment, Green Development and Tourism (MEGDT), Bank of Mongolia and Mayor of Ulaanbaatar City to implement Sustainable Financing program (Bulgan 2015).

Government recognizes a strong environment of public and private partnership as one of the key priorities for implementing the Green Policy successfully.³

Policy on disaster management and Loss and Damage

Draft Law on Disaster Management

The Law on Protection from Disaster was approved by Parliament in 2003. Since then it has been amended five times, reflecting the gaps between national policies and international practice. Government prepared a draft new law in April 2015 and it is expected to be discussed by Parliament. This is in conjunction with the ‘Sendai Framework for Disaster Risk Reduction 2015-2030’ (SFDRR), the first major agreement of the post-2015 development agenda during the Third UN World Conference on Disaster Risk Reduction (WCDRR) held in Sendai, Japan in March 2015. Governments adopted a political declaration, which expresses the commitment of Heads of State and Government to implement the Sendai Framework; and a resolution regarding voluntary commitments of stakeholders, inviting further commitments and the creation of partnerships to implement the Framework. In order to strengthen disaster risk governance to manage disaster risk, the framework calls on governments and stakeholders to actively engage in the Global Platform for Disaster Risk Reduction, the regional and sub-regional platforms for disaster risk reduction and the thematic platforms in order to forge partnerships, periodically assess progress on implementation and share practice and knowledge on disaster risk-informed policies, programmes and investments, including on development and climate

³ PAGE. 2015. Mongolia kicks-off national green economy week. <http://www.un-page.org/mongolia-kicks-national-green-economy-week>

issues, as appropriate, as well as promote the integration of disaster risk management in other relevant sectors.⁴

The new draft law states three main objectives:

1. To reform legislation to improve the integrity, effectiveness and responsiveness of the national disaster management system
2. To ensure the current legislation and policies accord with international standards and good practice
3. To improve the coordination and integrity of government organizations designated for national security and disaster management.

The draft law also clarifies the provisions in the National Policy for Protection from Disasters that states that the government will determine the roles and responsibilities of private sector entities in disaster management. The draft law aims to put the main focus on disaster prevention and preparedness and determine the relevant roles and coordination. It also contains provisions on post-disaster recovery measures and the contribution from the private sector and other stakeholders. It proposes to establish the National Committee or Platform on Protection from Disaster and its local committees at the sub-national and local levels.

Participatory Disaster Management Program

The National Emergency Management Agency developed a draft Program on Participatory Disaster Management and its Action Plan, and the first meetings among the organizations dedicated for disaster management were held in October 2014. The objective of the program is to enhance participation of public and local community in disaster risk reduction, to improve their capacity to understand and act on natural disasters and climate change impacts, to build local disaster management partnerships, and to improve local resilience through activities such as public-private collaboration and technology sharing.

Policy on development planning and stakeholder participation

Draft Development Planning Law (DPL)

The draft Development Planning Law (DPL) was submitted to the Mongolian parliament in October 2014. The main objective of the law is to develop a legal framework for well-coordinated national development policy-making and implementation to enhance long-term development. In the period between 1991 and 2013, Mongolia produced 480 policy documents that planned to be implemented in the short, medium and long terms. Of those, approximately 190 are valid at the present under different names such as policy, program, strategy and plan. The DPL is a measure to integrate development policy-making. While the draft may have wide support within Parliament, the final content and clarity of the regulation are under discussion. The guiding principles of development planning under the draft law are:

1. Engage different stakeholders in national development planning
2. Ensure political party platforms are consistent with national priorities
3. Ensure consistency of inter-sectoral and national-local policy planning
4. Enhance consistency with financial resources required for development plans
5. Develop regional development policies in cooperation local governments
6. Coordinate development planning through designated government agency

⁴ ISDR Asia Partnership (IAP) meeting of 2015. <http://www.unisdr.org/we/inform/events/44120>

The Integrated Budget Law and Local Development Fund (LDF)

The Integrated Budget Law came into operation in Mongolia in January 2013. It included the establishment of a 'General Development Fund' (GDF) and 'Local Development Funds' (LDFs). The national-level GDF accumulates funds from a variety of sources including 100% of royalties on major minerals and the license fees collected on mining and exploration leases. Funds are then annually distributed to aimag- and soum-level LDFs based on a formula that takes into account local population numbers, local development indices, population density, remoteness and territory size, and local taxation effectiveness.

Local Development Fund (<http://tusuv-oronnutag.mn/>)

The LDFs are established under the Budget Law. The methods of revenue raising and governance are explicitly defined in the Law. Moreover, the LDFs cannot direct funds to:

- recurrent social services and purchases,
- meet political party or NGO expenses,
- cover holidays, celebrations, anniversaries, religious or cultural ceremony costs,
- pay for loans, warranties with financial risks,
- cover activities that do not meet public interests, and
- cover activities that are not based on community opinion, included in local budget planning.

Furthermore the selection of LDF-funded activities and disbursements must follow a procedure that actively seeks citizen views at bagh level, and 'rolls up' priorities to soum level through local polling. Mongolian laws on public disclosure, tendering and audit will be enforced.

Let's take Galuut Soum of Bayankhongor Aimag as an example. In 2014, approximately MNT 14 billion was allocated to Bayankhongor Aimag LDF, and it was then distributed to its soums. MNT 576 million was budgeted for Galuut soum in 2014 but it only received MNT 165 million due to the national revenue constraints. Some of the projects implemented using the first round of LDF funding included:

- Local central-heating system renovation and expansion
- Local community development centre building
- Construction of wells
- Local cadastral map
- Headwater protection facility
- Street lighting
- Mobile-phone network receiving facility
- Research on local herd quality improvement
- Improving internet connectivity
- Consultancy on soum development plan⁵

Citizens' Halls

In December 2009 the President of Mongolia, Elbegdorj Tsakhia formally opened the Citizens' Hall.⁶ This public hearing forum is located in the capital, Ulaanbaatar, and is designed to

⁵ <http://tusuv-oronnutag.mn/>

encourage civil participation in the planning and decision-making process. Whilst the citizens in the Citizens' Hall do not have any law making powers, it serves to forge citizen engagement through a consultation procedure. Four months after the Citizens' Hall opened in Ulaanbaatar, it was suggested that the concept of the Citizens' Hall be exported to the provinces (Failor 2010). Therefore in April 2010, the Darkhan-Uul province became the first area outside of the capital to stage its own Citizens' Hall. To date, all provinces have Citizens' Hall and it operates under the Local Citizens' Representatives Khural. As well as formal draft legislation discussions, the Citizens' Hall also holds events that focus on the wider aim of increasing the quality of deliberation among Mongolian citizens. There are also motions that are given extra emphasis from government to include marginalised groups. For example, a platform with education ministers allowed students to discuss how education policy could be improved.

Mining sector policy landscape & initiatives

Responsible mining

The eight principles of responsible mining, which were a result of a series of multi-stakeholder forums in 2006-2007, have been adopted by many mining companies and the key industry associations in Mongolia. Responsible mining is introduced in key government policy documents and regularly discussed at mining forums. The application of these principles in practice varies among companies. The term responsible mining has been contested and overused; unless verifiable reporting and assessment arrangements are put in place it can lose its meaning. Further discussions on these principles need to focus on detailed performance guidelines. Some mining companies in Mongolia have started to publish their Sustainability Reports which inform their stakeholders about the company's economic, environmental and social impacts. Embracing this initiative other companies can also use it to report about its commitments to responsible mining.

Good practice

The leading companies and industry associations can have an important role in disseminating norms and good practice to change the mining sector for sustainable development. Some leading global mining corporations operational in Mongolia have had a leading role in transferring knowledge and best practices of responsible mining. Industry associations have so far focused on advocating for policies to create better business environment but had limited engagement in promotion of norms and behaviour of responsible and sustainable mining. For example, building the baseline knowledge of socio-economic and environmental conditions of mining affected areas is an important task of governments and resource companies. It allows them to track changes in the future and assess the impacts of the mine project in a systematic way. Anglo American Plc, one of the largest mining companies in the world, has recently translated its well-recognized socio-economic assessment toolbox (SEAT). The company introduced the toolbox in 2003 and has required all its projects to conduct socio-economic assessment every three years and develop follow-up socio-economic strategic plan (Anglo American, 2014).

Another example is Oyu Tolgoi's environmental monitoring programme. The company commenced an environmental monitoring programme in 2003. Since 2010, the company has expanded its monitoring to include a participatory element. This means involving local people

⁶ Participedia. 2013. Citizens' Hall Mongolia. <http://participedia.net/en/cases/citizens-hall-mongolia>

in the activity to ensure that the monitoring processes and outcomes are open and transparent to the community. The programme allows local people to volunteer to take part, providing local citizens and herders with the opportunity to be part of the process of managing environmental issues.

Some company-community investment programs have sought to minimise the negative impacts on the environment. For example, in the past companies have initiated pasture management and tree nursery and planting development programs 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. For example, the UHG Company has previously paid herders to manage and monitor sections of the coal road. Herders were paid a monthly stipend to keep the areas clean and report any incidents.

Environmental Impact Assessment

The 2012 Environmental Impact Assessment Law reflected aims to improve requirements for companies and government authorities regarding transparency and public participation in the mining approvals processes. It contains a section on public participation specifying information disclosure and consultation requirements for strategic EIAs and detailed EIAs. Following the law, the government in January 2014 approved a detailed procedure for public participation in the EIA processes.

Amendments to taxation legislation

Amendments to the Taxation Law were made in April 2015 to increase the share of economic benefits of local mine-affected areas. By law, 30% of royalty and other payments from mining will be distributed to local areas where mining activities are occurring. The strategic, mega projects are excluded. This additional budget allocation will be important for local governments to better mitigate the impacts of mining.

b. Project purpose and objectives

The proposal acknowledges mining not only as the emerging economic enterprise in Mongolia – one that offers immense socio-economic promise for development – but one that is closely dependent on a suitable natural environment for its operations and long-term viability. With a changing climate, the demands for water and land by both herders and miners are going to increase as their supply and or quality shrinks. Rather than competing with each other, the project emphasised upon the synergies that could be developed between the two sectors to build collaborative adaptive capacities and address Loss and Damage. In doing so, the project presented a novel approach to bringing together two of Mongolia’s key economic sectors – mining and herding – that have so far been in conflict over access to land and water resources, to: a) work in collaboration with various levels of government and civil society to identify risks from climatic changes and, b) build capacity to adapt to these changing conditions with a view to reducing the resulting loss and damage through both incremental and transformative changes.

The workshops focused on brainstorming key multiple stakeholder concerns including, inter alia, current and potential risks from CC, local stakeholder priorities, knowledge gaps, take stock of current knowledge, resources and instruments, develop practical implementation and

partnership-building plans, and a future plan of action. Specifically, the project had the following five objectives:

1. Identify impacts of climate change on key sectors, including mining, herding, and civil society activities;
2. Identify current capacity within each sector to deal with these impacts;
3. Identify priority impacts and outline specific activities that can be undertaken in a collaborative manner for each impact;
4. Identify main barriers to collaboration; and
5. Identify ways to overcome these barriers – how, what and by whom can support be provided to overcome barriers.

To achieve these objectives, the workshops undertook the following activities: a) Map existing capacities of private and public institutions to undertake disaster risk reduction; b) Identify opportunities for collaboration and building synergies to address local climatic risks and prevent, where possible, resulting loss and damage and; c) brainstorm ideas for the establishment of a knowledge hub of information on climatic impacts on herders and mining communities; traditional response mechanisms to address these impacts, including application of local indigenous knowledge; and existing awareness of Disaster risk reduction strategies and institutional sources of support to address loss and damage;

Methodology

The project undertook three workshops representing herding groups, mining companies, local, provincial and national government, academics, media and civil society. These workshops were organised between 14 and 30 September 2014. Two workshops were at the local/regional level (Omnogovi and Bayankhongor aimags in the Gobi and Gobi-Altai regions respectively) followed by a concluding multidisciplinary workshop in Ulaanbaatar. The final workshop in Ulaanbaatar brought together representatives from Mongolia’s academic and consultancy-based researcher community, mining industry, civil society and government sector, including ministries of mining, agriculture, livestock, health, education, disaster and natural hazards, and planning. Findings from the regional workshops informed the final workshop to identify both short and long-term policy concerns and possible solutions.

The following table provides some detail on the participant composition of the two regional workshops:

Table 1: Workshop participant distribution

Participant groups	Umnugovi workshop	Bayankhongor workshop	Ulaanbaatar workshop
	18 Sep 2014	24 Sep 2014	29 Sep 2014
Herders	6	8	2
Large scale miners	12	2	8
Artisanal miners	-	4	
Civil society	9	6	12
Media/international	2	-	4
Local, aimag and national government	12	15	9
Research institutes			4
Total participants	41	35	39

Appropriate participants for the research were chosen on the basis of the 1) level of impact experience from mining activities and climate change; 2) extent of knowledge in the extractive industry and regional development to inform research and 3) the level of influence in decision-making. Participants were selected as data-rich sources using purposeful rather than probability or random sampling. Participant selection was established firstly through in-country partners as well as via information in the public domain such as media reports, government ministry websites, community organisations and companies, publications such as community directories, and submissions made in response to the Environmental Impact Statements of major projects in the region. Special guidance was sought from advisory members suggested by the APN and expert contacts of the project’s in-country team. Snowballing technique was further applied to include networks from these initial contacts and achieve an equitable representation from key stakeholder groups.

Selected participants were spokespeople or contacts of these groups and were initially contacted informally (usually by phone or email). Subsequently they received official written communication from the university that described the research and invited their participation.

The information indicated that participation was voluntary (in accordance with the University’s Ethical Guidelines) and provided the primary researcher’s contact details to allow potential participants to raise any queries. The written invitation was subsequently followed up by telephone (or email) contacts to confirm their availability and make travel and boarding arrangements to facilitate their participation in the relevant workshops(s).

Discussion at the workshops was organised in three group activities; the first activity was undertaken with groups made of same sector representatives (e.g. all herders were in one group, all large scale miners in another group etc.) while participants were mixed up for the second and third activities such that each group had a fair representation (and therefore, a reasonable voice) of all stakeholder groups.

Each group activity targeted a particular question, or a set of questions that aligned with addressing the projects objective outlined earlier. The questions followed the ‘what, why, how’ order to allow participants to gradually move from simple to layered questions and ensure they were comfortable before addressing questions that were more complex in nature and required a greater level of deconstruction of thought, content and analysis.

Table 2 below provides more detail on the flow of each workshop, with the flow for the last two workshops tweaked slightly in light of experience drawn from the first workshop.

Table 2: Workshop discussion flow

Activity	Order	Key questions addressed
Activity 1 (Participants organised in Sector-specific groups)	WHAT	Identify impacts from mining and climate change on your sector How do you currently address these impacts Identify impacts from climate change on your sector and current capacity to address these impacts Also, identify impacts of climate change on other sectors and what their current capacities may be to address these impacts
Activity 2 (Participants organised in mixed groups)	WHY	Identify two or three priority impacts from the previous activity Suggest specific activities for collaboration for each priority impact Identify what barriers exist to these collaborative activities?
Activity 3 (Participants organised in mixed groups)	HOW	What support mechanisms, tools, policy instruments would you require to overcome these barriers? And from whom?

Deliberations from each regional workshop have been synthesised to produce factsheets (in Mongolian) that will be widely disseminated throughout the region with help from local aimag offices and in-country partners. Each factsheet has been organised in a) current and future challenges; b) local needs and priorities; c) existing capacity; d) sources and measures of external support; and e) timeframe for action. The help of local collaborators, media and

regional civil society bodies is being sought to maximise uptake of these factsheets. The factsheets also include a set of policy recommendations to enable cross-sectoral cooperation and partnerships to build capacity at all governance levels to address climatic risks and manage L+D resulting from climatic events. Our local partners are seeking to embed these policy recommendations in the policy priorities and action plans of key government agencies and industrial bodies. Furthermore, the project team is aiming to engage the private sector and other stakeholders to organize next series of workshops in the future, creating opportunities to assess the implementation of the recommendations and plan further actions. To this extent, the project is expected to serve as a start-up for long-term collaboration between CSRM and its Mongolian partners. CSRM already hosts a Mongolia Hub on its website, which is being currently used to upload findings from the workshops for further dissemination.

Results & Discussion

Mongolia is facing a difficult challenge to develop economic growth policies for enhancing sustainable development goals because the extractive industries have been increasingly becoming the main driver of its economy while the one third of national population is reliant on mobile pastoralism that is deeply connected with the country's vulnerable ecosystem. According to a recent research study, if there is a steady growth of mining sector in the coming years (5-10) approximately 200-250 active mines may operate in Mongolia. If managed properly, they will have significant economic benefits. However, it is important to develop and implement policies to minimise their impacts on the environment and local livelihoods and existential security.

Nearly 40% of the country's territory was allocated to minerals exploration and mining in 2005. The past decade has witnessed a series of policy changes to reduce the size of land for minerals exploration and mining and define the no-mining zones to protect the vulnerable ecosystem and local traditional livelihoods. Under strong public pressure, the Government of Mongolia has amended key legislatures and policies on environmental assessments and approvals of mining. By 2014, approximately 13% of the country's territory was issued exploration and mining permits. The mining permits cover 0,5-0,6%, and active mine sites constitute less than 2% of them. Impacts of mining have thus concentrated in some local areas. In few cases like Umnugovi, Selenge, Tuv and Bayankhongor, cumulative impacts of different types and scales of mining can be observed. For example, mining has been concentrated in three soums (Tsogttsetsii, Khanbogd and Gurvantes) in Umnugovi and could have collective region-wide impacts. In Selenge and Bayankhongor, there are mining areas where formal mining co-exists with informal artisanal and small-scale mining. The co-existence of mining and traditional livelihoods has become an inevitable reality for many mining areas in Mongolia. In some areas, their relations are adversarial because of the environmental and social risks and impacts caused by mining. In some areas, they are synergised in different ways such as multiple employment or livelihood opportunities, company-community partnerships, and community-based ventures.

The interconnection between mining, traditional livelihoods and climate change has not been addressed often by research institutes and government agencies in Mongolia. Nor the mining and other economic sectors have raised this issue for broad discussion. In fact, when Civic Solutions first approached some mining industry representatives to discuss their interest in this issue many of them were very keen to learn and promote the project. It was clear that the whole scholarly and policy discourse in Mongolia on climate change adaptation and mitigation and L+D has not considered fully the role of mining in a positive way. The question of impacts of climate change on mining itself was totally absent in it.

The mining industry in Mongolia has received dominant negative feedback in the press over the past decade mainly for its real and perceived environmental impacts. Thus, a discussion about the role of mining in climate change adaptation and mitigation cannot be encouraged promptly by different stakeholders. Public trust towards mining companies is among the lowest in economic sectors.⁷ There is growing demand for improving resource governance in Mongolia.

⁷ American Chamber of Commerce in Mongolia (2014) Nationwide Survey Results on Mongolian Business Environment. <http://amcham.mn/amcham-mongolia-releases-nationwide-survey-results-on-mongolian-business-environment/>

Local communities and civil society are increasingly demanding the distributional and procedural fairness of impacts and benefits, which means broad-based informed and prior consultation, strong accountability and long-term socio-economic benefits. In this situation, Mongolia has been successful in incorporating some international best practices of resource governance into its legislation and policy frameworks, and it has developed the key policy instruments for green development and public-private partnerships. Furthermore, there are emerging instances of bottom-up multi-stakeholder and public-private partnerships in Mongolia where companies and local communities share with local governments the responsibility for managing local-level impacts and benefits of mining through a collaborative and participatory way. The implementation and effective application of these and other hard and soft rules by relevant stakeholders, and development of new broad partnership platforms are a key to effectively locating the issue that we raised in this project in Mongolia's current and future policy landscape.

In light of the observations made above, this project entailed capacity building workshops that sought to address the following policy questions: a) What are the key perceived economic as well as non-economic/ non-insurable impacts of climate change on herders and mining operations in Mongolia?, b) What are some of the factors to which these impacts are attributed?, c) What good practices and cases can be identified where mining companies may have collaborated with other economic sectors in the past to increase resilience, manage climatic disasters and address L+D? What lessons may be learnt from these good practice cases?, and e) What mechanisms, processes, and support tools at a policy level can help create synergies and partnerships between the mining sector and other stakeholders to manage L+D

Workshop findings (regional)

Below we present findings from the two workshops conducted in Umnugovi and Bayankhongor aimags where each of the above policy question was discussed in groups once in groups formed of representatives from the same sector, followed by mixing up participants in a multi-stakeholder group setting.

a) What are the key perceived economic as well as non-economic/ non-insurable impacts of climate change on herders and mining operations* in Mongolia?

Socio-economic impacts	Non-economic impacts
- Water shortage	- Desertification
- Pasture degradation	- Dryness
- Dzud and drought disasters	- Warming
- Livelihood losses	- Increase of natural disasters
- Social stress	- Fluctuations of precipitation
- Migration to urban centres	- Wild life extinction
- Unplanned expenditure	- Vegetation change
- Government expenditure will increase	- Depletion of water sources
- Increase of inflammatory disease	
- Food security and shortage	
- Expensive policy implementation	

*Key climate change impacts on Mongolia's mining sector were identified in the areas of water (mostly, shortage), increase in dust, and risks from flash flooding.

b) What are some of the factors to which these impacts are attributed?

- Disaster planning has not been implemented adequately.
- There is lack of collaborative activity with the mining sector.
- Mining uses large quantities of water, and competes with other water users.
- Overgrazing is caused by herders` behaviour, including herding patterns as well as commercial incentives.
- Pasture management has not been effective.
- Government budget is not well planned for reducing L+D.
- Government bodies lack sufficient equipment and technology for disaster management.
- Mined land rehabilitation has not been conducted satisfactorily.
- Quantity of herd: goat-dominated herd composition causes pasture degradation
- Lifestyle of herders has changed, becoming less mobile.
- There is a lack of information about climate change in all sectors.
- Public unawareness is caused by ineffective science communication.
- There is a lack of on-line and off-line platforms where stakeholders can access information.
- Unsustainable water use is a very common practice across all water user groups.
- Budget constraints have been a significant barrier for policy implementation.
- Government coordination on multi-stakeholder dialogue and collaboration is weak.
- Disaster preparedness is weak.
- There is a lack of public trust towards mining companies.
- Lack of cooperation among herders is a barrier.

c) What good practices and cases can be identified where mining companies may have collaborated with other economic sectors in the past to increase resilience, manage climatic disasters and address L+D? What are the opportunities for collaboration and building synergies to address common concerns and manage Loss and Damage?

Challenges	Policy responses	Opportunities for collaboration
Water shortage	<ul style="list-style-type: none"> - Training and promotional activities to encourage sustainable water use - Water tolls need to be introduced - To support water recycling - To create rain water collecting facilities - To support monitoring and preparation of water professionals - To encourage water recycling technologies, incentive policies, and protection of headwaters 	<ul style="list-style-type: none"> - To provide funding for building deep water wells - To improve water use monitoring - To conduct well-water monitoring - To increase water points - To build water reserves and ponds - To transfer water recycling technology - To increase funding on local environmental monitoring and research, advanced monitoring of water
Desertification	<ul style="list-style-type: none"> - Government needs to develop programs that can be translated into action - Government should review the implementation of the desertification program and assess the outcomes - To transfer power to local governments 	<ul style="list-style-type: none"> - Research organizations need to provide findings on the past, current and future of climate change - To develop agreed understanding of desertification - To conduct better science communication
Pasture	<ul style="list-style-type: none"> - To improve herd composition 	<ul style="list-style-type: none"> - To develop policy to encourage

degradation	(fewer goat) <ul style="list-style-type: none"> - To promote sustainable uses of pasture - To develop incentives and reward policies to shift from quantity to quality of herd - To promote lifestyle or behavioral changes - To increase seasonal moves (summer) - To prepare more fodder for winter 	<ul style="list-style-type: none"> herders to have cattle and sheep by providing subsidies and to implement livestock taxation. - To support coordination among local administration and other local herder groups to organize otor or seasonal moves. - To require infrastructure development of mining to minimize environmental impacts - To learn and share traditional herding culture
Drought & dzud disasters	<ul style="list-style-type: none"> - To improve insurance policies - To include funding in the local government budget for setting up a fodder reserve - To develop disaster risk plan and secure required funding - To set budget allocation for natural disaster management 	<ul style="list-style-type: none"> - Disaster relief by mining - To promote good practice
Dust	<ul style="list-style-type: none"> - Water and infrastructure requirements 	<ul style="list-style-type: none"> - Government needs to improve dust measurement methodology, engage professional associations, government bodies and NGOs Off-set rehabilitation programs need to be implemented under multi-stakeholder monitoring
Pubic attitude	<ul style="list-style-type: none"> - Public unawareness caused by ineffective communication 	<ul style="list-style-type: none"> - To have a special TV channel - To encourage behavioral change To redeploy traditional knowledge - To promote accessible science communication
Funding	<ul style="list-style-type: none"> - Natural resource payments to be transferred to the soums 	<ul style="list-style-type: none"> - Multi-stakeholder committee - Private-sector funding

In summary, across all stakeholder groups and across the three workshops, the following key impacts of mining and climate change were identified (in order of importance):

- i. Pasture degradation
- ii. Desertification
- iii. Water shortage
- iv. Dust
- v. Loss of traditional livelihoods
- vi. Food security

Through much deliberation, workshop participants identified the following as primary opportunities for collaboration:

- i. Increase the number of green facilities
- ii. Protect ground water resources by creating water reserves and encouraging water recycling

- iii. Improve infrastructure for mine-related shipment to minimise impact on herder lifestyle and pasture quality
- iv. Monitor impacts using citizen participation
- v. Develop consensus on what is desertification
- vi. Encourage cooperation between herder/ citizen cooperatives during seasonal movements

However, there were a number of barriers to collaboration for the opportunities identified above. The most significant barriers acknowledged across all stakeholder groups included the following (listed in order of importance):

- i. Lack of trust across sectors
- ii. Absence of strong regulatory preconditions for mining-related infrastructure development
- iii. Lack of, or insufficient budget allocation to disaster management, including raising disaster awareness among citizens
- iv. Poor accountability (across all three key sectoral functions – mining, herding and government)
- v. Limited technological know-how, in particular about the workings of the mining industry (including, use of water, treatment of waste water and other chemical pollutants during and or after the mining process)
- vi. Loss of traditional herding knowledge (accentuated by greater, almost unregulated rural to urban migration)
 - Lack of information (lack of knowledge feeds into an absence of rightful seeking of information by ordinary citizens)

At the same time, workshop participants outlined several support mechanisms and tools that would be useful in addressing these barriers both over the short- and long-term.

- i. Incentives for herders and miners from the government to support change in attitudes towards green development
- ii. Greater decentralization – both administrative and fiscal
- iii. Partnerships & incentives to encourage herders to:
 - a. maintain balanced herd compositions
 - b. share traditional herding practices
 - c. focus on herd quality, not just numbers
- iv. Public forums to identify local priorities – at soum as well as aimag levels
- v. Improve knowledge about disasters and their management – public awareness campaigns that may be sponsored by a public private partnership model (involving local mining companies, aimag government, and herder representative groups)
- vi. Draw best practice cases from national and international research on genetic herd quality

Workshop findings (Ulaanbaatar)

One of the project's key outcomes was to recommend the setting up of a 'Knowledge Hub' as a **formal platform** to bring stakeholders together, and to **generate new knowledge** by sharing perspectives, that would allow a holistic understanding of Mongolia's development challenges

The concluding UB workshop addressed the need for a Knowledge Hub and the resulting discussion brought forth useful suggestions to strengthen the idea of the Hub.

Why is a Knowledge Hub required?

On the one hand, herding maintains a deep social and cultural significance for Mongolia. On the other hand, mining sector offers huge potential for Mongolia's socio-economic development.

IPCC considers Mongolia one of the world's most vulnerable regions worldwide to climatic change. So far, there are discrete projects examining impacts from mining, climate change, herding on Mongolia's long-term sustainability, independent of cross-linkages and influence of one sector on another. There is therefore, limited understanding of the complexity resulting from the nexus of mining and herding when experienced through a climate lens.

How will the Hub address the mining-herding-climate nexus in Mongolia?

By bringing stakeholders together, it will:

- Foster equal opportunities across all stakeholder groups to raise concerns and local priorities
- Value strengths of individual sectors
- Foster partnerships by identifying issues of common concern
- Allow dissemination of information and knowledge amongst the wider society via sectoral representatives
- Enhance trust across groups who may have been in conflict previously
- Provide aimags and soums with decision making responsibilities and thus instill greater accountability and ownership
- Provide a platform to build a repository of traditional knowledge that is gradually fading away
- Facilitate innovation in addressing climate-influenced loss and damage

What should the Hub activities entail?

The proposal is to create an independent network organization that will have both a physical and an online presence.

For a Physical network to take effect:

- A steering committee at the national level, with one representative from each aimag; and a chairperson, elected every two years

- Aimag level committee – will include participants from across all relevant stakeholders
Government (soum, aimag) departments
Herder groups
Civil society and media
Mining companies
Artisanal miners
International organisations such as the Red Cross
- An annual meeting at the national level to share results achieved and outline program of future work
- Use Citizen Hall as an important avenue to disseminate information and organize multi-stakeholder meetings.
- Collaboration with Local Citizens` Representative Khural members to improve public awareness of key development challenges at the aimag level.

Online activities to support the Physical Hub will entail:

- Closely working with the Climate Change Coordination Office and interlinking with their information database on climate change, and partnership-based disaster management.
- The Ministry of Environment has accumulated information on climate change that may be shared online with HUB members. Work with the Ministry to develop toolkits, handbooks and source books that focus on the mining-climate disaster-livelihoods nexus and provide a holistic response to dealing with multiple drivers of change.
- Fundraising and seeking funding opportunities, both nationally and internationally are important to establishing the physical network, mentioned above.

In summary, the Hub will allow a **decentralised process of knowledge generation**, whereby:

- Each aimag will brainstorm ideas and work across sectors to identify priorities, and
 - Seek funds in consultation with the steering committee to plan and address priority issues
 - Develop oral histories of traditional knowledge and socio-environmental change to be applied in addressing contemporary challenges
 - Exchange knowledge and ideas with other aimags
 - Present results (including, barriers to action, future opportunities) at the annual meeting.
 - Scientific information will be communicated to the wider public, making it accessible
 - Deliver accessible information to herders in remote areas

Conclusions

This was a first of its kind project to discuss the complex links between livelihoods, mining and climate change and natural disasters in Mongolia.

The following four key observations founded the project's premise:

1. Suitable natural environmental conditions are critical to Mongolia's economic vitality. More than 70% of total pastureland is currently subject to overgrazing and desertification. At the same time, climatic changes severely impact herder livelihoods in Mongolia – economically, socially, and psychologically. In the 2009-2010 dzud, more than 20% of Mongolia's total livestock – perished, affecting 30% of the country's population;
2. Mining industry continues to grow, contributing approximately 30% of GDP and over 85% of export value nationally. While a number of negative socio-ecological impacts from mining on the Mongolian landscape have been reported, the industry also provides an array of alternative livelihood opportunities for pastoralists impacted during climate-influenced extreme events. At the same time, there is limited recognition within Mongolia that the mining sector is also vulnerable to climatic changes; and finally
3. Both herding and mining sectors compete over access to natural resources primarily, land and water. This, in turn, creates a serious potential for conflict, based on lessons from other world regions.
4. Climatic changes are expected to impact water and land availability, and remain therefore a critical concern common for both industries. There are a number of potential opportunities to marry individual strengths from the two sectors to jointly tackle climate uncertainties. In particular, while the herding sector maintains strong roots in traditional knowledge of past climatic disasters and experiences in climate-resilient animal husbandry, the mining industry has access to modern technological and financial resources.

In light of these observations, the project had the following five objectives:

1. Identify impacts of climate change on key sectors, including mining, herding, and civil society activities;
2. Identify current capacity within each sector to deal with these impacts;
3. Identify priority impacts and outline specific activities that can be undertaken in a collaborative manner for each impact;
4. Identify main barriers to collaboration; and
5. Identify ways to overcome these barriers – how, what and by who can support be provided to overcome barriers.

Policy recommendations

The project undertook three capacity building workshops, one each in Bayankhongor and Umnugovi aimags and a final concluding workshop in Ulaanbaatar. The findings from these workshops described in the above section can be used to identify policy recommendations in four key areas:

1. Green development
 - Better knowledge of the significance of green development at the local levels (Why)
 - Incentives to change behaviour (What)
 - Guidance to inform the process of changing behaviour (How)
 - Stakeholder involvement in the development of Climate change policy framework at the local level (How)
2. Disaster management
 - Better knowledge on what forms a disaster, classification, management and prevention, both pre- and post- disasters
 - Guidance from best practice, from national and international examples
 - Role of different sectors in managing and addressing disasters
 - Improved funding allocation to address risks, and manage loss and damage
3. Change in current herding style
 - Refocus to move attention from herd quantity to quality
 - Funding to allow studies on genetic herd improvements
 - Balanced herd with focus on an equitable spread of animals
4. Greater recognition of traditional herding knowledge
 - Importance of herder movement, and its role in disaster management and maintaining pasture quality
 - Improved funding to undertake studies reaffirming how herder movement during dzud events may reduce livestock loss

Knowledge Hub

A key output of the project has been to brainstorm the idea of establishing a network hub of key actors, or Knowledge Hub representing mining companies, herder groups, soum, aimag and central government authorities, civil society and media to facilitate a robust dialogue on capacity building in relation to climate adaptation and managing climate change-related Loss and Damage. The hub is expected to:

- Foster partnerships by identifying issues of common concern
- Value strengths of individual sectors
- Facilitate innovative means of addressing climatic concerns and disaster management
- Provide aimags and soums with decision making responsibilities and thus instill greater accountability and ownership of resource use and local challenges.

Future Directions

Scaling up: the role of the private sector in a climate resilient future

Based on the project outcomes, Civic Solutions is developing a program to encourage and strategize business's role in building climate resilient communities and society in collaboration with the Presidential Office of Mongolia.

The project discussions highlighted that much scope currently exists to further advance workshop ideas in the following three key areas:

1. Stakeholder engagement

First step is to initiate discussion with government agencies, mining companies and civil society organizations to deliver the findings of the workshops through factsheets and policy briefs. This will also involve mapping available resources on climate change, adaptation and L+D that individual organizations created and hold to develop an easily accessible database for different purposes and ready sources for further public education programs.

Mining companies expressed their interest to collaborate on programs to improve community resilience. This means the capacity of individuals, communities and systems to not only survive, but also adapt and grow. Some companies have already initiated programs to invest in managing shared resources that are under stress such as water and soil. Resilient community serves the business case as well. Our engagement will focus on shared, voluntary action and responsibility at local and national levels, by the public and private sectors, local communities and non-governmental organisations.

2. Knowledge Hub

Next step is to create an online platform that will be managed by a local organization (possibly Civic Solutions NGO) based on stakeholder support and engagement. The focus of the platform is to deliver information and practice tools suited for lay people, the private sector and local governments. Moreover, it will be a platform where science and research on climate change, adaptation, L+D and public private partnership can be communicated in an understandable and interesting way.

We will engage with relevant government ministries and aimag-level departments to create the Hub as a public-private-civil society network. The national and aimag-level Disaster Management Multi-stakeholder Platform that is proposed in the draft Emergence Management Law will be an important institutional foundation for the hub. Local Citizens' Hall and Local Development Fund are also important institutions that can coordinate the hub at the local levels.

3. Funding

We expect that government agencies, international organizations and mining companies will support and provide co-funding for creating the hub.

References

- ADB. (2014). "Preserving Mongolia's Pastures to Counter Climate Change." Retrieved 1 June, 2015, from <http://www.adb.org/features/preserving-mongolia-s-pastures-counter-climate-change>.
- Austrade (2011). Mongolian mining projects. Canberra, Australian Trade Commission, Commonwealth of Australia.
- Bittner, P. and K. Niemeyer (2015). Strengthening the Resiliency of Herders Facing Climate Change: The Case for Drought-Resistant Fodder. The UB Post. Ulaanbaatar.
- Bulgan, T. 2015. Green development policy of Mongolia and its implementation. MEGDT National Seminar to Advance Green Development and Implementation of PAGE in Mongolia 16-18 June 2015 Ulaanbaatar
- Combellick-Bidney, S. (2012). Mongolia's mining controversies and the politics of place. Change in Democratic Mongolia: social relations, health, mobile pastoralism, and mining. J. Dierkes. Leiden, Brill: pp. 271-296.
- Dalaibuyan, B. (2013). Scoping the potential for enterprise facilitation in Mongolia. Brisbane, International Mining for Development Centre.
- Failor, T. 2010. Shaping Mongolia's Urban Future. Asia Foundation. <http://asiafoundation.org/in-asia/2010/12/08/shaping-mongolias-urban-future/>
- Fernandez-Gimenez, M.E., B. Batkhishig, B. Batbuyan and T. Ulambayar. 2014. Lessons from the dzud: Community-based rangeland management increases adaptive capacity of Mongolian herders to winter disasters. *World Development* 68:48-65. doi:10.1016/j.worlddev.2014.11.015.
- Fish, M.S. (2001). The Inner Asian anomaly: Mongolia's democratization in comparative perspective. *Communist and Post-Communist Studies*, 34, pp. 323-338.
- Fincenter. (November 2011). Brief information: current economic situation of Mongolia. Retrieved 20 October, 2013, from <http://www.slideshare.net/FinproRy/brief-information-about-mongolia>
- Franks, D.M., Boger, D., Cote, C., & Mulligan, D. (2011). Sustainable development principles for the disposal of mining and mineral processing wastes. *Resources Policy*, 36(2), pp. 114-122.
- Hart, B., Greenfield, P., & Pascoe, M. (2008). Report to Queensland Premier. Review of the Fitzroy River Water Quality Issues. Department of Environment and Resource Management, Queensland Government, Brisbane.
- Lawson, E.T., & Bentil, G. (2013). Shifting sands: changes in community perceptions of mining in Ghana. *Environment, Development and Sustainability*, In Press. doi: 10.1007/s10668-013-9472-y
- Lioubimtseva, E. and G. M. Henebry (2009). "Climate and environmental change in arid Central Asia: impacts, vulnerability, and adaptations." *Journal of Arid Environments* 73: pp. 963-977.
- Myagmar, D. and A. Chuluun (2013). Review of recent extreme weather and climate events in Mongolia. The First Session of East Asian winter Climate Outlook Forum.

- Ochirsukh, Y. (2011). "Mongolia 2010 population census: main findings." Retrieved 20 October, 2013, from <http://www.slideshare.net/Ochiro/mongolia-2010-population-census-main-findings>
- Reeves, J. (2011). "Mongolia's environmental security." *Asian Survey* 51(3): pp. 453-471.
- Sayed, A. (2010). "Dzud: a slow natural disaster kills livestock --and livelihoods-- in Mongolia." <http://blogs.worldbank.org/eastasiapacific/dzud-a-slow-natural-disaster-kills-livestock-and-livelihoods-in-mongolia> accessed 24 May 2015.
- Sayed, A. (2010). "Ulaanbaatar's air pollution crisis: Summertime complacency won't solve the wintertime problem." 24 May 2015, from <http://blogs.worldbank.org/eastasiapacific/ulaanbaatar-s-air-pollution-crisis-summertime-complacency-won-t-solve-the-wintertime-problem>.
- Sharma, V. and D. Franks (2013). "In situ adaptation to climatic change: mineral industry responses to extreme flooding events in Queensland, Australia." *Society and Natural Resources* 26(11): 1252-1267.
- Sternberg, T. (2008). Environmental challenges in Mongolia's dryland pastoral landscape. *Journal of Arid Environments*, 72, pp. 1294-1304.
- Sternberg, T. (2012). The twilight of pastoralism? Livelihood, mobility, differentiation, and environmental engagement on the inner Asian Steppe. In J. Dierkes (Ed.), *Change in Democratic Mongolia: social relations, health, mobile pastoralism, and mining* (pp. pp. 195-220). Leiden: Brill.
- Tachiiri, K., M. Shinoda, B. Klinkenberg and Y. Morinaga (2008). "Assessing Mongolian snow disaster risk using livestock and satellite data." *Journal of Arid Environments* 72: pp. 2251-2263.
- Taylor, M. (2014). *The Political Ecology of Climate Change Adaptation: Livelihoods, Agrarian Change and the Conflicts of Development*. London, Routledge.
- Tiwary, R.K. (2001). Environmental impact of coal mining on water regime and its management. *Water, Air, and Soil Pollution*, 132(1-2), pp. 185-199.
- Togtokh, C. (2011). "Mongolian Gobi." Retrieved 2 June, 2015, from <https://http://www.youtube.com/watch?v=bU8Q8Vz3LNk&feature=share>.
- UN Stats. (2013). "2013 World Statistics Pocketbook Country Profile: Mongolia ", from <http://unstats.un.org/unsd/pocketbook/PDF/2013/Mongolia.pdf>.
- UNOCHA. (2010). "Mongolia Dzud Appeal 2010." Retrieved 30 May, 2015, from <http://www.unocha.org/cap/appeals/mongolia-dzud-appeal-2010>.
- Upton, C. (2009). "Custom" and contestation: land reform in post-socialist Mongolia. *World Development*, 37(8), pp. 1400-1410.
- Upton, C. (2012). Mining, resistance and pastoral livelihoods in contemporary Mongolia. *Change in Democratic Mongolia: social relations, health, mobile pastoralism, and mining*. J. Dierkes. Leiden, Brill: pp. 223-248.

Wagner, M. and F.-W. Wellmer (2009). A hierarchy of natural resources with respect to sustainable development - a basis for a natural resources efficiency indicator Mining, society and a sustainable world. J. P. Richards. London, Springer: 91-121.

Wang, J., D. G. Brown and A. Agrawal (2013). "Climate adaptation, local institutions, and rural livelihoods: a comparative study of herder communities in Mongolia and Inner Mongolia, China." *Global Environmental Change*, 23(6), 1673-1683.

Appendix 1: Glossary of Terms

CCA – Climate Change Adaptation

CCCO – Climate Change Coordination Office

DDR – Disaster Risk Reduction

DPL – Development Planning Law

EIA – environmental Impact Assessment

IPCC – Intergovernmental Panel on Climate Change

L+D – Loss and Damage

LDF – Local development Fund

MEGDT – Ministry of Environment, Green Development and Tourism

NEMA – National Emergency Management Agency

R&D – Research and Development

SAM – Sustainable Artisanal Mining

SEAT – Socio-Economic Assessment Toolbox

UNFCC - United Nations Framework Convention on Climate Change

**Can traditional livelihoods and mining co-exist in a changing climate:
Strengthening public-private partnerships in Mongolia to reduce risk and
address Loss and Damage**

Workshop
September 18, 2014
Dalanzadgad, Mongolia

Organizers

Dr Vigya Sharma (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

Dr Byambajav Dalaibuyan (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

Ms. Saruulzaya Adiya (PhD Candidate (Hokkaido University), Institute of Geography, Mongolian Academy of Sciences)

Dr Myagmartsooj Natsag (Mongolian State University of Education)

B.Tegshjargal (Department of Environment, Umnugovi Aimag)

Funding organization

Asia Pacific Network for Global Change Research (APN), Kobe, Japan

Partner organizations

Ministry of Environment and Green Development

Ministry of Mining

Disaster Protection and Research Centre

Governor`s Office of Bayankhongor Aimag

Governor`s Office of Umnugovi Aimag

Oyu Tolgoi LLC

Sustainable Artisanal Mining, SDC Mongolia

Project information

The project entails three capacity-building workshops in Mongolia that will facilitate public-private-civil society partnerships to address and better manage future climate risks. The workshops will focus on understanding how climatic changes impact both herding and mining – although in varied forms – and how each economic sector can leverage their resources to devise actions, strategies and tools that may help build their capacities and boost resilience to tackle changing climatic conditions.

In particular, the project has the following two objectives:

- a. While mining industry has access to modern technologies, latest climate data and financial resources, the herders have generations of traditional knowledge and experience living through a number of natural disasters. The workshops will focus on building resilience for both sectors by encouraging marriage of the traditional with the modern to create pathways for improved climate adaptation and sustainable livelihoods.
- b. The resources sector maintains a deep reliance on the natural environment for its operations. It relies extensively on a suitable climate for the sector's long-term viability. There is however, little information publically available that highlights how the mining industry is also vulnerable to climatic changes, including water stress, high temperature and extreme cold. The workshops will bring cases from other parts of the world where extreme weather-influenced natural disasters have significantly impacted mining operations. To that extent, the workshop aims to better develop our understanding of both direct and indirect repercussions of a changing climate on the mining industry.

Participants

- Government organizations
- Research institutes & centres
- Local governments
- Mining companies
- NGOs
- Herders
- Small scale miners
- Development & aid agencies
- Media

Agenda

08:30	Registration and morning tea	
09:00	Welcome and introduction to the symposium (introduce team, and project briefly)	Dr Myagmartsooj Natsag (Civic Solutions NGO)
09:10	Opening remarks	D.Natsagdorj Deputy Governor of Umnugovi Aimag
09:15	Opening remarks	Ms Sanaa Enkhtaivan (Climate Change Coordination Office)
9:20	Introduction to the project, workshop design and expected outcomes	Dr Vigya Sharma (CSRM, University of Queensland)
09:35	Climate change: discussion and fact	A.Saruulzaya (Institute of Geography, MAS)
10:00	Mining and climate change: observations from Australia and Mongolia	Dr Vigya Sharma
10:20	Q & A and discussion	Dr Byambajav Dalaibuyan (CSRM, UQ)
10:30	Morning tea	
10:45	Session One: Impacts and capacity needs assessment	
	Group activity	Dr Vigya Sharma
	Presentation & discussion	A. Saruulzaya
12:15	Lunch	
13:15	Information session	Aimag Emergency Department
13:15	Public-private partnerships and collaboration - International best practice cases from mining regions	Dr Byambajav Dalaibuyan
13:30	Session Two: Barriers to and benefits of collaboration	
	Group activity	Dr Byambajav Dalaibuyan
	Presentation & discussion	Dr Myagmartsooj Natsag
15:00	Afternoon tea	
15:15	Session Three: Identifying tools, strategies, measures to address barriers	
	Group activity	Dr Myagmartsooj Natsag
	Presentation & discussion	A.Saruulzaya
16:30	Concluding remarks & next steps	Dr Vigya Sharma
16:45	Concluding remarks	Dr Byambajav Dalaibuyan

**Can traditional livelihoods and mining co-exist in a changing climate:
Strengthening public-private partnerships in Mongolia to reduce risk and address
Loss and Damage**

Symposium

September 24, 2014

Bayankhongor, Mongolia

Organizers

Dr Vigya Sharma (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

Dr Byambajav Dalaibuyan (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

D.Batbold (Khongor Nutgiin Duudlaga NGO)

Ms. Saruulzaya Adiya (PhD Candidate (Hokkaido University), Institute of Geography, Mongolian Academy of Sciences)

U.Purevsuren (Civic Solutions NGO)

Funding organization

Asia Pacific Network for Global Change Research (APN), Kobe, Japan

Partner organizations

Ministry of Environment and Green Development

Ministry of Mining

Disaster Protection and Research Centre

Governor`s Office of Bayankhongor Aimag

Oyu Tolgoi LLC

Sustainable Artisanal Mining, SDC Mongolia

Project information

The project entails three capacity-building workshops in Mongolia that will facilitate public-private-civil society partnerships to address and better manage future climate risks. The workshops will focus on understanding how climatic changes impact both herding and mining – although in varied forms – and how each economic sector can leverage their resources to devise actions, strategies and tools that may help build their capacities and boost resilience to tackle changing climatic conditions.

In particular, the project has the following two objectives:

- c. While mining industry has access to modern technologies, latest climate data and financial resources, the herders have generations of traditional knowledge and experience living through a number of natural disasters. The workshops will focus on building resilience for both sectors by encouraging marriage of the traditional with the modern to create pathways for improved climate adaptation and sustainable livelihoods.
- d. The resources sector maintains a deep reliance on the natural environment for its operations. It relies extensively on a suitable climate for the sector's long-term viability. There is however, little information publically available that highlights how the mining industry is also vulnerable to climatic changes, including water stress, high temperature and extreme cold. The workshops will bring cases from other parts of the world where extreme weather-influenced natural disasters have significantly impacted mining operations. To that extent, the workshop aims to better develop our understanding of both direct and indirect repercussions of a changing climate on the mining industry.

Participants

- Government organizations
- Research institutes & centres
- Local governments
- Mining companies
- NGOs
- Herders
- Small scale miners
- Development & aid agencies
- Media

Agenda

08:30	Registration and morning tea	
09:00	Welcome and introduction to the symposium (introduce team, and project briefly)	Dr Byambajav Dalaibuyan
09:10	Opening remarks	D.Jargalsaikhan Governor of Bayankhongor Aimag
09: 15	Opening remarks	D.Batbold Khongor Nutgiin Duudlaga NGO
9:20	Introduction to the project, workshop design and expected outcomes	Dr Vigya Sharma (CSRM, University of Queensland)
09:35	Climate change: discussion and fact	Mrs Saruulzaya (Institute of Geography, MAS)
10:00	Mining and climate change: observations from Australia and Mongolia	Dr Vigya Sharma
10:20	Q & A and discussion	Dr Byambajav Dalaibuyan (CSRM, UQ)
10:30	Morning tea	
10:45	Session One: Impacts and capacity needs assessment	
	Group activity	Dr Vigya Sharma
	Presentation & discussion	Mrs Saruulzaya
12:15	Lunch	
13:15	Information session	Aimag Emergency Department
13:25	Public-private partnerships and collaboration - International best practice cases from mining regions	Dr Byambajav Dalaibuyan
13:30	Session Two: Barriers to and benefits of collaboration	
	Group activity	Dr Byambajav Dalaibuyan
	Presentation & discussion	U.Purevsuren
15:00	Afternoon tea	
15:15	Session Three: Identifying tools, strategies, measures to address barriers	
	Group activity	U.Purevsuren
	Presentation & discussion	Dr Byambajav Dalaibuyan
16:30	Concluding remarks & next steps	Dr Vigya Sharma
16:45	Concluding remarks	

**Can traditional livelihoods and mining co-exist in a changing climate:
Strengthening public-private partnerships in Mongolia to reduce risk and address
Loss and Damage**

Symposium

September 29, 2014

Ulaanbaatar, Mongolia

Organizers

Dr Vigya Sharma (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

Dr Byambajav Dalaibuyan (Centre for Social Responsibility in Mining (CSR), the University of Queensland, Australia)

Dr Gerelt-Od Erdenebileg (Civic Solutions, NGO)

Ms. Saruulzaya Adiya (PhD Candidate (Hokkaido University), Institute of Geography, Mongolian Academy of Sciences)

Dr Myagmartsooj Natsag (Mongolian State University of Education)

Funding organization

Asia Pacific Network for Global Change Research (APN), Kobe, Japan

Partner organizations

Ministry of Environment and Green Development

Ministry of Mining

Climate Change Coordination Office

Institute of Disaster Research

Governor`s Office of Bayankhongor Aimag

Governor`s Office of Umnugovi Aimag

Sustainable Artisanal Mining project, SDC

Project information

The project entails three capacity-building workshops in Mongolia that will facilitate public-private-civil society partnerships to address and better manage future climate risks. The workshops will focus on understanding how climatic changes impact both herding and mining – although in varied forms – and how each economic sector can leverage their resources to devise actions, strategies and tools that may help build their capacities and boost resilience to tackle changing climatic conditions.

In particular, the project has the following two objectives:

- e. While mining industry has access to modern technologies, latest climate data and financial resources, the herders have generations of traditional knowledge and experience living through a number of natural disasters. The workshops will focus on building resilience for both sectors by encouraging marriage of the traditional with the modern to create pathways for improved climate adaptation and sustainable livelihoods.
- f. The resources sector maintains a deep reliance on the natural environment for its operations. It relies extensively on a suitable climate for the sector's long-term viability. There is however, little information publically available that highlights how the mining industry is also vulnerable to climatic changes, including water stress, high temperature and extreme cold. The workshops will bring cases from other parts of the world where extreme weather-influenced natural disasters have significantly impacted mining operations. To that extent, the workshop aims to better develop our understanding of both direct and indirect repercussions of a changing climate on the mining industry.

Symposium objectives

The symposium aims to bring together key stakeholders from policy and practice operating in Mongolia's minerals and environmental space. The symposium will present findings from two in-country workshops undertaken earlier in the month in Bayankhongor and Umnogovi. Final outcomes from the symposium will include a set of policy recommendations to enable cross-sectoral cooperation and partnerships to build capacity at all governance levels to address climatic risks and manage Loss and Damage resulting from climatic events. Moreover, the symposium will propose the establishment of a network hub of key actors from across Mongolia to continue a robust dialogue on mining, herding, climate change and capacity building that will involve representation from mining companies, herder groups, soum, aimag and central government authorities, civil society groups and the media.

Speakers, panellists, moderators

Minister Oyun Sanjaasuren (Minister of Environment and Green Environment)

Mr Ya.Badrakh (External Relations, Ministry of Mining)

Dr. Chuluun Togtohyn (Institute for Dryland Sustainability, National University of Mongolia)

Dr B.Batbuyan (Director of Social and Economic Section, Institute of Geography, MAS)

Dr N.Bandi (Director, Khustai National Park)

Dr Vigya Sharma (CSRM, University of Queensland)

Ms Baigalmaa Shurka (General Manager, RDSP, Oyu Tolgoi LLC) – tentative

Dr Henri Rueff (Researcher, Oxford University)

Dr V.Batsaikhan Vanchindorj (Head of Disaster Protection and Research Centre)

Mr Ts.Gerelt-Od Tsogtbaatar (Climate Change Coordination Office)

Dr Altanbagana Myagmarsuren (Institute of National Development)

Ms. Saruulzaya Adiya (PhD Candidate, Hokkaido University and a researcher at Institute of Geography, Mongolian Academy of Sciences)

Dr Gerelt-Od Erdenebileg (Director, Civic Solutions NGO)

Dr Byambajav Dalaibuyan (CSRM, University of Queensland)

Participants

- Government organizations
- Research institutes & centres
- Local governments
- Mining companies
- NGOs
- Herders
- Small scale miners
- Development & aid agencies
- Media

Agenda

Venue: The Fresh Water Resources and Nature Conversation Centre, Zaisan, Ulaanbaatar

8:30	Registration and morning tea	
9:00	Welcome and introduction to the symposium (introduce team, and project briefly)	Dr Gerelt-Od Erdenebileg (Civic Solutions NGO)
9:15	Opening remarks	Minister Oyun Sanjaasuren, Ministry of Environment and Green Environment
9:25	Opening presentation	Dr T.Chuluun, Advisor to the Minister of E&GD
9:30	Opening remarks	Mr Ya.Badrakh (Ministry of Mining)
9:45	Introduction to the project and reporting from the field workshops	Dr Vigya Sharma (CSRM, University of Queensland) and project team members
10:30	Morning tea	
10:45	Panel Discussion One: Climate change adaptation (CCA) and disaster risk reduction (DRR) in Mongolia – national and local developments	
5-7 min presentations & facilitated discussion	Moderator	Dr B.Batbuyan (Director of Social and Economic Section, Institute of Geography, MAS)
	Mongolia's Policy on Climate Change	Mr Ts.Gerelt-Od Climate Change Coordination Office
	<i>Vulnerability</i> and Adaptation Policy Options of Social-Ecological Systems to Climate Change	Dr Altanbagana Myagmarsuren (Mongolian Development Institute)
	Climate induced disaster management	Dr Batsaikhan Vanchindorj (Head of Disaster Protection and Research Centre)
	Climate perception and hazards in a pastoral context	Dr Henri Rueff (Researcher, Oxford University)
	Gender and Green Development	Ms. B.Onon (Gender Centre for Sustainable Development)
	Panel discussion and Q &A	Dr. Tsogtbaatar Jamsran Ms. Saruulzaya Adiya
12:30	Lunch	Modern Nomads
13:30	Panel Discussion Two: Mining and climate change nexus & public-private partnership	
	Moderator	Dr. T.Chuluun, Adviser to Minister S.Oyun
	Mining and climate change: observations from Australia and Mongolia	Dr Vigya Sharma

	Oyu Tolgoi – sustainability and participatory monitoring	Ms Sh.Baigalmaa, General Manager, RDSP, Oyu Tolgoi LLC
	Applying local best practices (Case of Khustai Park) in mining regions	Dr Bandi Namkhai (Director, Khustai National Park)
	Public-private partnerships and collaboration - International best practice cases from mining regions	Dr Byambajav Dalaibuyan
	Panel discussion and Q &A	Dr T.Chuluun Dr N.Myagmartsooj
15:00	Afternoon tea	
15:15	Knowledge Hub – proposal and developing further ideas	Facilitated discussion
16:00	Policy recommendations, comments and questions	Dr D.Byambajav Dr Vigya Sharma
16:15	Next steps	Dr Vigya Sharma
16:25	Concluding remarks	Dr D.Byambajav

Appendix 3: List of workshop participants

Umnugovi Workshop

Umnugovi government representatives

D.Natsagdorj	Deputy Governor
T.Dulbayar	Head of Department of Development Planning
J.Sukh-Erdene	Department of Development Planning
E.Gankhuyag	Department of Development Planning
B.Purevtulga	Department of Development Planning
B.Tegshjargal	Head of Department of Environment
B.Munkhchuluun	Department of Industry and Agriculture

Herder representatives

N.Javkhlan	Gurvantes Soum
D.Nandintsetseg	Gurvantes Soum
L.Soyolbadrah	Tsogttsetsii Soum
B.Bayarmagnai	Tsogttsetsii
Ts.Enkhchimeg	Khanbogd Soum

Mining company representatives

G.Gantsetseg	Tavantolgoi LLC
G.Odontuya	Tavantolgoi LLC
D.Byambajav	Energy Resources LLC
M.Mungunkhonkh	Energy Resources LLC
O.Tserennadmid	Oyu Tolgoi LLC
B.Bayarbaatar	Oyu Tolgoi LLC
S.Erdenebat	Oyu Tolgoi LLC
D.Erdenetogtokh	Oyu Tolgoi LLC
D.Oljmedekh	Oyu Tolgoi LLC
A.Irlan	Hunnu Coal LLC

D.Ulziibayar Terra Energy LLC

M.Bumantuya MAK LLC

NGO representatives

I.Oyun Dalanzadgad Soum

D.Davaanyam Dalanzadgad Soum

S.Maamankhuu Dalanzadgad Soum

B.Zandraa Dalanzadgad Soum

S.Enebish Dalanzadgad Soum

L.Baatarkhuu Tsogttsetsii Soum

D.Bat-Ochir Gurvantes Soum

D.Khurelbaatar Khanbogd Soum

Local environmental officers

Ch.Enkhzaya Gurvantes Soum

Sh.Otgonbayar Tsogttsetsii Soum

N.Unenbat Khanbogd Soum

L.Enkhsaran Bayan-Ovoo Soum

Media representatives

Ch.Enkhtsetseg Altangobi TV

Bayankhongor Workshop

Aimag government representatives

D.Jargalsaikhan	Governor
G.Javkhlan	Head of Water Basin Authority of Buun Tsagaan Lake and Baidrag River
G.Nansalma	Head of Water Basin Authority of Orog Lake and Tuin River
E.Unurzaya	Department of Environment
T.Ganbold	Ikh Bogd National Park Administration
Sh.Bat-Ochir	Underground Water Officer, Bayankhongor
B.Munkhtohtokh	Ground Water officer, Bayankhongor
B.Nyam-Ochir	Water Basin Authority of Orog Lake and Tuin River

Soum government representatives

L.Batsaikhan	Chairman of CRK of Galuut Soum
A.Tumennast	Cadastre officer, Galuut Soum
Kh.Munkh-Erdene	Sustainable Artisanal Mining project, Bayankhongor
S.Baatar	Governor of Bumbergour Soum
D.Sainbileg	Governor of Jargalant Soum

Herders` representatives

B.Naranbaatar	Bayan-Ovoo Soum
G.Magvanjav	Galuut Soum
B.Mendbat	Bumbergour Soum
L.Erdenechimeg	Bumbergour Soum
D.Batbileg	Jargalant Soum
L.Purevdorj	Jargalant Soum
D.Ochgerel	Galuut Soum
Kh.Sharavnyambu	Galuut

Mining company representatives

G.Erdenebat	Andiin Temuulel LLC
G.Luvsandorj	Gobi Coal LLC

ASM representatives

J.Saruul	Bumbugur Soum
M.Tsolmon	Galuut Soum
G.Otgonbayar	Galuut Soum
N.Batsukh	Bayan-Ovoo Soum

NGO representatives

T.Khurelsukh	Bayan-Ovoo
D.Batbold	Bayankhongor
D.Batchuluun	Bayankhongor
G.Batsaikhan	Bayankhongor
J.Sainbileg	Jargalant Soum
D.Batdamba	Bayankhongor Red Cross

Local environmental officers

D.Dankhaa	Jargalant Soum
D.Gandorj	Galuut Soum

Ulaanbaatar, concluding workshop

Government agencies

Dr S.Oyun	Minister of Environment
Dr T.Chuluun	Ministry of Environment
Ya.Badrakh	Ministry of Mining
Dr B.Batsaikhan	Disaster Research Institute
Ts.Gerelt-Od	Climate Change Coordination Office
Ch.Altangerel	National Human Rights Commission
M.Davaadorj	Ministry of Mining

Local government

L.Batsaikhan	Galuut Soum
G.Javkhlan	Water Basin Authority, Bayankhongor

Research organizations

Dr Vigya Sharma	University of Queensland
Dr Byambajav Dalaibuyan	University of Queensland
A.Saruulzaya	Mongolian Academy of Science
Dr N.Myagmartsooj	Mongolian National University of Education
Dr D.Batbuyan	Mongolian Academy of Science
Dr M.Altanbagana	National Development Institute
Dr B.Oyungerel	Mongolian Academy of Science

Mining companies

Sh.Baigalmaa	Oyu Tolgoi LLC
Dr O.Erdenetuya	Erdenet LLC
R. Brillie	Areva LLC
Ch.Och	Areva LLC
B.Anjlai	Areva LLC
L.Luvsandorj	Gobi Coal LLC

B.Bat-Erdene	Tsairt Minerals LLC
B.Erlan	Uvurkhangai Aimag

NGOs

Dr N.Bandi	Hustai National Park
D.Batdamba	Bayankhongor Red Cross
Ch.Tuya	Khan Khentii Khatan Tuul NGO
R.Tumendemberel	Umbrella NGO of ASMs
O.Tsetsegmaa	Umbrella NGO of ASMs
B.Narantsogt	Umbrella NGO of ASMs
D.Chagnaadorj	Umbrella NGO of ASMs
O.Oyuntsetseg	Gender Centre for Sustainable Development
B.Onon	Gender Centre for Sustainable Development
Ts.Dorjsuren	Aaviin Bayan Khangai NGO
B.Batkhisig	Mining for Development NGO

Herders

S.Soyolbadrakh	Tsogttsetsii Soum
I.Oyun	Khankhongor Soum

International organizations

D.Khishgee	Sustainable Artisanal Mining Project
P.Bolormaa	Asia Foundation
N.Quigley	Australian AVID Volunteer
J.Lander	Warwick University researcher
G.Austin	University of Q

Appendix 4: Funding sources outside the APN

Ministry of Green development, Environment and Tourism

Climate Change Coordination Office

In-kind support for handouts, booklets and other printed materials for the workshops

Oyu Tolgoi LLC

In-kind funding of bringing the participants from Umnugovi to Ulaanbaatar workshop

Sustainable Artisanal Mining (SAM), Swiss development Cooperation

In-kind co-funding of some participants in Bayankhongor workshop

In-kind support for communicating with the workshop participants and workshop organization

Ministry of Mining

Department of Development Planning, Umnugovi Aimag

Department of Environment, Umnugovi Aimag

National Emergence Management Agency

Department of Environment, Bayankhongor Aimag

Red Cross Mongolia, Bayankhongor Aimag

National Development Institute of Mongolia

Gender Centre for Social Development NGO

Hustai National Park

Appendix 5: List of Young Scientists

Two young scientists were involved in this project:

Ms. Saruulzaya Adiya, Team member, PhD Candidate (Hokkaido University), Mongolian Academy of Sciences, Mongolia, saruulzaya@gmail.com

Ms. U.Purevsuren. Team Member. PhD student (Mongolian National University of Education) puuj_u@yahoo.com