

Disaster Risk Reduction in Mongolia

Status Report 2019



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UNDRR

UN Office for Disaster Risk Reduction

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About this report

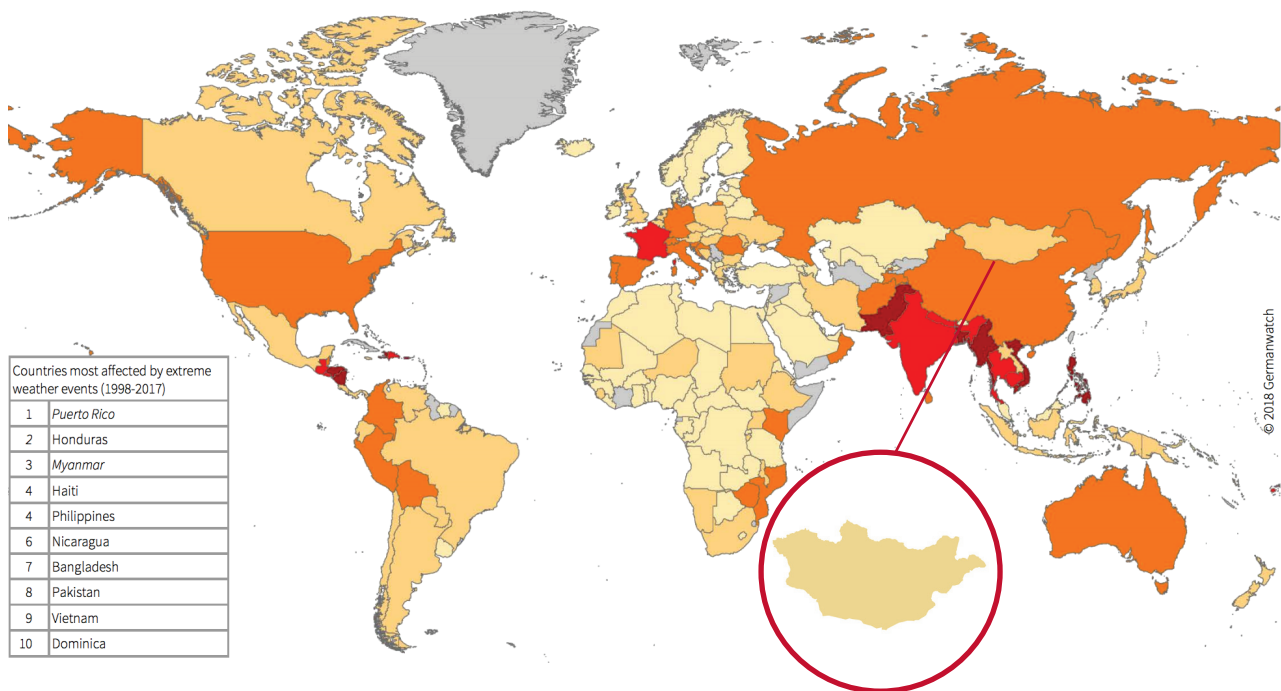
The Disaster Risk Reduction (DRR) report provides a snapshot of the latest DRR progress Mongolia has achieved under the four priorities of the Sendai Framework. It also highlights some of the key challenges surrounding the issue of creating coherence among the key global frameworks at the country level; and makes recommendations for strengthening the overall Disaster Risk Management (DRM) governance by government institutions and other stakeholders at national, sub-national, and local levels.

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The findings, interpretations, and conclusions expressed in this document do not necessarily reflect the views of UNDRR or of the United Nations Secretariat, partners, and governments, and are based on the inputs received during consultative meetings, individual interviews, and the literature reviews conducted by the research team. While every effort has been made to ensure the accuracy of the information, the document remains open for any corrections in facts, figures and visuals.

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UNDRR (2019). Disaster Risk Reduction in Mongolia: Status Report 2019. Bangkok, Thailand, United Nations Office for Disaster Risk Reduction (UNDRR), Regional Office for Asia and the Pacific



Climate Risk Index: Ranking 1998 - 2017

1-10

11-20

21-50

51-100

>100

No data

(GermanWatch,2019)

POPULATION 2018

Total Population	3,177,899
Urban Population	2,146,716 (67.5%)
Population Density Per Km ²	2

ECONOMIC INDICATORS

Gross Domestic Product in Current \$US	11.49 billion
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GDP Per Capita (\$US)	3,735.16
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GDP Growth (Annual %)	5.4
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HUMAN DEVELOPMENT

Human Development Index	0.741
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HDI Rank	92
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Income Level Category	Lower-Middle income
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Climate Risk Index

Rank 62 / Low Risk*

INFORM Risk Index

Rank 103 / Low Risk**

* Climate Risk Index of 2019 analyses the extent to which countries have been affected by weather-related losses between 1998-2017 (GermanWatch, 2019). However, it should be noted that the CRI may not provide an accurate presentation of the future risk due to the fact that it measures data of past events (which may not always be available depending on the country). Thus, for example in the case of Mongolia, low CRI score does not accurately indicate low climate risk in the future.

** INFORM risk index is a global tool which measures the risk of humanitarian crises and disasters based on 50 indicators assessing hazards, vulnerability and capacity (resources available to mitigate the impact) (INFORM, 2019)

1. Introduction

Mongolia is a landlocked country between Russia and China, located in Eastern Asia. In terms of administration, it is divided into 21 provinces (Aimags), which are further divided into 329 rural districts (Soums), and 1,568 sub-districts (Baghs). However, of the 1,564,116 km² of land that the provinces cover, very little is arable; 75% of it is dominated by semi-arid grass steppes (similar to prairies) (Fernandez-Gimenez, et al., 2015). Mongolia is also regularly affected by climatic extremes and severe weather. The temperatures may reach -50°C degrees during winters, hence granting the capital Ulaanbaatar, with the reputation as the world's coldest capital city.

Mongolia is also one of the most disaster-prone countries in the world, susceptible to dzuds, dust storms, droughts, floods, wildfires and earthquakes (CFE-DM, 2018). Of these, dzuds (severe winter colds and/or heavy snow associated with large-scale livestock losses), droughts and fires have caused catastrophic damages due to their complex interaction with the steppe ecosystems and livelihoods. In 2010, the country was hit by a dzud which dropped the temperatures rapidly below -30°C and blanketed 90% of the country in heavy snow (Save the Children, 2010). This caused the loss of approximately 8.8 million animals as they froze to death or could not graze (see figure 2). In 2018, another severe dzud killed 700,000 heads of livestock (Davaasharav, 2018).

Due to the harsh environment and the present natural ecologies hindering traditional agriculture, Mongolians have historically opted for nomadic pastoralism, as herds are mobile and more resistant to weather. Animal husbandry has always had a large impact on economy, employment and export income (figure 3), and the sector still employs 29% of all working age populations (National Statistics Office of Mongolia, 2019). However, hazards such as the dzuds, droughts and fires have been shown to increase in intensity, thus compromising the traditional lifestyles of the people. As a result, many are turning towards other sources of income such as mining and manufacturing (figure 4). The government's official development strategy for the future largely relies on utilizing the country's mineral riches.

1.1 Demographic Characteristics

The population of 3,177,899 people is scattered across the country, making Mongolia as one of the least densely populated regions in the world, with average density of 2 people per square kilometer. However, the urban population is rapidly growing due to domestic migration, and Ulaanbaatar was housing almost half of the total population in 2017 (National Statistics Office of Mongolia, 2019). The people inhabiting the country are ethnologically homogenous, with Mongols representing 94% of the population (UNDP, 2011). Yet, a number of ethnic subgroups exists, each having their own distinct customs and dialects.

When it comes to human development, progress has been made over the last 25 years in terms of the socio-economic status of citizens. Poverty has declined since 1995, but in 2016, 29.6% of the population still lived below the poverty line (NSO, 2017).

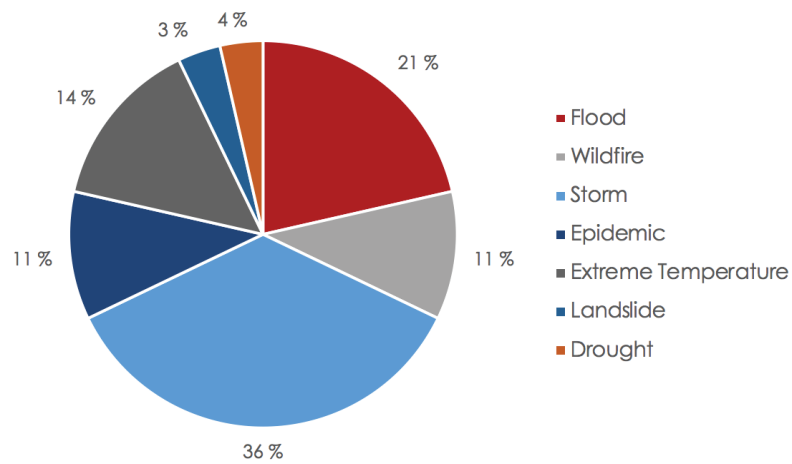


Figure 1. Events classified as disasters in Mongolia by occurrence, 1990-2018 (EmDat).

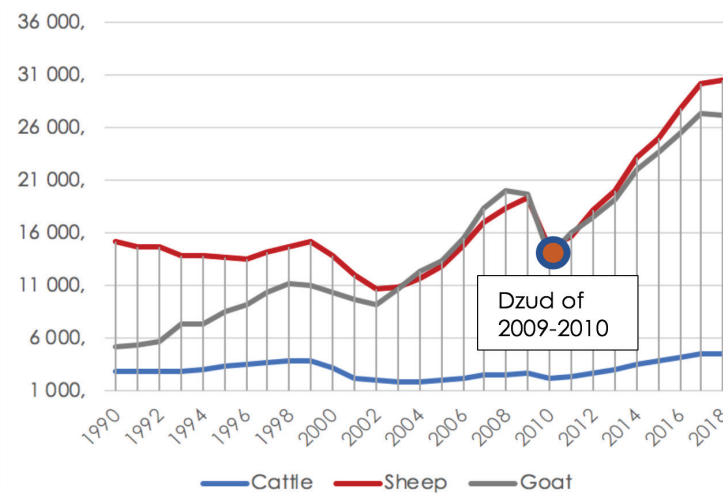


Figure 2. Numbers of cattle, sheep and goats ('000) 1980-2018 (National Statistics Office of Mongolia, 2019).

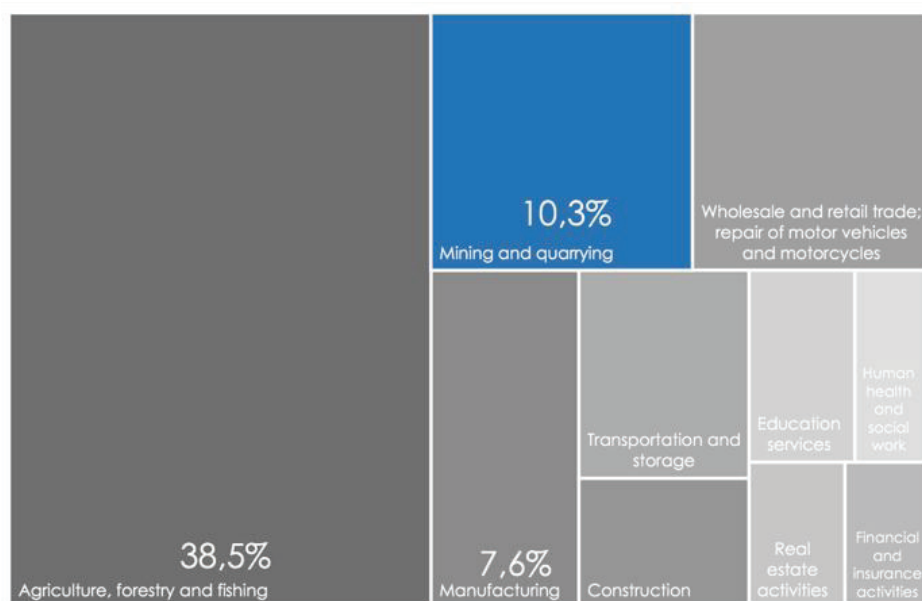


Figure 3. Largest industries contributing to, and their portion of the GDP in % in 1996.
Data sourced from National Statistics Office of Mongolia (2019).

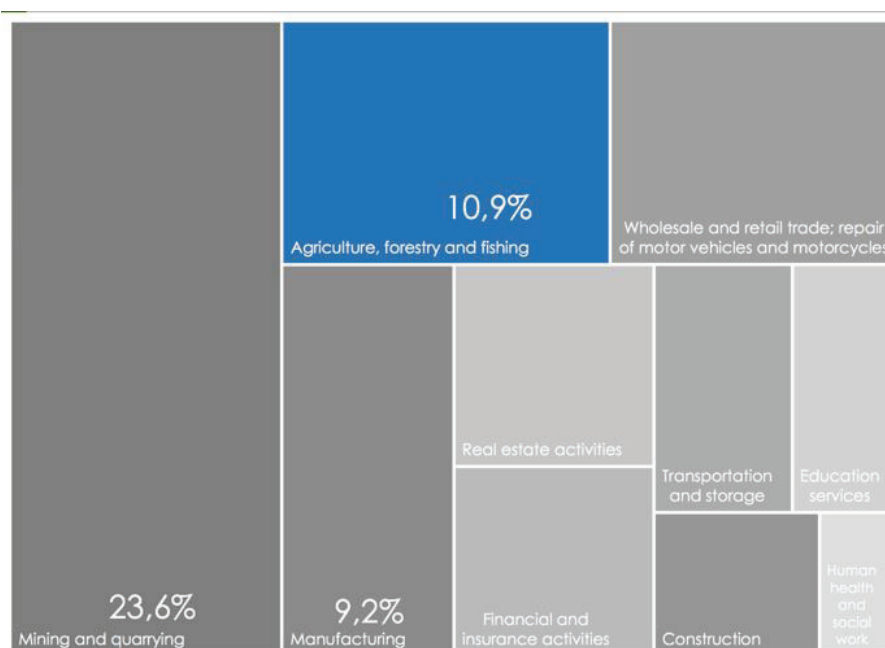


Figure 4. Largest industries contributing to, and their portion of the GDP in % in 2018.
Data sourced from National Statistics Office of Mongolia (2019).

1.2 Economic Impact of Disasters

Disasters in the last 10 years have caused a total economic loss of approximately \$US 321.3 million (845.2 billion tugriks) (NEMA; JICA, 2018). However, economic losses from the dzud of 2009-2010 alone reached 4% of the yearly GDP, and from the total losses that occurred between 1996-2013, almost 40% was caused by said event (figure 6). The dzud also affected 220,000 households in fifteen provinces, and resulted in a monetary loss of US\$ 192 million, (Benson, 2011). As a large portion of the country's income has been sourced from animal products, including internationally renowned cashmere and wool, loss of livestock has severe long-term impacts on the economy. The effects of the dzud were heightened by the global economic crisis which began in mid-2008, as the foreign trade of Mongolia is also heavily dependent on gold, copper and coal exports (Benson, 2011) which are also vulnerable to fluctuations of the global markets.

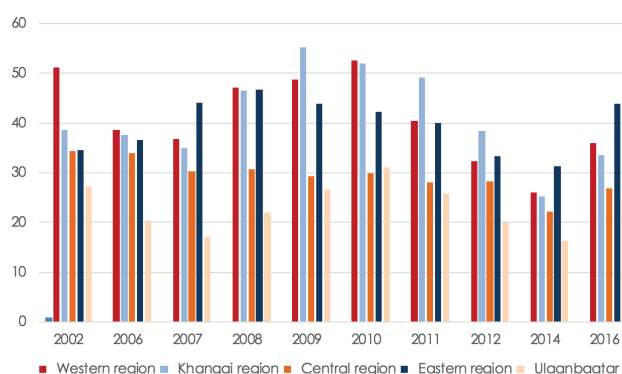


Figure 5. Poverty rate by province, 2002-2016 (National Statistics Office of Mongolia, 2019).

Since 1992, the GDP experienced steady growth despite the domestic challenges related to trade-dependence. To further diversify production and to effectively utilize available resources, the economy was increasingly tied to the mining industry and agriculture – up until the dzud of 2009-2010. As a combined result of the disaster and global recession, government's budget was stretched to the limits. The effects had direct negative consequences; for example, the government faced the inability to provide child welfare payments to the herder households, poorer of which depended on the government's transfers (Benson, 2011). The inflows of Foreign Direct Investments (FDI) were then welcomed to boost the economy (Stewart, 2014), and to reduce the reliance on pastoralism to safeguard the future development from disaster harm. Indeed in 2011, the year following the dzud disaster, share of FDI in GDP reached 43.9% (The World Bank, 2019). This was the suspected result of increased investors' confidence in Mongolia which followed the agreement to develop the Oyu Tolgoi copper-gold mine, largest of its kind in the history of the country (Enkhbayar, et al., 2010).

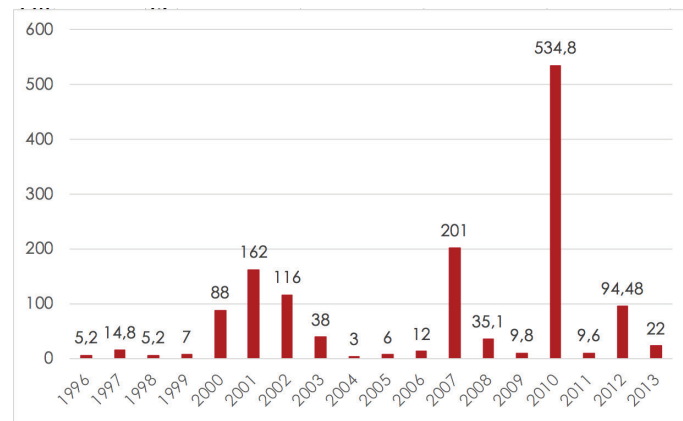


Figure 6. Economic damage caused by disasters 1996-2013 (billion tugriks) (National Statistics Office of Mongolia, 2019).

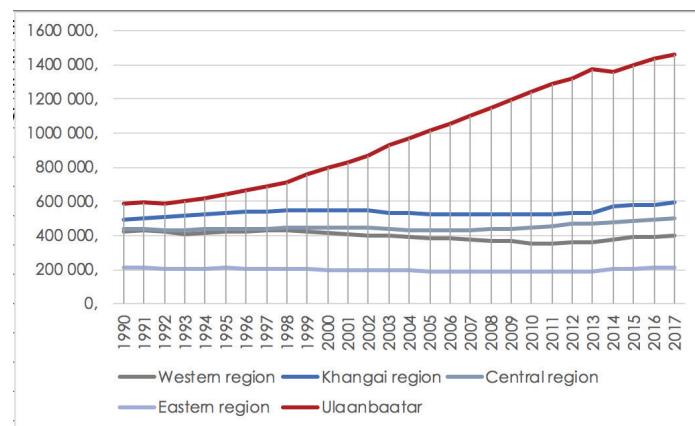


Figure 7. Population growth in Ulaanbaatar versus in other most populous regions in 1990-2017 (National Statistics Office of Mongolia, 2019).

1.3 Social Impact of Disasters

Because of the disaster losses experienced by the population, and when a significant number of households have lost their livelihoods to dzuds, people are moving towards urban centers to look for other employment opportunities (figure 7). Also, as a response to alleviate poverty, unemployment, disaster risks, and to reduce the country's reliance on agriculture, Mongolia is rapidly transitioning from pastoralism towards industry (Hessl, et al., 2015). As can be seen from figure 4, mining is increasing its portion of the GDP, and attracts ex- farmers from rural areas to mine sites, as well as towards Ulaanbaatar to find new employment opportunities.

While the risks of droughts, dzuds and urbanization processes have been frequently addressed in research, a new, emerging phenomenon has been gaining momentum. Parts of the poverty-driven population, instead of turning to urban regions for employment opportunities, turn to artisanal mining at various sites left behind by mining companies. Informal mining has been stated to form the very foundation of Mongolia's informal economy, employing tens of thousands of people (Munkherdene & Sneath, 2018). Utilization of the staggering amounts of natural mineral deposits has become the official poverty reduction narrative of the country (Hatcher, 2016) (Lahiri-Dutt & Dondov, 2017), thus also attracting the attention of the general population.

2. Disaster Risk Profile

The number, occurrence, severity, and impact of natural, technological or anthropogenic hazards have been increasing during the period between 2000 and 2016 (UNECE, 2018). The reasons behind the increase in plethora of risks, exposure and vulnerabilities are manifold – still, this chapter attempts to condense the main drivers contributing to the ever-increasing disaster and climate risks in Mongolia.

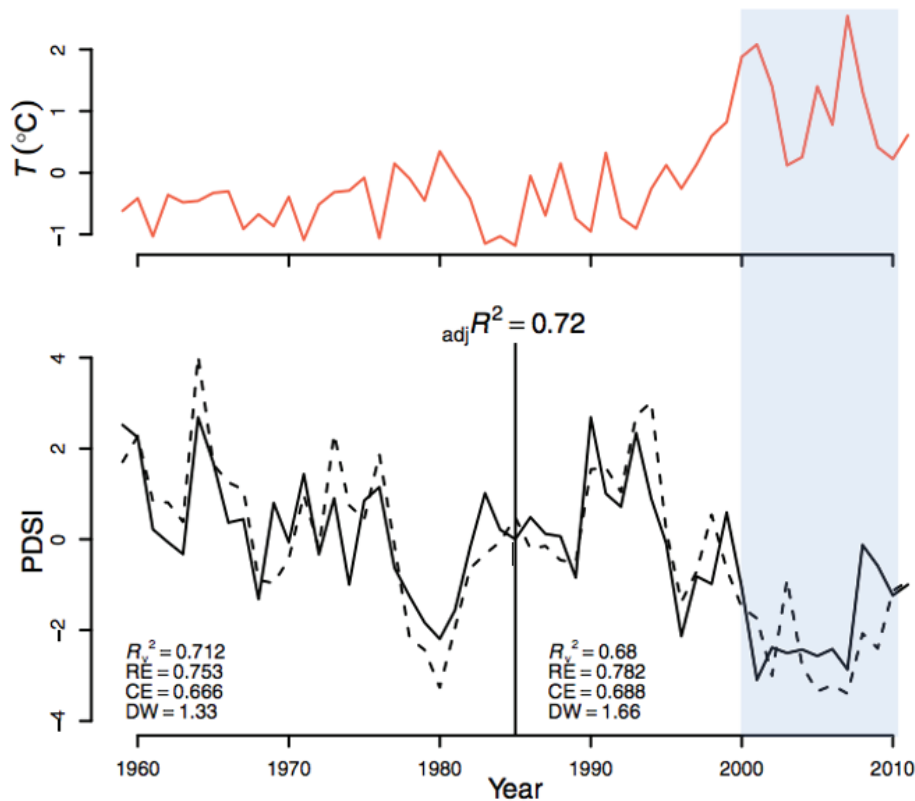


Figure 8. Surface temperature anomalies in Mongolia and the Palmer Drought Severity Index (PDSI) in 1960-2010 (Hessl, et al., 2018).

2.1 Hazards and Climate Change

Dzuds are often characterized by preceding summer droughts, followed by cold and deep snow during winters which results in massive livestock deaths. The winter storms have been found to be correlate with periods of drought which affect the strength of animals to withstand severe weather; malnutrition can detrimentally weaken the herds and thus increase losses and lessen future productivity (CFE-DM, 2018) (Kang, et al., 2015). Livestock losses can further be affected by epidemics such as foot-and-mouth disease (FDM) which may have catastrophic consequences to individual families in affected regions. Despite the government providing free vaccinations for anthrax and septicemia, livestock diseases still remain to be a chronic issue for the herders (People in Need, 2018).

Another common hazard in Mongolia are steppe fires, which occur frequently during the dry seasons, usually as a result of human actions (Nasanbat, et al., 2018). While the ecoregions containing forests are prone to fires in varying frequency and severity,

most vulnerable areas are the steppe and grassland ecosystems across the country (GFI, 2009). Paradoxically, the grasslands require seasonal fires to boost their fertility and regrowth, thus making steppe grasslands also fire-dependent (GFI, 2009). The approaches to fire-fighting have been largely preventative, especially in remote regions where communities aim to suppress any sign of fires due their potential to threaten livelihoods (GFI, 2009). This poses a threat to the stability of natural ecosystems which require seasonal fires to flourish.

The ecological systems in Mongolia are fragile; the topsoil has an average depth of 20 cm, making it vulnerable to wind and water erosion processes (UNDP, 2011). The conditions also cause rapid evaporation of water; thus, floods have been largely considered to be an irrelevant factor in terms of possible disaster threats. However, higher than normal precipitation causing runoffs has a potential to create flash flooding in areas where the absorptive capacity of the soil is low (Tsutsumida, et al., 2015).

Potential hazards are often worsened by climate change; Mongolia has been found to have globally strongest trends in increased seasonal heat and cold extremes which has started to hinder output of pastoral industry (Fernandez-Gimenez, et al., 2015). The mean surface air temperature in Mongolia has increased by 2.07°C between 1940 and 2013 (figure 9) (Ministry of Environment and Green Development, 2014), which is almost 2,5 times has higher than the world average of 0,85°. According to studies modelling climate from annual growth of tree rings, the observed climate change during the last 40 years surpassed every change that has happened in the last few thousand years (Ministry of Environment and Green Development, 2014). The effects can be seen already; pasture production has decreased 20-30% during the past 40 years, forest areas have decreased, lake areas and volume of fresh water springs are decreasing, including the ground water table (The Government of Mongolia , 2015). Hessel, et al. (2015) established that the early 2000's drought was highly unorthodox when compared to any other similar event during the last 1100 years (figure 8, 2000-2010 drought highlighted). While future trajectory of drought risk is difficult to predict as it is dependent on factors such as climatic variations, increased CO₂ and temperature projections (Hessel, et al., 2018), it is safe to assume that any further deterioration to the current conditions could be perilous to peoples' livelihoods and the economy. Droughts have also been found to appear in synchronization with seasonal fires (Hessel, et al., 2016), which means that increased frequency and severity of droughts may potentially increase the occurrence of fires.

Even though the steppe ecosystems are fire-dependent, impacts of fire are not altogether positive. Increased forest fires in areas with stable permafrost has negative effects to the availability of water; loss of permafrost due to increased fires eventually results in faster runoff of rainfall and lessens the soil's capacity to store water (Menzel, et al., 2016). This reduces water availability for forests and people in the Northwest of the country and indicates that the stability of the Mongolian ecological systems is dependent on multiple self-regulating processes which are inherently fragile to any environmental disruption. Flood risk is also likely to increase as a result of climate change, as seasonal precipitation is expected to increase (Jiang, et al., 2016). Recently in 2018, flash flooding in July caused by heavy rain affected nearly 3000 people resulting in the loss of lives and property (CFE-DM, 2018).

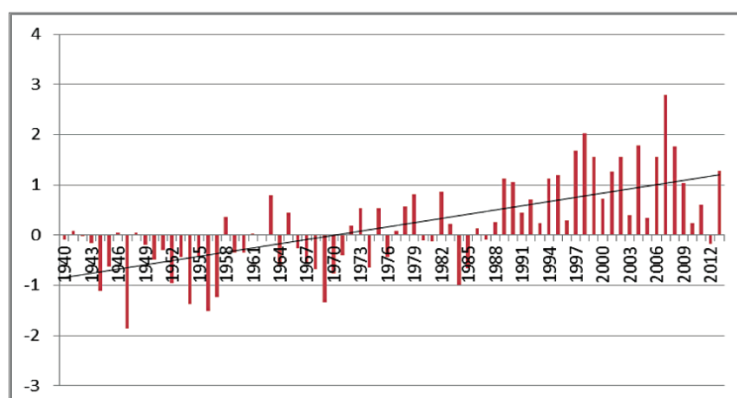


Figure 9. Deviations from the multi-year average (1961-1990) of the annual mean temperature in Mongolia (Ministry of Environment and Green Development, 2014)

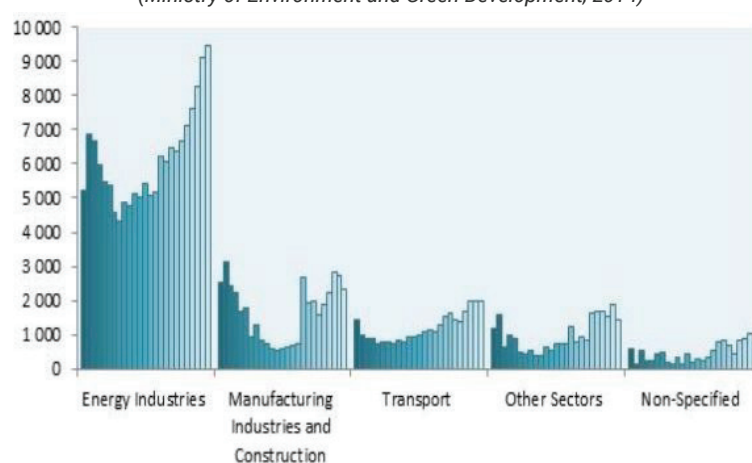


Figure 10. GHG emissions in Mongolia, trends by sector (1990-2014) (Government of Mongolia, 2017).

2.2 Exposure

Despite the historical tradition of nomadic pastoralism, the new emerging trends of exposure to hazards are not necessarily related to weather, but rather to unplanned urbanization on the peripheries of Ulaanbaatar (figure 11). Many factors contribute to the domestic migration towards urban centers, one of which dominates research; dzud losses and loss of livelihood options have been repeatedly mentioned as the main driver of the increased urban migration. More recent studies have also begun highlighting factors such as increasingly educated population which chooses to live near the urban regions due to the diverse opportunities, family obligations, to be closer to healthcare, or in consideration of the needs of children (International Organization for Migration, 2018).

Settling in at Ulaanbaatar has been made possible by the legislative provisions which guarantee that every citizen is allowed to own a plot up to 700 m² at no cost until very recently, when a migration ban was introduced in 2018 (Tsutsumida, et al., 2015). People have been setting up their gers on pieces of land without access to adequate infrastructure, services, sanitation or electricity, thus heightening their exposure to hazards.

While ger is considered sustainable and adequate for nomadic populations (Caldieron, 2013), when they occur in high densities, lack of official infrastructure creates problems. Severe air pollution is common during winter because the gers are heated up with wood or coal. Also, almost 95% of all ger households have on-site pit latrines and dispose their sullage in the street or sub-standard wastewater pits (The Asia Foundation, 2016). Thus, waste management is creating severe health issues as open latrines and dumpsites become dangerous, especially during flooding and heavy rain (Uddin & Gurberlet, 2018). WASH-borne diseases such as diarrhea, dysentery and Hepatitis A are the greatest sources of hazards to humans, and greywater poses a threat to the environment and groundwater (Uddin, et al., 2014).

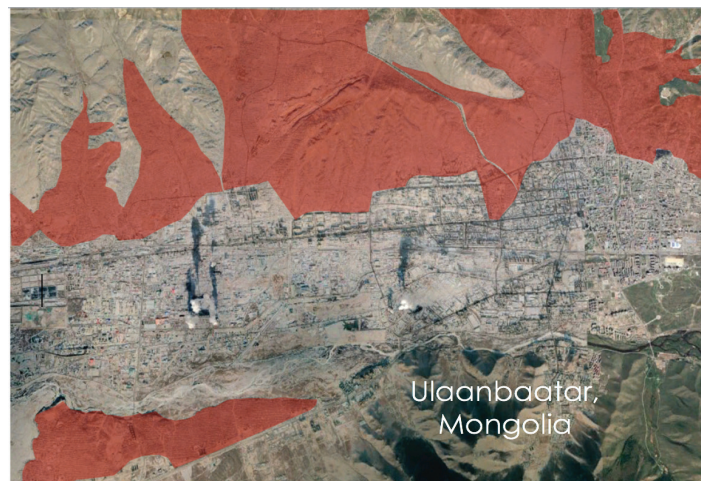


Figure 11. Semi-formal ger-settlements outside of Ulaanbaatar, Mongolia, highlighted in red (Google Maps, 2019)

Due to the lack of available land, and now that the migration ban has been introduced, new migrants are setting up their homes without official documentation on land that is not suitable for habitation; on hillsides, near gullies, and the outskirts of the city far away from services (International Organization for Migration, 2018). Without official guidance on regulation, migrants may choose lands which are prone to floods, other hazards and environmental degradation. It is in fact illegal to privatize lands in flood prone areas, but the communities have nevertheless been growing in regions which have a high risk for flash floods to occur due to lack of space (Saize, et al., 2017). The numbers of vulnerable housing in one study are increased by 311.1% between 2000 and 2008, with significant number located on steep slopes or in the immediate vicinity of rivers (Tsutsumida, et al., 2015).

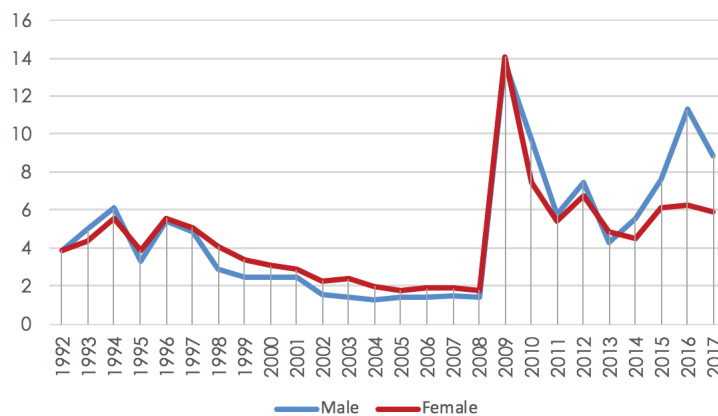


Figure 12. Unemployment in Ulaanbaatar, 1992-2017 (National Statistics Office of Mongolia, 2019).

2.3 Social Vulnerability

Disasters in Mongolia do not affect the population equally. For example, it has been illustrated that the dzuds are complex, multifaceted events which interact with physical, ecological, socio-economic and institutional factors (Fernández-Giménez, et al., 2012). Evidence suggests that families with large number of animals are more likely to recover quickly due to new births and the ability to sell, and they are more mobile because they do not have to worry about the cost of moving their herds (Oniki & Dagys, 2017). In other terms, the cost of risk management is high (Ahearn, 2017). Hence, small households cannot afford to grow their herds to increase personal resilience due to cost of fodder and family needs (Oniki & Dagys, 2017). As a result, low-income families are falling into poverty traps, are potentially facing a disaster if their herd is lost and are more likely to suffer from forced migration.

Also, the migration ban has affected urban migrants in unexpected ways. To regulate the urban migration to Ulaanbaatar, the government introduced a migration ban in 2017, which was further extended to 2020 to ensure that the capital city is given enough time to cope with the unplanned growth of the settlements. However, the ban did not stop urban migration per se – it has created a population of unregistered urban migrants who lack official resident status in the capital and thus are denied from accessing basic urban services such as schools, health care or social welfare (International Organization for Migration, 2018). Furthermore, unregistered citizens are less likely to access employment, and social workers are likely to be unaware of their needs because the unregistered migrants do not want to visit local administration of the khoroos in the fear of eviction. Thus, social and spatial inequalities are increasing, and growing unemployment (figure 12), discrimination, lack of services and lack of social networks contribute to increasing poverty, social exclusion and experiences of isolation in the ger-districts (Terbish & Rawsthorne, 2016), which then increase the vulnerability to hazards.

Gender discrepancies are also apparent in the capital. Women in the ger settlements are less likely to find employment – informal or otherwise – due to child-rearing duties and the high demands of seasonal manual labor (International Organization for Migration, 2018). This is partly due to the fact that unregistered migrants cannot access formal employment at all, but the conditions affect women disproportionately. Same process

applies to girls moving to access education; the families often move with the girls but due to their unregistered status, the youngest children cannot access the capital region's kindergarten care. Thus, girls are often forced to remain home to take care of their younger siblings instead of receiving formal education (International Organization for Migration, 2018).

2.4 Physical Vulnerability

Because earthquakes have been rare in the past, the population and the infrastructure are largely unprepared for severe seismic activity (CFE-DM, 2018). Also, harnessing of electricity in areas which lack infrastructure is done by tapping a connection illegally to a line on someone else's property (International Organization for Migration, 2018). Such connections may be haphazardly placed, which creates major safety hazards for the people in the vicinity. This is a severe concern given the fact that the ger settlements are highly flammable due to construction materials, and density of the buildings adds to the high risk of urban fire. The traditional heating methods using coal are also a likely source of large-scale conflagration during an earthquake when buildings are damaged by the seismic activity, allowing fires to spread (Government of Ulaanbaatar City & JICA, 2013). Many regions of the country are seismically active, and the three largest cities are located in the vicinity of sites which have the likelihood to experience large-scale earthquakes (CFE-DM, 2018).

When it comes to environmental degradation, the volume of wastewater far exceeds the physical and technical capacity of treatment plants which contributes to the process. Groundwater tables have been dropping for the last 50 years, the extraction rate exceeds natural recharge capacity, and pollution compromises the quality of available water resources (The Asia Foundation, 2016). Furthermore, the numbers of livestock alone, having crossed 66 million, are imposing immense stress to the environment; in 2014 most of the ecological zones in Mongolia were severely overgrazed (figure 13) (Gao, et al., 2015). Dzuds, droughts and fires further deplete resources available for these animals, creating a cul-de-sac for farmers in terms of sustainability. The ecological systems in Mongolia seem to be reaching their maximum carrying capacity. As explored earlier, the Mongolian ecological systems are very vulnerable; the rangelands are being destroyed at an increasing pace which results in the expansion of the true Gobi Desert (UNECE, 2018).

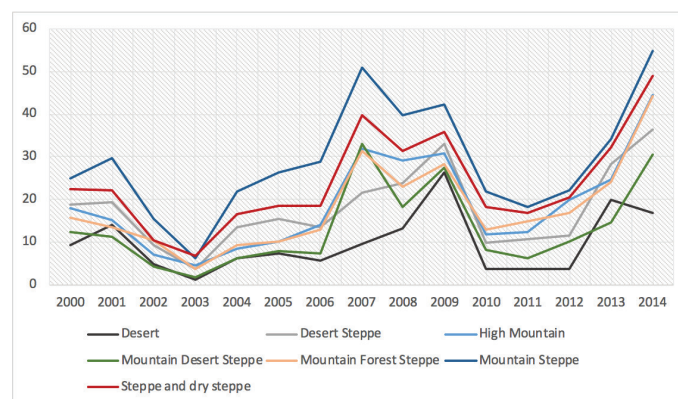


Figure 13. Percentage of land area, by year and ecological zone, having greater than 70% use of forage during 2000-2014 (Gao, et al., 2015).

2.5 Future of Disaster Risk

It is suspected that as a result of climate change, primary production and pasture biomass will decrease by up to 40%, forest fires will grow larger, glacier melt rate will increase by 67% by 2080, frequency of hazardous atmospheric phenomena could increase up to 60%, and animal losses by dzuds may increase an estimated 9.4% by 2050 (The Government of Mongolia, 2015). Climatic variations are also likely to increase heavy rainfalls and flooding, impair electricity infrastructure by breaking down transmission cables and systems by heavy snow and ice, and the operations of hydroelectricity plants may be hindered due to water regime changes (The Government of Mongolia, 2015). Lessened precipitation may also lead to increased dust storms. They largely correlate with times of low rainfall and dry ground conditions and are further enhanced by soil erosion in areas that host mining industries (Amgalan, et al., 2017).

Furthermore, it is likely that frequency of rain does not experience change, but the occasional rain will be increased in volume and intensity (Ministry of Environment and Green Development, 2014). Multi-day gentle rains are turning into heavy downpours lasting less than an hour, which have the potential to damage pastures, animals and gers (Goulden, et al., 2016), and indicate an increased risk of flash flooding. Finally, growing interest in artisanal mining poses similar risks to the informal mining communities. The work is seasonal, unregulated and dangerous (Munkherdene & Sneath, 2018), and creates a risk of injuries for both men and women who are often working together in the mines (High, 2012). The informal mining settlements are likely to pose similar environmental and health related problems as the ger-districts outside of Ulaanbaatar.

3. Disaster Risk Reduction and Climate Action Interventions

The complex interplay between the ecosystems, hazards, vulnerabilities, and exposure has impeded past advancements in implementing disaster and climate related policies, mechanisms or frameworks in Mongolia. However, through supporting cross-sector, comprehensive approaches which have received international support, the government has made significant progress in building the country's resilience and capacity as mandated by international agreements on disaster risk reduction and climate resilience.

3.1 Sendai Framework for Disaster Risk Reduction

Priority 1. Understanding Disaster Risk. All levels of official administration in Mongolia generally share a good understanding of disaster and climate risks, and various institutions have the mandate for data collection and hazard-forecasting (UNECE, 2018). However, risk assessments tend to be sector specific initiatives with a limited scope. The Disaster Research Institute carries out some multi-hazard risk assessments, but they do not extend to national or local levels, and do not cover all key sectors due to lack of systematically reported and analyzed hazard or vulnerability data (National Emergency

Management Agency, 2015). The disaster related data does not disaggregate disaster related injuries, deaths, damages, missing persons or the affected by sex, disability or income (The Government of Mongolia, 2017) which does not allow detailed vulnerability and risk analyses based on historical events.

However, disaster risk and vulnerability evaluations are still being conducted by professionals responsible for the regional or national disaster risk management according to the Law on Disaster Protection. In the fall of 2015, dzud risk maps were developed based on 15 factors which will be used to evaluate dzud risks, and to help in the making of risk informed decisions (NEMA; JICA, 2018). Spring floods are being combatted with on-site assessments to identify disaster prevention mechanisms and by developing recommendations. To further understand and prepare for earthquakes, the Government Resolution 282 in 2010 provided detailed studies in seismically active zones in Ulaanbaatar, required the establishment of seismological observation points on active faults and mandated resourcing of the funds for procurement of equipment and tools required for earthquake risk management from the Reserve Fund (NEMA; JICA, 2018). In the Ger settlements, The Urban Migrant Vulnerability Assessment is the first study of its kind conducted by the IOM with the support of Ger Community Mapping center to further understand the vulnerabilities of urban migrants (International Organization for Migration, 2018).

Priority 2. Strengthening Disaster Risk Governance to Manage Disaster Risk.

Mongolia has made significant progress in implementing a strong legislative framework for DRR and climate adaptation activities within a relatively short time span. The foundations for DRR in the country are collated in table 1. Disasters were specifically addressed by the government in the 2003 parliament Law of Mongolia on Disaster Protection, where matters and roles relating to disaster protection were entrusted to state organizations, local authorities, NGOs, to the private sector and individuals (Government of Mongolia, 2003). It also mandated that information related to disaster and disaster activities should be made public, and that a nation-wide disaster communications network will be established to enhance disaster protection measures through disseminated news, information and warning signals (Government of Mongolia, 2003).

The newly amended Law on Disaster Protection of 2017 introduced an approach which focused on disaster prevention, risk reduction, mitigation and resilience as opposed to response-oriented mechanisms. The law is further supported by projects and government resolutions which enhance autonomy of, and grant responsibilities to the local governments and private sector. Local authorities are responsible of their disaster management plans, initiatives, and local services by supporting cross-sector cooperation.

Local disaster management departments, operating under NEMA, support the implementation of Law on Disaster Protection and other policies intended to improve the official disaster governance (CFE-DM, 2018). The roles of local governments, NGOs and the public in the official DRR structure have been further reinforced with additional programs and mechanisms which support participation. For example, the National Program of Community Participatory Disaster Risk Reduction (2015) aimed to promote the participation of citizens in capacity building activities and trainings to promote life skills and climate adaptation (NEMA; JICA, 2018). The Memorandum of Cooperation (MoC) aimed to support the inclusion of NGOs through training of instructors and by supporting participatory approaches. Also, three largest cities (Darkhan, Erdenet and

Ulaanbaatar) have joined the global “Making Cities Resilient: My City is Getting Ready” campaign (UNECE, 2018), which further illustrates the efforts of integrating DRR into local development policies and action plans at the city levels. However, despite the progress Mongolia has made in supporting disaster risk reduction through a strong legislative framework, the legal and institutional environment for DRR has not been established successfully at all levels (National Emergency Management Agency, 2015).

When it comes to political participation and inclusion of women in the official government structure, issues endure despite the legislative endeavors and initiatives striving towards improving gender equality. While the indices measuring equality are above global average, indicating progress which is further supported by legislative provisions such as the 2011 Law on Promoting Gender Equality, underrepresentation of women persists. The socialist regime left behind institutional systems which categorically excluded women from decision-making positions – a tradition that has been carried on to modern day (UNDP, 2011). Lack of representation of women in politics is a prevailing issue (UNECE, 2018).

IMPLEMENTATION	LEGISLATION	SCOPE	PURPOSE
THE GOVERNMENT OF MONGOLIA	The Constitution of Mongolia (1992)	National, districts and municipalities	Guarantees the rights of citizens to live in safety from harm, protected against pollution and ecological imbalance. The foundation of disaster related policies.
THE GOVERNMENT OF MONGOLIA	Concept of National Security of Mongolia (1994)	National, district and municipalities	Requires the establishment of prevention and response mechanisms to protect the national security from disaster threat.
THE GOVERNMENT OF MONGOLIA	Law of Disaster Protection (2003)	National, district, municipalities, and the private sector	Intended to regulate matters and clearly assign responsibilities related to disaster protection to state agencies, NGOs, local authorities, and the private sector.
THE GOVERNMENT OF MONGOLIA	Concept of National Security of Mongolia (2010)	National, districts and municipalities	The updated concept highlighted efforts to strengthen the DRR mechanism and to reduce vulnerabilities by encouraging participation and increasing capacity at all levels.
NEMA, LOCAL GOVERNMENTS	State Policy and Programme on Disaster Protection (2011)	National, districts and municipalities	Intended to support sustainable development and to strengthen the DRM system by guaranteeing education and participation of all sectors and citizens.

IMPLEMENTATION	LEGISLATION	SCOPE	PURPOSE
LOCAL GOVERNMENTS	National program of Community Participatory Disaster Risk Reduction (2015)	Municipalities	Aims to achieve enhanced DRR activities aligned with SFDRR via community participation, capacity training, climate change adaptation and training at the localities.
THE GOVERNMENT OF MONGOLIA	Policy of Sustainable Development in Mongolia 2030 (2015)	National, districts and municipalities	Aims to achieve enhanced DRR and disaster protection activities aligned with SFDRR and other national mechanisms.
THE GOVERNMENT OF MONGOLIA	Mid-term Strategy to Implement the Sendai Framework for Disaster Risk Reduction in Mongolia (2017-2030)	National, districts	Strives towards gradual implementation of the SFDRR in Mongolia at national and regional levels by establishing measurable objectives and indicators.
THE GOVERNMENT OF MONGOLIA, MONGOLIAN RED CROSS SOCIETY	Amended Law on Disaster Protection (2017)	National, districts, municipalities, NGOs, the public and the private sector	Aims to strengthen the DRR framework and move towards a more proactive approach.

Table 1. Mongolia's legislative frameworks for disaster risk reduction and climate resilience.

Priority 3. Investing in Disaster Risk Reduction for Resilience. Budget authority for government's activities has been centralized under the Treasury Single Account System, which led the accounts of public entities to be governed by the Ministry of Finance, granting the ability for stricter monitoring of governmental expenditure (CIP, 2018). The expenditure is dictated by the national investment plan, which allocates the state budget for individual sectors. They consider costs related to disaster prevention, risk reduction, response and recovery, but the budgeted amount for activities has been relatively small (Amgalanbayar, 2011). Focus has been on recovery measures after a disaster hits, and financing has been drawn from the reserve funds. Apart from the central government, individual sectors have not had reserves and resources set aside for disaster reduction activities in the past (Amgalanbayar, 2011). The issue persists today; certain amount of money is allocated to local governments from the Reserve Fund; however, most of it is spent on direct disaster relief and recovery, and insufficient financial resources prevent the implementation of disaster risk reduction plans (National Emergency Management Agency, 2015).

To reduce vulnerabilities and to alleviate poverty, Mongolia has established a mechanism for enhancing social protection in the form of a social welfare system, which consists of 71 different programs managed by the Ministry of Population Development and Social Protection. The system covers social pensions and cash transfers to citizens with special needs, such as people with disabilities or who lack family connections and provides child support to poorer households (Asian Development Bank, 2016). The combined amount of funding amounted to 2.7% of GDP in 2015, and it was complemented by Food Stamp Program which had 144 000 beneficiaries to support

families living in extreme poverty (Asian Development Bank, 2016). The Child Money Program, accounting for half of the welfare payments, provides approximately \$20 to roughly 1 million children below 18 years. These activities are drawing funds from the Human Development Fund, which in turn is using mining revenues to further support human development (Asian Development Bank, 2016).

Government of Mongolia has also adopted a new insurance scheme with the support of the World Bank to aid herders to combat disaster losses. The program is a tripartite between self-insurance, market-based approach and social safety net, where small losses are herders' responsibility, private industry covers larger losses, and only catastrophic losses are borne by the government (The World Bank, 2015). Due to the cost of the scheme, it is possible that the low-income households with small herds do not have access to the program.

Priority 4. Enhancing disaster preparedness for effective response to “Build Back Better” in recovery, rehabilitation and reconstruction. Currently, Mongolia does not have a post-disaster recovery program; however, the State Reserve Department under NEMA is responsible for conducting all recovery activities (National Emergency Management Agency, 2015). This is largely due to the lack of available funds for all operations, which is restricting recovery activities across the country. Thus, emergency preparedness and response capacities tend to be higher at the national level, while the local levels are often being supported by NGOs and international organizations to support the government's efforts to manage disasters (UNECE, 2018). Recovery programs and initiatives in the past have been conducted with the support of NGOs, such as People in Need, the IRFC and the Mercy Corps.

To further support the work of NGOs in the country, the government included a new chapter about International Human Assistance into the 2017 Disaster Protection Law, according to which all aid and services must meet the needs of affected populations and abide by the standards of humanitarian aid (CFE-DM, 2018). Furthermore, discrimination by ethnicity, nationality, religion, gender, sexual orientation, disability, age or political affiliation is made illegal in the dissemination of aid (CFE-DM, 2018). Additionally, seeking financial profits when providing assistance was prohibited (Kelly, 2014) to reduce the risk of corruption.

Early Warning Systems in Mongolia are transmitting information about seismic activity and weather forecasts through different platforms, including internet, mobile phone services, national radio and television. NEMA is able to disseminate warning messages easily to provinces and soum levels – however, it is difficult to reach remote herder communities despite the far-reaching cover of the current initiatives (CFE-DM, 2018). Early warning systems have been also developed jointly with other stakeholders such as the Mercy Corps (See chapter 4). Earthquake Disaster Warning System, funded by the GoM was established between 2012-2014 with the objective to disseminate warnings via 60 siren towers in Ulaanbaatar, three television networks and nine radio stations (National Emergency Management Agency, 2015).

Furthermore, mobile control center has been utilized in case EWS become inoperable, and Earthquake Sensor Devices have been connected with satellites. Warnings will be directly delivered to mobile phones via Mobicom, Skytel, Unitel, G-Mobile, Orbitnet and radio stations for further public notification (Zoljargal, 2014).

4. Coherence with the Sustainable Development Goals & the Paris Climate Agreement

By the year 2030, Mongolia aspires to be among the leading middle-income nations with a society consisting of middle and upper-middle income classes, with a focus on preserving ecological balance (The Government of Mongolia, 2016). The sectoral progress is measured via phased four-year objectives between 2016-2020, 2021-2025 and 2016-2030. Guidelines for socio-economic development and the implementation of SDG informed policies are rooted into the Law of Mongolia on Development Policy Planning, which is used to outline rights, duties and the responsibilities of stakeholders to achieve uniformity and continuity in policy planning. Currently, Mongolia is well on track with the progress, monitoring and implementation of the SDGs (UNECE, 2018).

To aid in the implementation of Sustainable Development Goals into national, sectoral and cross-sectoral policies and programs, Mongolia has developed a phased strategy and guideline for reviewing and identifying policy documents that require revision, monitoring and evaluation to achieve the graduation (National Development Agency, 2017). It is complemented by national Decree 44, in which responsibilities over achieving specific goals are allocated to ministries accountable of the thematic area (e.g. responsibility over achieving goal 1, no poverty, has been allocated to the ministry of Labor and Social Protection), and a working group has been working on identifying specific methodologies for implementation (National Development Agency, 2017). Furthermore, issues are being prioritized with suggested solutions according to their solvability to minimize the amount of unproductive effort in the implementation process. National Security Concept in 2010 aimed towards understanding environmental security as a matter of national security, requiring the country to combine principles of meeting basic human needs within limits of natural resources (UNECE, 2018). It was another illustration of coherence between the environment and sustainability, aiming towards understanding the interactions of human and ecological systems as a whole.

When it comes to climate change, the country has implemented the National Green Development Policy (NGDP) of 2014 to promote recycling, sustainable resource utilization, green investments and environmentally friendly production, objectives which are illustrated in the country's master plans as well. NGDP also works as a foundation for the Intended Determined Contribution of Mongolia to the Agreement on Climate Change (The Government of Mongolia, 2015) which outlines measures to achieve the targets to reduce national GHG emissions by 14% by 2030. Mongolia has also implemented the Green Development Strategic Action Plan for Ulaanbaatar (2020) which is aiming towards reducing air pollution, enhancing sustainable transport, as well as improving waste management, water security and climate resilience among other objectives. This plan has been established to create coherence between the NGDP, 2020 Master Plan and Development Approach for 2030, and the Economic Development Strategy of 2015 (The Asia Foundation, 2016). The main goal of the GDSAP is to support the mainstreaming of green development strategically in all of the aforementioned plans.

Sectoral Aim	Policies with Linkages to Sendai Framework for Disaster Risk Reduction	Policies with Linkages to Sustainable Development Goals	Policies with Linkages to the Paris Climate Agreement or Environment
National Development	Main Action Program of the Government of Mongolia for 2016-2020 Policy for Sustainable Development in Mongolia for 2030 (2015)	Increase the rank on Environmental Performance Index from 111 to 90 Area of Specifically Protected Land raised from 17,4% to 30%	National Programme on Reduction of Air and Environmental Pollution 2017-2015 National Green Development Policy of 2014
Agriculture & Mining	Environmental Impact Assessment Law (2012)	Have no less than 60% of Mongolia free from livestock disease Reduce land deterioration and erosion Ensure a stable investment in the environment in the mining sector	Environmental Protection Law (2012) Law on Prohibition of Mineral Exploration and Mining Activities in areas in the Headwaters of Rivers, Protected Water Reservoir Zones and Forested Areas (2009)
Disaster and Climate Risk Reduction	National Security Concept (2010) National Programme of Community Participatory Disaster Risk Reduction (2017) Mid-term Strategy to Implement the Sendai Framework for Disaster Risk Reduction in Mongolia (2017-2030)	Reduce the GHG emissions by 14% Implement a strategy to reduce the impacts of CC, land deterioration and to reduce the loss from disaster risks	Law on air Pollution (2010) Intended Nationally Determined Contribution of Mongolia to the Agreement on Climate Change (2015)
Vulnerability Reduction	State Policy on Disaster Protection (2011) National Security Concept (2010) Amended Law on Disaster Protection (2017)	Share of population with social insurance coverage in the economically active population to 99% Reduce poverty rate to 0 Create a national long-distance health network covering all Soums	National Action Programme on Climate Change NAPCC (2011-2021)

Sectoral Aim	Policies with Linkages to Sendai Framework for Disaster Risk Reduction	Policies with Linkages to Sustainable Development Goals	Policies with Linkages to the Paris Climate Agreement or Environment
Urban Development	National Development Strategy for 2021 (2007) Main Action Program of the Government of Mongolia for 2016-2020 Policy for Sustainable Development in Mongolia for 2030 (2015)	Ensure that 90% of the population is supplied with safe drinking water Improve the legal environment for urban and land development Enforce green development, reduce heat-loss in buildings by 40% Raise the share of households using reliable electricity to 100%	Water National Programme (2010-2015 and 2016-2021) Green Development Action Plan for Ulaanbaatar (2020) Main Action Program of the Government of Mongolia for 2016-2020

Table 2. Some of the synergies between international agreements and different policies and commitments of Mongolia in various sectors.

5. Issues in Implementation of the DRR and Climate Policy

Mongolia is still facing challenges in policy implementation. For example, many of the existing policies are not aligned with the national disaster risk reduction policy, and despite succeeding to mainstream green development, a state policy for streamlining and combining policies for systematic DRR is missing (National Emergency Management Agency, 2015). The sheer number of policies, guidelines, programs and mechanisms developed within a short time span hinders the effective mainstreaming of DRR due to arising confusion over overlapping responsibilities. Development strategy and accompanying documents have been drafted and revised multiple times in a short time span, which contributes to the ambiguity among stakeholders about long-term policy implementation (UNDP, 2011).

Lack reliable and updated data about specific vulnerabilities further hinders the processes of urban planning and disaster response, especially in the context of providing services and infrastructure for the ger settlements (International Organization for Migration, 2018). The future improvement of data management systems has been stated to require capacity development, financial support and technology transfers (The Government of Mongolia, 2017). In the case of laws and policies relating to land allocation and housing, they do not recognize the rights of migrants without legal residency, lack safeguards to protect people from homelessness, as well as lack clarity on future of redevelopment (Amnesty International, 2017).

6. Stakeholder Analysis

A number of stakeholders in Mongolia have played a crucial role in protecting the population from disasters and climate change, and by supporting the government during the response phases of large-scale disasters in the past. To further strengthen the domestic DRR capacities for conducting activities and utilizing equipment, projects have been steered jointly with United Nations Development Programme, Asian Development Bank, World Bank, Japan International Cooperation Agency, International Federation of the Red Cross and Red Crescent Societies, United Nations Office for Disaster Risk Reduction and the Asian Disaster Preparedness Center, among others.

Mongolian Red Cross Society is one of the largest humanitarian organization in Mongolia, providing service and assistance to vulnerable populations through volunteering networks. Its operations are further supported by the Law on Legal Status of Mongolian Red Cross Society, which highlights the roles and responsibilities of MRCS in times of adversity, and clarifies its position as the government's auxiliary (CFE-DM, 2018).

World Vision's work is covering all provinces of the country. They aim to protect children from violence and exploitation, strive towards diversifying the income of poorest households, aim to improve food security, and enhance the preparedness for dzuds across all regions (World Vision, 2019). They have also helped in implementing a national program on community-based risk reduction, within which 507 trainers were prepared to conduct participatory vulnerability and capacity assessments.

The Asia Foundation was the first NGO invited into Mongolia in 1990. They have worked to reduce corruption, improving the governance of cities, to increase gender equality and to advance sustainable resource utilization in consideration of environmental consideration in the country (The Asia Foundation, 2019). Similarly, Mercy Corps have worked to strengthen anticorruption initiatives and to improve administrative reforms at the local levels. Furthermore, they contribute in increasing the income of herders and entrepreneurs by providing connections (Mercy Corps A, 2019). Also, they have been supporting early warning systems in Mongolia by Livestock Early Warning System (LEWS) project, which develops risk management technologies to provide early warnings for rural herders and livestock entrepreneurs in all regions of the country (Mercy Corps B, 2019).

Mongolia has also joined the International Organization for Migration as a member in 2008. IOM has supported the country to better understand domestic migration processes and conducted vulnerability assessments in the ger settlements with the support of the Ger Community Mapping Center and the National University of Mongolia (IOM, 2019). They have also worked to prevent trafficking in support of the Mongolia's 2012 Anti-trafficking Law and helped to understand processes related to climate and disaster related migration which drive rural populations towards urban centers. Specifically, IOM focused on capacity building to improve coordination of onsite responses and helped to improve the GoM's efficiency in providing of shelter and amenities to rural households to minimize forced migration (IOM, 2019).

7. Future Priorities

7.1 Challenges

The Mongolian society is expected to undergo a transition through a rapid political social and economic development to create prosperous middle-income society, founded on sustainability and environmental conservation. Sustainable development, climate resilience and disaster risk reduction have been supported with an increased, significant momentum in political will to guarantee the expected outcomes for 2030.

However, sustaining this momentum requires major contributions from a range of stakeholders, as the government's budget still remains inadequate to cover all sectors, especially during large-scale disaster response. Furthermore, the budget and economy are largely tied to the booming mining industry, which is still threatened and destabilized by lack of technical infrastructure, mainly roads and electricity production. Conversely, developing the energy sector is likely to increase the production of GH gases, which is already the biggest contributor to increasing emissions. Rapid growth vis-à-vis sustainable development remains to be an unresolved conundrum, especially when the concerns have already been raised about the environmental and social impacts of investing in massive-scale mining. People's livelihoods are also further impacted by the societal transition, leaving herders landlocked as property is increasingly privatized, which drives population towards employment and opportunities at the capital regions.

However, as a result of these complex processes, unemployment and unofficial employment are rapidly increasing across the country, both of which remain as issues that the government has to rapidly solve. Informal miners and unregistered citizens (especially women and girls) are currently facing increasing exposure, lack of opportunities, lack of access to healthcare and social support; factors that contribute to their mounting vulnerabilities.

Unplanned urbanization processes in Ulaanbaatar are also forming a major risk to the populace. Lack of infrastructure and the following environmental degradation, as well as exposure to flooding, earthquakes and conflagration in the ger-districts remain as major concerns. The recent migration ban, intended to slow down the growing settlements, only increased vulnerabilities by creating a demographic hidden from the public administration.

The future development discourse is also highly dependent on the effects of climate change. A large portion of the economy is still tied to animal products, which are currently threatened by environmental degradation, variations in the climate and increased hazards such as dzuds and droughts. Measures have to be taken to safeguard the nomadic populations, which requires not only significant investments to insurance schemes, as well as preparedness and response initiatives, but also increased legislative measures to recognize their rights and role in the society alongside industrial development.

7.2 Priority Issues

Mongolia has committed to achieving the intended development targets by 2030 and is well on track in the process of achieving them with a clear, phased approach. Significant efforts have been made to streamline green development into all policies and initiatives. However, similar achievements for mainstreaming DRR are still missing. Combining the disaster management policies, frameworks and mechanisms in a coherent manner should be the governments next priority target for the upcoming years. Institutional arrangements also require clarification in terms of responsibilities, as many of the current policies are creating overlapping roles in the same fields of work across sectors.

Lack of comprehensive disaster data required for developing multi-hazard risk and vulnerability assessments is also a significant issue to be solved. Lack of technical capacity and resources prevents the actualization of disaster data collection initiatives, and the government may require external support, capacity development and investment from stakeholders. For example, local NGOs, such as the Ger Community Mapping Center are already working on the ground, providing crucial information about the vulnerabilities and exposure in the ger settlements, and could further benefit from support. Similarly, the availability and collection of SADD data should be enforced through capacity building and by creating coherent disaster information management systems which support the utilization of information at all levels.

Also, issues related to the unplanned growth of Ulaanbaatar Ger-settlements and immigrants without official resident status must be addressed rapidly. Currently, the numbers of vulnerable populations are growing in a setting which is increasingly exposed to plethora of hazards, including urban fires, seismic activity, flash flooding and epidemics due to lack of infrastructure and resilient planning. Significant investments, vulnerability and risk assessments and planning are required to transform the informal settlements into sustainable, resilient and prosperous neighborhoods – yet, given the scale of the settlements, the process is likely to be slow. Furthermore, supporting the citizens and households living in poverty through social protection systems and welfare services must be reinforced to guarantee their continuity even in times of adversity. Sometimes, large-scale disasters can create immense fiscal burden for the government, and recovery activities in the past have consistently required stakeholder support and intervention, especially at the local levels. Thus, the coverage of insurance schemes and social welfare could be expanded and planned in a resilient, sustainable manner which guarantees access even for the poorest demographics. In this context, official, government-led post-disaster recovery program, drawing learnings from the past post disaster needs assessments, could be immensely useful to further safeguard the population and economy from future shocks.

Localization of DRR and CR to community and household levels is also an elemental aspect of reducing disaster risks in a setting which is constrained by lack of financial resources, capacity and remoteness. It is established here that the government has sometimes faced difficulties in managing disasters due to their massive scale – thus, preparing communities and equipping them with adequate means to protect themselves from the adverse impacts of extreme events and livelihood losses is crucial to aid the government's and stakeholders efforts to mitigate impacts and conduct recovery. For example, subsidies could be explored as an option for low-income herders with smaller flocks, and the operations of the "ninja-miners" should be carefully monitored to guarantee their safety and adequate working conditions as well.

Moreover, options for diversifying the economy could be beneficial to reduce the degradation of ecological systems associated with massive herd sizes, overgrazing and industrial activities. Mining operations (which is among the largest sources of income for the government to support social welfare) are still vulnerable to large-scale events and contribute to on-going processes of land degradation which threaten the fragile natural systems. If left unmanaged, these trade-offs between growth and sustainability may only worsen the impacts of hazards and climate change in the future. Indeed, a paradox is currently under formation between sustainable development and rapid economic growth, further stressed by the pressures of climate change, increasing poverty and disaster risks. Careful, deliberate planning is crucial to solve the issues in energy production and industrial development in a manner which does not compromise the ecological systems, and to regulate the growing numbers of livestock in regions which are facing degradation.

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