MONGOLIA

DIAGNOSIS OF CAPACITIES TO MANAGE CLIMATE AND DISASTER RISK

2024

The CADRI Partnership is a global UN led partnership that works towards strengthening countries' capacities to pursue integrated and coherent solutions to reduce disaster and climate risks across the Sustainable Development Goals (SDGs).

This report presents the findings and recommendations of the Diagnosis of National and Local Capacities to manage Disaster and Climate Risk in Mongolia conducted in 2023. The analysis was subsequently complemented with additional technical inputs and updates collected until early 2024.

Design: Caren Achieng

This report presents the findings and recommendations of the Diagnosis of National and Local Capacities to manage Climate and Disaster Risk in Mongolia conducted in 2023 under the leadership of the National Emergency Management Agency of Mongolia (NEMA) in close collaboration with the Office of the United Nations Resident Coordinator, with the support of the United Nations Country Team in Mongolia and the CADRI Partnership.

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ABBREVIATIONS

Abbreviation	Full Form
ADB	Asian Development Bank
ADRC	Asian Disaster Reduction Centre
AI	Artificial Intelligence
ALAMGaC	Agency for Land Administration and Management, Geodesy and Cartography
AMR	Antimicrobial Resistance
B.A.	Bachelor of Arts
CADRI	Capacity for Disaster Reduction Initiative
CBDRM	Community-Based Disaster Risk Management
CC	Climate Change
CCA	Climate Change Adaptation
CCCM	Camp Coordination and Camp Management
CCTV	Closed-Circuit Television
CHP	Combined Heat and Power
CHS	Core Humanitarian Standard
CMA	China Meteorological Administration
COMS	Korea's Communication, Ocean, and Meteorological Satellite
CRI	Climate Risk Index
CRP	Catastrophic Risk Pool
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DB	Database
DEFRA	Department for Environment, Food, and Rural Affairs
DP	Disaster Preparedness
DPP	Disaster Protection Plan
DR	Disaster Risk
DRA	Disaster Risk Assessment
DRF	Disaster Recovery Framework
DRM	Disaster Risk Management
DRMD	Disaster Risk Management Department
DRM/R	Disaster Risk Management and Reduction
DRR	Disaster Risk Reduction
DTM	Displacement Tracking Matrix
ECF	Environment and Climate Fund
ECMWF	European Center for Medium-range Weather Forecasts
EDC	Energy Development Centre

Abbreviation	Full Form
EIA	Environmental Impact Assessment
ENVI	Environment for Visualizing Images
EOC	Emergency Operation Centre
EOS	Emergency Operation Staff
ERC	Energy Regulatory Commission
ESG	Environmental, Social, and Corporate Governance
EU	European Union
EWAR	Early Warning and Response
FAO	Food and Agriculture Organization of the United Nations
FY-series	Fengyun series (Chinese meteorological satellites)
GABPM	General Authority for Border Protection of Mongolia
GCF	Green Climate Fund
GCM	General Circulation Model
GDP	Gross Domestic Product
GEF	Global Environment Facility
GEMP	Good Emergency Management Practices
GIS	Geographic Information System
HSP	Humanitarian Standards Partnership
IAG	Institute of Astronomy and Geophysics of Mongolian Academy of Sciences
IBLI	Index-based Livestock Insurance
ILO	International Labour Organization
INFORM	Index for Risk Management
INGO	International Non-Governmental Organization
INSARAG	International Search and Rescue Advisory Group
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
IRA	Initial Rapid Assessment
IRIMHE	Information and Research Institute of Meteorology, Hydrology and Environment
ISO	International Organization for Standardization
IT	Information Technology
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau (German Government-owned Development Bank)
KMA	Korea Meteorological Administration
LCDRR	Local Councils for Disaster Risk Reduction
LDF	Local Development Fund
LEC	Local Emergency Commission

Abbreviation	Full Form
LEGS	Livestock Emergency Guidelines and Standards
LEMA	Local Emergency Management Authority
M.A.	Master of Arts
MAHIS	Mongolian Animal Health Information System
MCUD	Ministry of Construction, Urban Development
MET	Ministry of Environment and Tourism
MFA	Ministry of Foreign Affairs
MIRA	Multi-Sector Initial Rapid Assessment
MLSP	Ministry of Labour and Social Protection
MODIS	Moderate Resolution Imaging Spectroradiometer
MoFALI	Ministry of Food, Agriculture, and Light Industry
MNS	Mongolian National Standard
MNT	Mongolian Tugrik
MoE	Ministry of Energy
MOE	Ministry of the Environment
MOES	Ministry of Education and Science
MOF	Ministry of Finance
MOH	Ministry of Health
MRCS	Mongolian Red Cross Society
MSK	Medvedev–Sponheuer–Karnik scale
MW	Megawatt
NAMEM	National Agency for Meteorology and Environmental Monitoring
NAPCC	National Action Programme on Climate Change
NCC	National Climate Committee
NCCCD	National Committee for Climate Change and Desertification
NDC	National Determined Contribution
NDVI	Normalized Difference Vegetation Index
NEMA	National Emergency Management Agency of Mongolia
NFI	Non-Food Item
NGO	Non-Governmental Organization
NRM	Natural Resource Management
NSO	National Statistics Office
O&M	Operations and Maintenance
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PDNA	Post Disaster Needs Assessment
PES	Payment for Ecosystem Services
Ph.D.	Doctor of Philosophy
PUA	Pasture User Agreement

Abbreviation	Full Form
QGIS	Quantum Geographic Information System
R&D	Research and Development
RBA	River Basin Authority
RBM	River Basin Management
RCI	Resilience Capacity Index
RCP	Representative Concentration Pathway
RIMA	Resilience Index Measurement and Analysis
RR	Risk Reduction
SAR	Search and Rescue
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
SEC	State Emergency Commission
SFDRR	Sendai Framework for Disaster Risk Reduction
SIDS	Small Island Developing States
SNIP	System of Norms and Standards (Russian Design Code)
SPA	Special Protected Areas
SPEI	Standardized Precipitation Evapotranspiration Index
SRTM	Shuttle Radar Topography Mission
TAD	Transboundary Animal Disease
UB	Ulaanbaatar
UBF	Ulaanbaatar Fault
UN	United Nations
UNCCA	United Nations Common Country Assessment
UNCT	United Nations Country Team
UNDAC	United Nations Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNRCO	United Nations Resident Coordinator's Office
UNSDCF	United Nations Sustainable Development Cooperation Framework
USD	United States Dollar
VI	Vulnerability Index
VMS	Vehicle Movement System
WASH	Water, Sanitation, and Hygiene
WMO	World Meteorological Organization
WRF	Weather Research and Forecasting

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FOREWORD

In collaboration with the State Emergency Commission (SEC) the National Emergency Management Agency (NEMA), the National Council for Disaster Risk Reduction of Mongolia, the Resident Representative and specialized agencies of the United Nations in Mongolia, the Capacity for Disaster Reduction Initiative (CADRI) Partnership team, successfully carried out an assessment of Mongolia's capacities for Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) in Mongolia.
I would like to extend my profound gratitude to the CADRI Partnership, which comprises international government and non-government bodies, and to the United Nations for their leadership and coordination in undertaking this important initiative.

Climate change is becoming a pressing challenge throughout the world. Given the impacts of climate change on the frequency and intensity of natural and climate related disasters and the exacerbation of socio-economic vulnerabilities, the Government of Mongolia is determined to enhance the coherence of its policy, activities and governance structures and to launch comprehensive measures for climate change adaptation, disaster risk reduction, and damage mitigation.

Within this very scope, an assessment of Mongolia's capacities to manage disasters and adapt to climate change has been initiated to strengthen disaster risk reduction efforts triggered by climate change, ensuring public and economic preparedness and early warning capabilities.
The CADRI Partnership's evidence-based assessment will become a substantive impetus for the implementation of tasks set out by the joint Government known as "One Standard for One Country", in order to upgrade resilience, economic and infrastructure capacity, social awareness, and individual citizen's involvement and responsibility.

It is a matter of satisfaction to note that shortly after NEMA's establishment in 2004, Mongolia requested UNDAC to conduct an assessment of its newly established institution's organizational setup and operation capacity, which played an important role in shaping the national strategy for disaster management. CARDI's recommendations based on the present assessment, two decades after the first one, will be a valuable input in strengthening Mongolia's preparedness against climate and disaster risks and enhancing the capacity of all stakeholders involved in their reduction.

The growing frequency, variety, and intensity of disasters, along with their increasingly negative impacts on communities, the economy and the natural environment, indicate the urgent necessity to strengthen disaster resilience at both national and local levels.

Mongolia's long-term policy document, "Vision 2050" emphasizes disaster risk reduction so that the Sendai Framework has successfully been implemented under the national mid-term strategy for disaster risk reduction up to 2030. It is increasingly essential to ensure the seamless coordination of activities and capacity building despite considerable accomplishments made in disaster protection and public awareness

Therefore, disaster risk reduction and climate change adaptation require all-encompassing efforts involving institutions and individuals at national, regional, and international levels.

My heartfelt thanks to all institutions and stakeholders for their meaningful cooperation and contributions to this assessment. By integrating its conclusions and recommendations into our

activities, I am confident that we shall achieve significant progress in disaster risk reduction, allocate required resources for climate change adaptation, improve disaster preparedness, mitigate damages, and enhance intersectoral coordination.

I wish continued success and well-being to everyone who participated in the assessment of capacities to manage climate and disaster risks.

May tranquility prevail in the world.

S. Amarsaikhan

MP,
Deputy Prime Minister,
Deputy Head of the National Council for Disaster Risk Reduction,
Head of Emergency Commission,
Head of the National Committee on Climate Change

FOREWORD

With the average global temperature increase already reaching 1.1°C, climate change is rapidly altering the risk profile of our planet. This shift is magnifying the magnitude, frequency, and severity of disasters, as evidenced by the doubling of extreme weather events over the past two decades. Mongolia is no exception to this trend. The country is susceptible to multiple natural hazards such as dzuds, dust storms, snowstorms, droughts, floods, steppe fires and earthquakes. Over the last 80 years, Mongolia's climate has significantly warmed, surpassing the global average with a rise in surface temperatures by 2.25°C. This warming has led to a 2.9-fold increase in climate-related phenomena between 2015 and 2021, resulting in losses and damages totaling 394.6 billion MNT (excluding the COVID-19 pandemic) over seven years*.

In 2004, the United Nations Disaster Assessment and Coordination (UNDAC) team conducted a comprehensive assessment of the national capacity to respond to natural and manmade disasters. This assessment significantly influenced the development of the current national disaster response structure. Shifting from disaster response to resilience is key to sustainable development. Building resilience through a holistic and system-wide approach is crucial, as it mitigates loss and damage, saves numerous lives, and significantly reduces funding requirements during disaster response efforts. Recognizing this urgent need, UN Mongolia mobilized the Capacity for Disaster Reduction Initiative (CADRI) Partnership at the request of the Government of Mongolia. CADRI is a global partnership composed of 20 UN and development organizations that collaborate to help countries reduce disaster and climate risks by providing comprehensive assessments and actionable recommendations to governments.

In September 2023, the CADRI team conducted an in-depth analysis to evaluate Mongolia's capabilities in handling climate and disaster risks. The focus was on providing practical advice to improve early warning systems, disaster readiness, and risk mitigation strategies across essential socio-economic sectors. The assessment covered multiple sectors including agriculture, environment, infrastructure, education, social protection, and human mobility. For each sector, the team analyzed five critical areas: governance, implementation capacity, financing, knowledge, and technology and equipment. This comprehensive analysis enabled the team to identify the country's strengths, gaps, and challenges, and provided actionable recommendations tailored to the specific needs of each sector.

I hope this assessment will serve as a guiding tool for the Government of Mongolia and all stakeholders in shaping future policies and programme interventions, strengthening cooperation at national, regional and international levels, enhancing risk information management and supporting financial investment in priorities aimed at building resilience throughout the entire system. By prioritizing resilience, we can safeguard lives and livelihoods, enhance community stability, and drive sustainable progress, ultimately contributing to the achievement of Sustainable Development Goals (SDGs) and fostering the long-term well-being of the country.

Tapan Mishra
UN Resident Coordinator, Mongolia

* Mongolia's National Midterm Review of the Sendai Framework for Disaster Risk Reduction report (page 9).

Photo: UNDP Mongolia / Nicola Petit

EXECUTIVE SUMMARY

Mongolia is a landlocked nation in Eastern Asia, bordered by Russia and China, with a 19th ranking in landmass at 1.5 million square kilometers. Its terrain features mountains in the north and west and the Gobi Desert to the south. With a population of 3.4 million, 69% live in urban areas, including Ulaanbaatar where 48% of the populace resides. Children under 17 make up 36%, and people with disabilities account for 3% of the population. The economy, traditionally reliant on herding and agriculture, has shifted towards an extractive industry base. Mongolia is prone to various natural hazards, with climate-related incidents rising 2.9 times from 2015 to 2021. Ranked 116th on the 2024 INFORM risk index, it faces moderate risks from nature induced disasters which have historically impacted over a million people, causing public health, economic, environment, and livelihood challenges.

Mongolia's climate has significantly warmed over the last 80 years, surpassing the global average with a rise in surface temperatures by 2.25°C. This warming has resulted in 15 fewer cold days and 24 more hot days annually over the past 45 years, with mountain areas warming more than the steppes and the Gobi regions. The past two decades have seen the warmest years on record, increases in both maximum and minimum temperatures, and longer warm spells. Water bodies have notably declined between 2000 and 2015, with a reduction in lakes, rivers, and springs, exacerbating hydrological imbalances. This has led to vegetation depletion, natural zone shifts, and an expansion of dry areas, negatively affecting biodiversity and increasing extinction risks for many species. Additionally, pest and disease outbreaks are harming forests and pastures.

Droughts pose significant economic threats, especially to agriculture and livestock, and impede poverty alleviation efforts. Harsh winters, or dzuds, further challenge agricultural productivity and economic stability, driving urban migration. Future climate projections indicate a significant increase in winter precipitation, with temperature rises most notable in the western and eastern regions during winter and in the western part during summer.

In response to the challenges posed by climate change, the Government of Mongolia is enhancing its disaster risk reduction and climate change adaptation strategies. This effort is supported by the CADRI Partnership, activated at the request of the National Emergency Management Agency (NEMA) and the UN Resident Coordinator, to conduct a capacity diagnosis aimed at identifying strengths and areas of improvement in Mongolia's ability to manage climate and disaster risks. The diagnosis seeks to offer actionable recommendations to improve early warning systems, disaster preparedness, and risk reduction across critical socio-economic sectors.

From June 5-29, 2023, a CADRI team, alongside NEMA, conducted a hybrid scoping mission to determine the support scope, methodology, and timeline tailored to Mongolia's specific socio-economic and risk governance contexts. This mission involved consultations with various stakeholders, including government ministries, the UN Country Team, humanitarian and development partners, and the private sector, to outline the capacity diagnosis's scope.

The capacity diagnosis focused on three thematic areas: preparedness, early warning, and risk reduction. It examined five capacity dimensions: governance (policies, institutions, coordination, accountability), operational readiness (skills, methodologies, competencies), financing (public/private funding, ODA, vertical funds), risk information/knowledge (availability/accessibility of risk information, information management systems, early warning systems),

and access to equipment and technology. This comprehensive approach aims to inform future policy and programme interventions, strengthen national and international cooperation, support legal and operational framework revisions, and enhance disaster risk reduction and management investment.

Section III - Main findings and recommendations

Mongolia's disaster risk management system is supported by a strong legal and institutional framework that facilitates investment in disaster risk reduction and preparedness for response. The National Emergency Management Agency (NEMA) plays a central role in coordinating disaster prevention activities. Mongolia's approach to managing disaster risk is built on two main structures: the National Disaster Risk Reduction Council and the State Emergency Commission. These entities function as collaborative platforms, bringing together various stakeholders to improve coordination across sectors and provide policy recommendations for proactive disaster risk reduction. Furthermore, Mongolia's national policy framework for disaster protection aligns with key global strategies for reducing disaster risk.

In recent years, Mongolia has seen commendable progress in disaster management, thanks to the efforts of both central and local governments. Despite these achievements, there are still notable challenges, especially in the clear definition and implementation of responsibilities related to disaster risk reduction and response. Among these challenges are deficiencies in early warning systems and a lack of comprehensive integration of climate-related disaster management efforts across various government agencies. There's also a recognized need for improved coordination of preparedness activities across all sectors and for bolstering initiatives at the local level to ensure a more robust and effective disaster management system.

The report highlights several key recommendations to strengthen Mongolia's disaster risk management. Among these is the importance of fully integrating post-disaster recovery and reconstruction processes. Currently, NEMA's operational functions limit its ability to oversee these critical activities, reflecting broader issues with the policy framework and operational preparedness for recovery efforts. Addressing these recommendations can significantly improve Mongolia's resilience to disasters.

Photo: IFRC / Mirva Helenius

1. INTRODUCTION

1.1 Context and rationale of the capacity diagnosis

Recognizing that climate change is altering the face of disaster risk and increasing societal vulnerabilities, the Government of Mongolia is taking steps to strengthen its policy and governance mechanisms and initiated a process of developing an integrated disaster risk reduction and climate change adaptation strategy.

The CADRI Partnership was mobilized in response to a request from the National Emergency Management Agency (NEMA), the UN Resident Coordinator supported a diagnosis of national and local capacities to manage and reduce disaster and climate risks.

The objective of the CADRI capacity diagnosis was to facilitate and consolidate analyses of strengths and gaps of Mongolia's national and local systems to manage climate and disaster risk and provide actionable recommendations to strengthen capacities for early warning, disaster preparedness and risk reduction across high-impact socio-economic sectors. The capacity diagnosis designed in a way to inform future policy and programme interventions by the government and non-government partners in Mongolia, strengthen the cooperation on the national, regional and international levels; and support the revision and operationalization of the legal framework, standards for risk information management, and enhance financial investment for priorities in overall disaster risk reduction and management.

From 5-29 June 2023, the CADRI team, including UNRCO Mongolia, CADRI Secretariat, and UNDRR Asia-Pacific Office, led by NEMA, conducted a hybrid scoping mission in Mongolia. The aim was to establish the scope, focus, method, and timeline for CADRI's support to the Mongolian government, aligning it with the country's socio-economic and risk governance context. The team held consultations with key government and non-government entities, as suggested by NEMA, to set expectations and demonstrate CADRI's capacity diagnosis benefits.

Consulted stakeholders included various government ministries, the UN Country Team, humanitarian and development partners, INGOs, financing partners, and the private sector. The findings from these consultations resulting in formulation of the scope of the capacity diagnosis.

Three thematic focus areas — **preparedness, early warning, and risk reduction** — were examined considering five capacity dimensions: **governance** (including policies, institutions, coordination, and accountability), **operational readiness** (encompassing skills, methodologies, and competencies), **financing** (covering public and private sector funding, ODA, and vertical funds), **risk information/knowledge** (focusing on the availability and accessibility of risk information across sectors and for different population groups, notably women, as well as information management systems and early warning systems), **and access to equipment and technology.**

The government, UNCT, civil society, and other partners consulted during the scoping mission identified following priority sectors for the diagnosis of national and local capacities to manage climate and disaster risks:

1. Agriculture & Environment with the focus on livestock, crop farming and land degradation
2. Infrastructure & WASH
3. Education
4. Health
5. Social Protection & Human Mobility

Rationale for a renewed approach to capacity development for DRR and CCA

The establishment of the National Emergency Management Agency (NEMA) in Mongolia in 2003 was a significant step towards enhancing the country's disaster risk reduction (DRR) capabilities. This agency was formed by merging three existing entities: the Civil Defense Organization, the Fire Fighting Department, and the State Reserve Department. The following year, in 2004, the United Nations Disaster Assessment and Coordination (UNDAC) conducted an institutional capacity assessment, which played a crucial role in guiding NEMA and Mongolia's overall strategy for disaster risk reduction.

Many great changes in the Emergency Management sector are based on the Law on Disaster Protection of Mongolia, which was most recently reformulated in 2017. This law provides a well-structured risk governance framework, extending from the central government down to local levels. This framework is instrumental in promoting DRR in alignment with several key strategic documents. These include the Mid-term strategy of the Sendai Framework for Disaster Risk Reduction (SFDRR), the National Action Programme on Climate Change, and "Vision 2050", which is Mongolia's long-term development policy.

The organizational structure for DRR in Mongolia includes the establishment of National Council for DRR, focusing on long-term disaster risk reduction, and the State Emergency Commission, tasked with responding to sudden onset disasters. These bodies are set up at various administrative levels - national, aimag (or the capital city), and district levels. Their role is to facilitate investments in DRR and ensure rapid and effective emergency responses.

Over the years, Mongolia has made significant progress in several areas related to disaster risk management and reduction. This includes advancements in regulation, standardization, and institutionalization across different government levels. Notable improvements have been seen in risk assessment, accounting for disaster losses and damages, public financial allocation for DRR, promoting risk financing, enhancing response capacity incrementally, and integrating DRR into sector-specific areas such as education and housing.

The Government of Mongolia's Mid-term Review Voluntary Report for Sendai Framework for Disaster Risk Reduction already highlights existing capacities and gaps. Similarly, multiple assessments and existing projects across the identified sectors have already pointed to the remaining gaps to be highlighted in the five dimensions of capacities mentioned above. The CADRI Partnership capacity diagnosis built on those existing knowledge, not to duplicate the gaps that are already being addressed through ongoing or already planned initiatives.

One of the primary issues is the difficulty in translating analyzed and perceived risks into concrete mitigation and reduction measures at the local level. Localities continue to experience the adverse effects of climate-induced disasters, which not only have direct impacts but also create ripple effects across various social and productive sectors. These effects contribute to migration and urbanization, and bring about other disaster risks specific to urban areas, such as earthquakes and urban fires. The ongoing challenge for Mongolia is to address these risks effectively, ensuring that the strategies and measures implemented are responsive to the evolving nature of disaster risks in the country.

1.2 Climate and disaster risk profile

Based on the data from NEMA, the figure below depicts the occurrence of hazardous events spanning from 2001 to 2022.

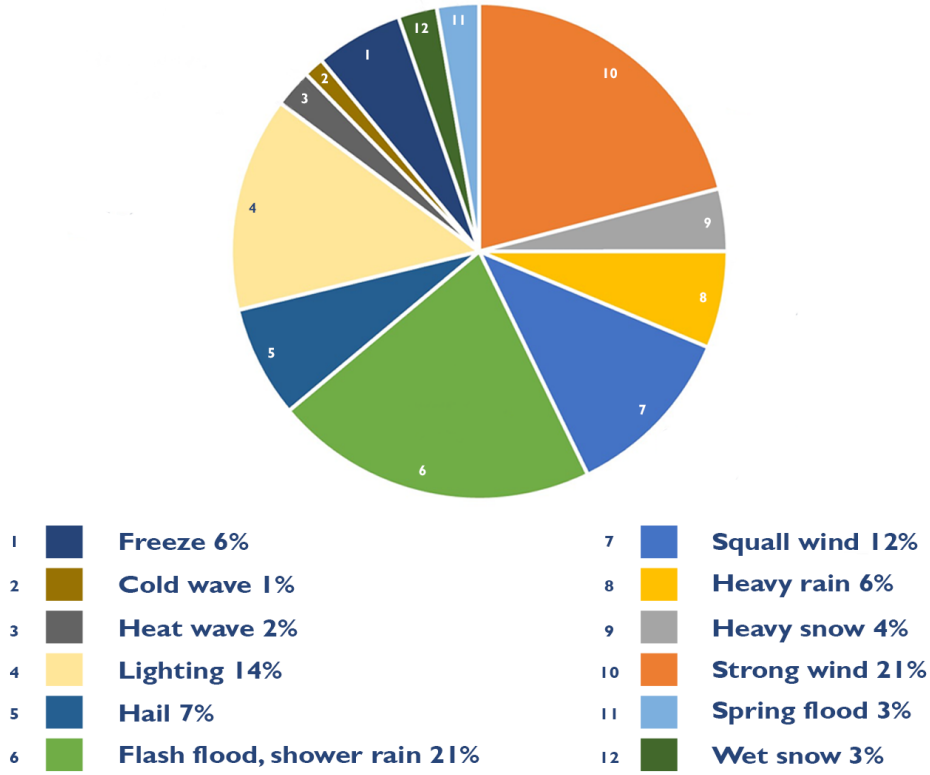

Figure 1. Hazardous events occurred in 2001-2022, NEMA

The climate in Mongolia has undergone significant changes due to warming, which is more pronounced than the global average. Over the last 80 years, surface temperatures have risen by 2.4°C, a substantial increase based on the data from 48 meteorological stations. This warming trend has led to a decrease in cold days by an average of 15 days and an increase in hot days by 24 days over the past 45 years. Mountainous areas are experiencing more warming compared to the steppe and Gobi regions. Since 2000, the warmest ten years have been recorded in the past 76 years, with monthly maximum daily temperatures increasing by 2.6°C and minimum temperatures by 0.3°C. The duration of warm spells has also increased by 13 days.

Additionally, between 2000 and 2015, there was a notable reduction in water bodies, with 21% of lakes and ponds, 12% of rivers, and 15% of springs drying out. Changes in precipitation patterns, particularly during the warm season, are causing a hydrological imbalance. This is leading to the depletion and degradation of vegetation cover, shifts in natural zones, and expansion of dry regions northward and onto mountain slopes. The habitats for biodiversity are deteriorating, posing a high risk of extinction for many species. Up to 30% of the world's biological diversity and species have already gone extinct, and this could reach 50% by 2050 without intervention. Pest species and diseases are negatively impacting forests and pasturelands, reducing growth, yield, and production.

Droughts are another recurrent natural hazard in Mongolia, causing detrimental effects on the economy, particularly in agriculture and livestock sectors. These droughts also hinder efforts to alleviate poverty. Additionally, Mongolia is often hit by dzuds, which are extremely harsh winters. These dzuds severely impact agricultural and livestock productivity, obstruct poverty reduction initiatives, shock the economy, and contribute to increased urban migration.

Looking ahead, winter precipitation in Mongolia is expected to increase significantly, while summer precipitation will remain largely unchanged. The greatest temperature increases are projected for the western and eastern parts of the country in winter and the western part in summer. Winter precipitation will significantly increase in the central, western, and eastern parts, and also in the western part during the summer.

By 2030, projections indicate that only 0.6% of Mongolia's territory will remain very dry or unchanged. Dry zones are expected to increase by 3.7% to 43.4%, and sub-dry zones by 5.9% to 45.5%. In contrast, sub-humid and humid zones are projected to decrease by 6.3% and 3.2%, respectively.

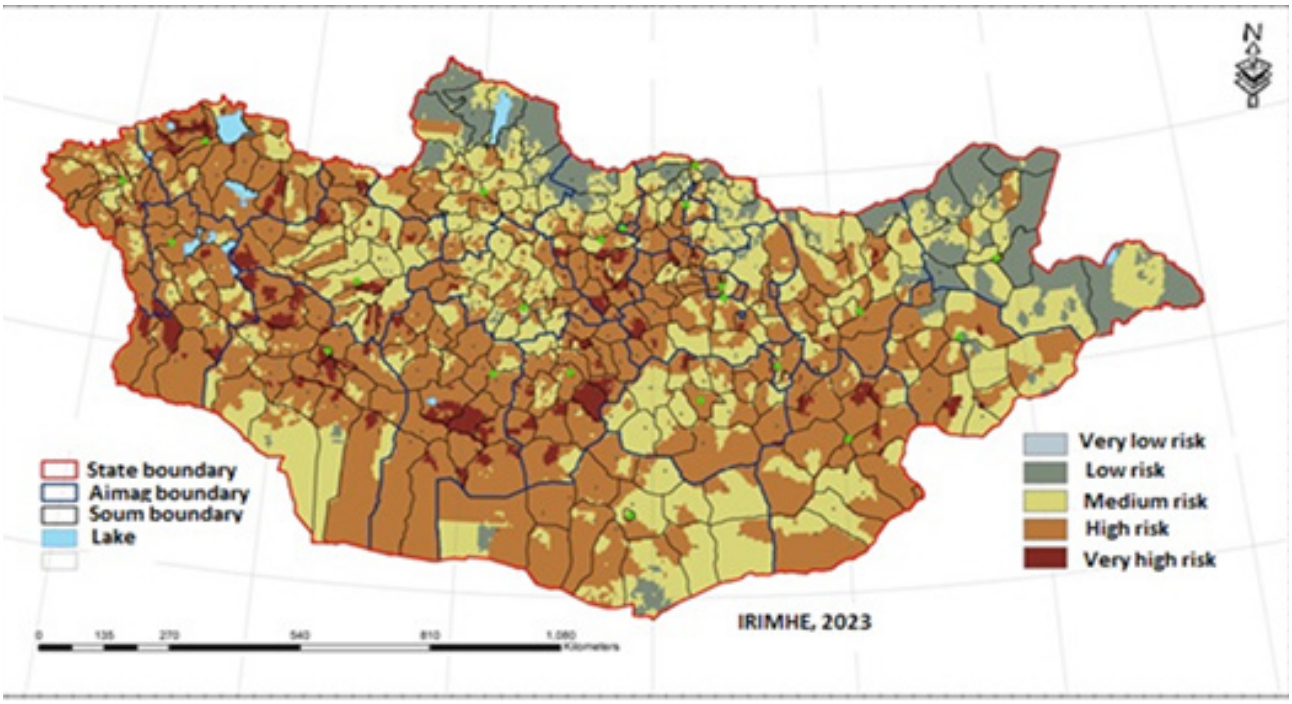

Figure 2. Aridity Index and its distribution, by 2030

Projected changes to Mongolia's aridity index by 2050 indicate a significant shift in the country's climate. A small fraction, only 0.6% of the territory, is expected to remain very dry or undergo no change. The dry zones are set to undergo a noticeable expansion, increasing to cover 45.7% of the country, which marks a 6.0% rise from the current state. Meanwhile, the sub-dry zones are likely to maintain their current extent, occupying approximately 39.6% of Mongolia. However, there will be a noticeable reduction in more humid areas; the sub-humid zones are anticipated to decrease by 6.5%, and the humid zones are also expected to diminish, albeit slightly, by 0.6%. These trends suggest a move towards greater overall aridity across Mongolia by the year 2050.

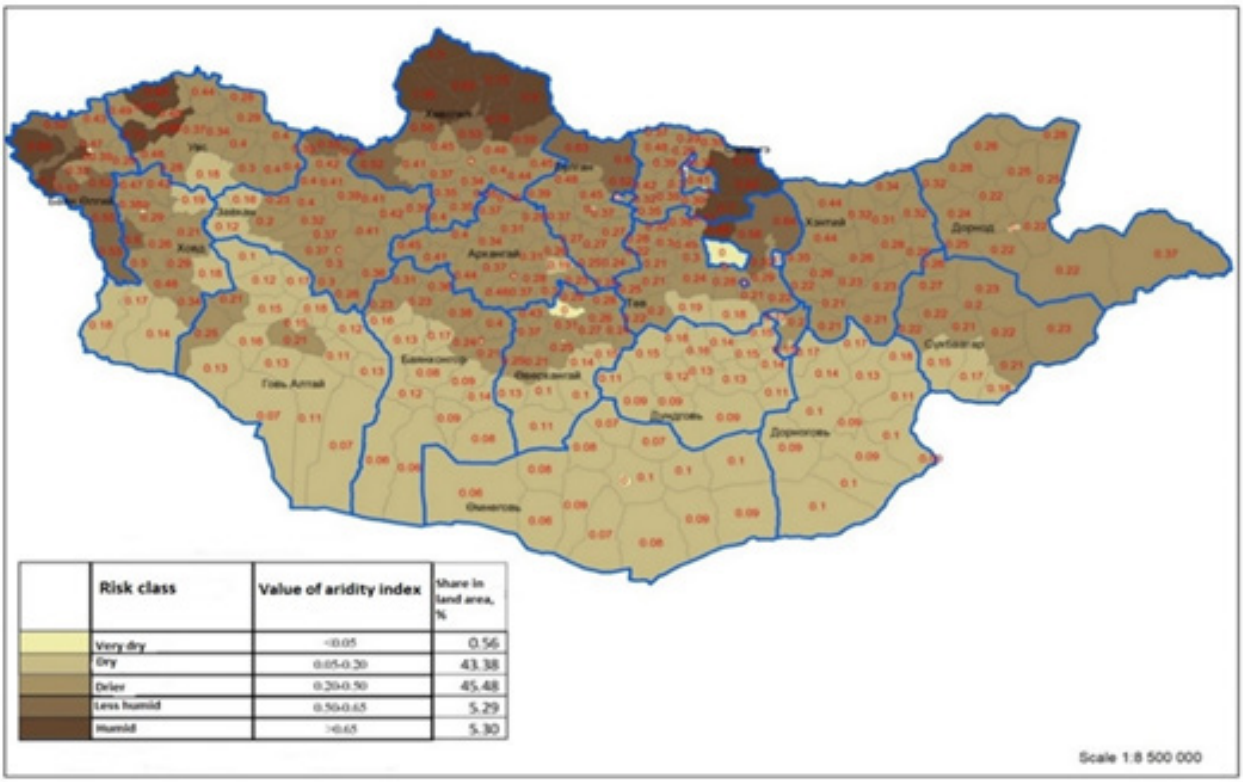

Figure 3. Aridity index and its distribution, 2050

1.2.1 Hazard profile

Hazard	Cascading Risks	Climate Change
Drought and Dzud	• Epidemic • Soil degradation • Biodiversity loss	Increase
Heatwaves	• Health risks	Notable increase
Flood	• Epidemic • Degradation of pastureland • Infrastructure failure • Health risks • Social risks	Increase (river valleys flooded by infrequent seasonal rainfall)
Earthquakes	• Social risks • Health risks • Infrastructure failure	

Hazard	Cascading Risks	Climate Change
Soil degradation	• Flooding • Vegetation loss • Crop & livestock insecurity	Indirect increase
Fires	• Biodiversity loss • Infrastructure failure	Increase
Epidemics/pandemics of infectious diseases	• Infrastructure failure • Violence	Increase

1.2.2 Population vulnerability

Climate of Mongolia is becoming warmer due to climate change, and the economic impact of climate-related hazards is high on the population who are engaged in herding and agriculture. With increasing urbanization with limited risk-informed planning, the population and physical assets (i.e., critical infrastructure, buildings and houses) are increasingly exposed to geohazards such as earthquakes, putting those who are poor and vulnerable even more at risk.

Many households that herd livestock use migration approach to avoid the severe weather conditions during winter. However, such factors as such as disability and age are limiting the mobility. These challenges can hinder the ability of families to move their livestock effectively. In the absence of adequate support or assistance, these families often find themselves unable to relocate, leaving them and their livestock vulnerable to the harsh weather conditions[1]. There is a growing agreement that climate change will intensify existing and future disparities by having a more significant impact on the world's most vulnerable communities.

In recent years, there has been a slight decline in the percentage of the population living below the national poverty line, dropping from 29.6% in 2016 to 28.4% in 2018. The reduction in poverty levels was more significant in rural areas compared to urban areas, where poverty rates remained constant between 2016 and 2018. Although poverty rates are still higher in rural areas (30.8%) than in urban areas (27.2%) as of 2018, the disparity between the two is gradually decreasing[2].

The number of affected people from disasters, excluding COVID for the last seven years in presented on the figure below.

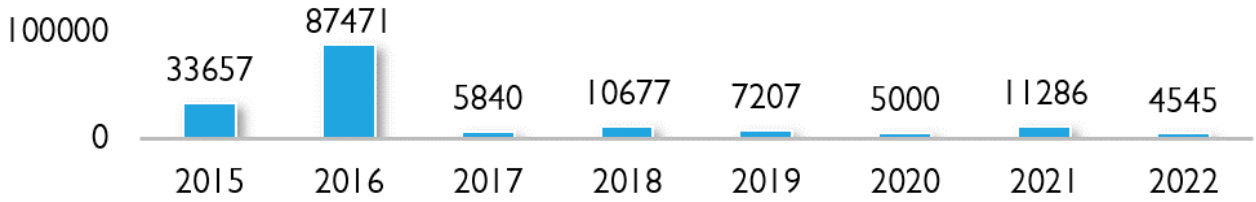

Figure 4: The number of affected people (2015-2022), reported by NEMA.

According to the detailed study conducted by the Mongolian Red Cross Society (MRCS) and IFRC[3] reveals that the continuing changes in climate are expected to have notably severe effects on specific groups, including poor families, households led by women, the elderly, and children. These segments of the population are especially susceptible to the consequences of climate-related hazards and disasters. Their vulnerability is heightened due to restricted access to information, services, and financial resources, coupled with existing health risks.

Children and young people are negatively affected by the climate-related disasters. One of the most immediate consequences of dzuds is the challenge it poses for children's school attendance. The heavy snowfall and extremely low temperatures, which can reach -40°C, significantly hinder both children and school staff from reaching educational facilities. Consequently, older children often remain with their families to assist with household tasks instead of attending school in the centres. Floods can significantly restrict children's ability to travel between their homes and schools. This is particularly challenging when they need to return home to assist their families or when trying to get back to school after a family visit. If a flood occurs at the start of the academic year and damages roads and bridges, especially in remote areas connected to provincial and district centers, it severely disrupts access to schools, impeding the continuity of education for many children.[4]

Like many other countries around the world, the recent COVID-19 crisis brought an increased awareness of the population's exposure to biological hazards and its simultaneous interaction with other hazard events, creating a complex risk landscape in the country.

The vulnerability of these groups is exacerbated by factors such as poverty, population growth, and rapid urbanization, which are further intensified by climate change. Mongolia has experienced a significant increase in annual mean air temperature and a decrease in annual precipitation, along with erratic seasonal rainfall patterns. These climatic changes compound the risks posed by natural disasters like earthquakes, floods, droughts, and dzuds, making disaster preparedness and resiliency vital.

Photo: IFRC / Mirva Helenius

2. CAPACITY DIAGNOSIS METHODOLOGY AND PROCESS

2.1 CADRI capacity diagnosis methodology

The capacity diagnosis of the Disaster and Climate Risk Management system was facilitated using the CADRI Capacity Diagnosis and Planning Tool. This methodology was developed to support the assessment of existing capacities, gaps and challenges at national and local level according to the four priority areas of the Sendai Framework for Disaster Risk Reduction (2015-2030) (see figure 5) and the five capacity dimensions of the CADRI Tool (see figure 6). The tool comprises a modular questionnaire that serves as a guiding analytical framework for the capacity diagnosis: it provides the basis for conducting a diagnosis based on semi structured interviews and secondary data analysis.

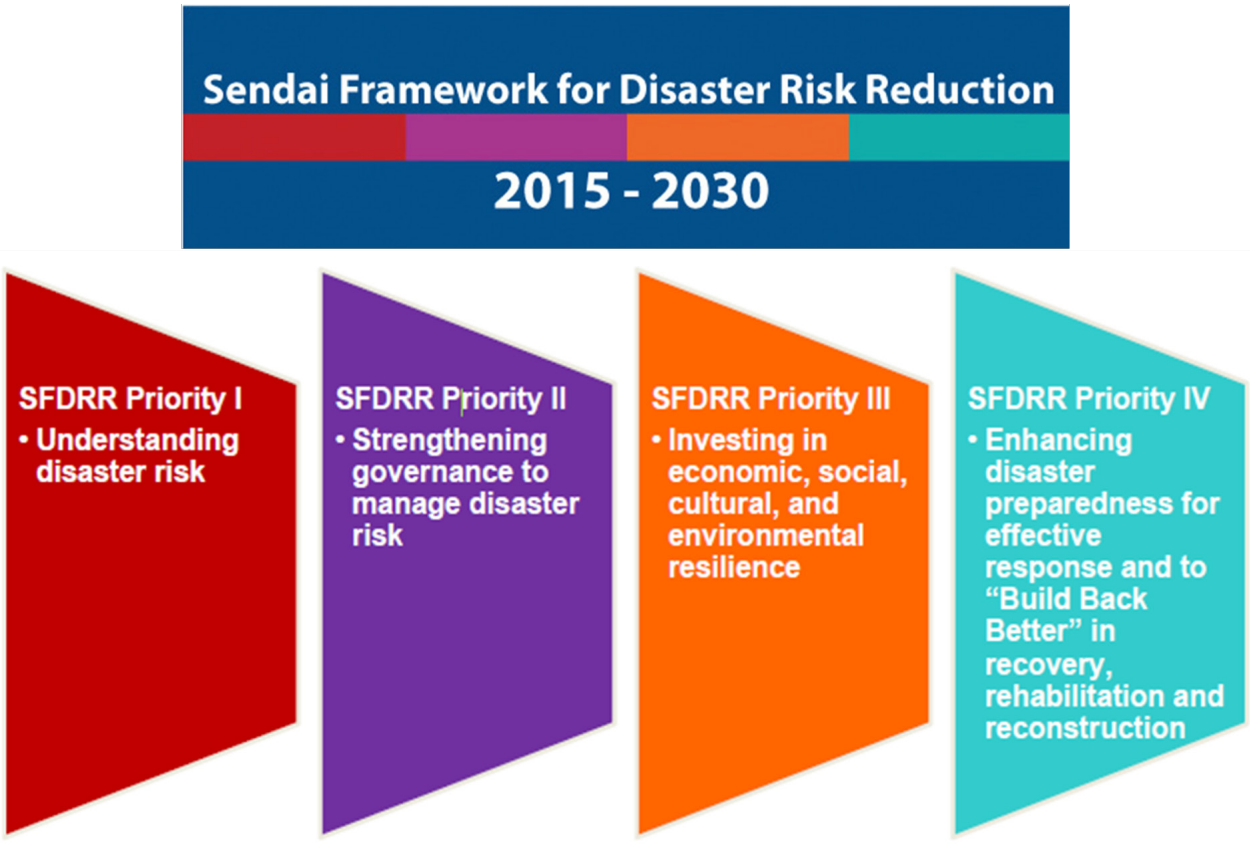

Figure 5. Sendai framework for Disaster Risk Reduction priorities

The CADRI Tool is divided into a generic questionnaire which is structured according to the four priority areas of action of the Sendai Framework and including climate services, and various sector/issue specific modules developed by the CADRI partner agencies including: Agriculture and food security; Culture; Education; Environment; Health; Human mobility; Infrastructure; Nutrition; WASH.

Figure 6. CADRI capacity diagnosis and planning modules in connection with the SDGs.

During the assessment phase, the following capacity dimensions were addressed:

Governance: This includes Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) related legislation, policies, and institutional mandates and arrangements. It also covers the roles and responsibilities within these frameworks.

Implementation capacity: This dimension encompasses technical, managerial, and soft skills and competencies. It also involves management, administrative, and planning systems, along with communication flows and systems.

Financing: This refers to financial instruments for DRR and CCA, including budgeting, risk transfer, and private financing. It also covers public

and private sector investments in DRR and CCA technologies and services.

Knowledge: This area focuses on methodologies for data collection, analysis, sharing, and information generation and dissemination. It includes databases, information management systems, and observatories.

Technology and equipment: This dimension assesses the availability, suitability, and use of material resources, technologies, and IT equipment.

Assessment team

The capacity assessment was led by the National Emergency Management Agency (NEMA) and the UN Resident Coordinator's Office, and it was jointly carried out by a multi-disciplinary team composed of 16 selected national and international experts from NEMA, UNFPA, FAO, UNDP, IOM, UNDAC, UN Habitat, UNDRR, World Vision, WMO (China and Korea Met experts), CADRI Secretariat.

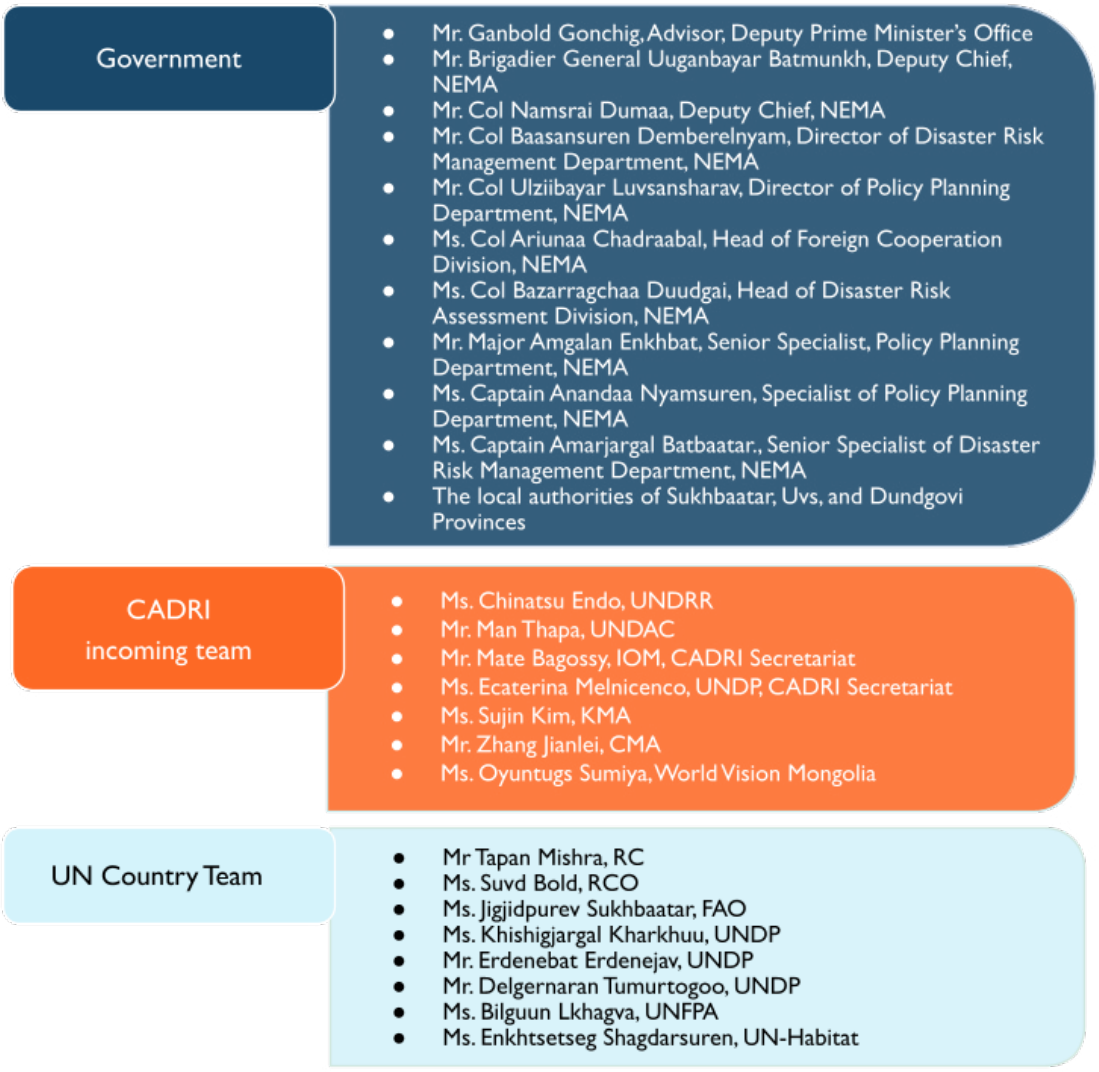

Figure 7. CADRI capacity diagnosis team composition Mongolia.

Data collection and analysis

The capacity diagnosis is derived from a self-assessment by country stakeholders of the strengths and weaknesses of the disaster and climate risk management system at national and local level across socio-economic sectors. Information collected from interviews of country stakeholders (central and local governments, non-government organizations, development and humanitarian partners, private sector, civil society) and desk review of reports is triangulated by the CADRI Partnership team.

The list of documents reviewed is included in Annex 1. Consultations with key stakeholders consisted of semi-structured interviews that were prepared with the support of the CADRI Digital Tool. The teams carried out interviews with a total of more than 100 central government representatives, 120 local level actors, 7 civil society actors, 2 private sector organizations and number of development and humanitarian partners.

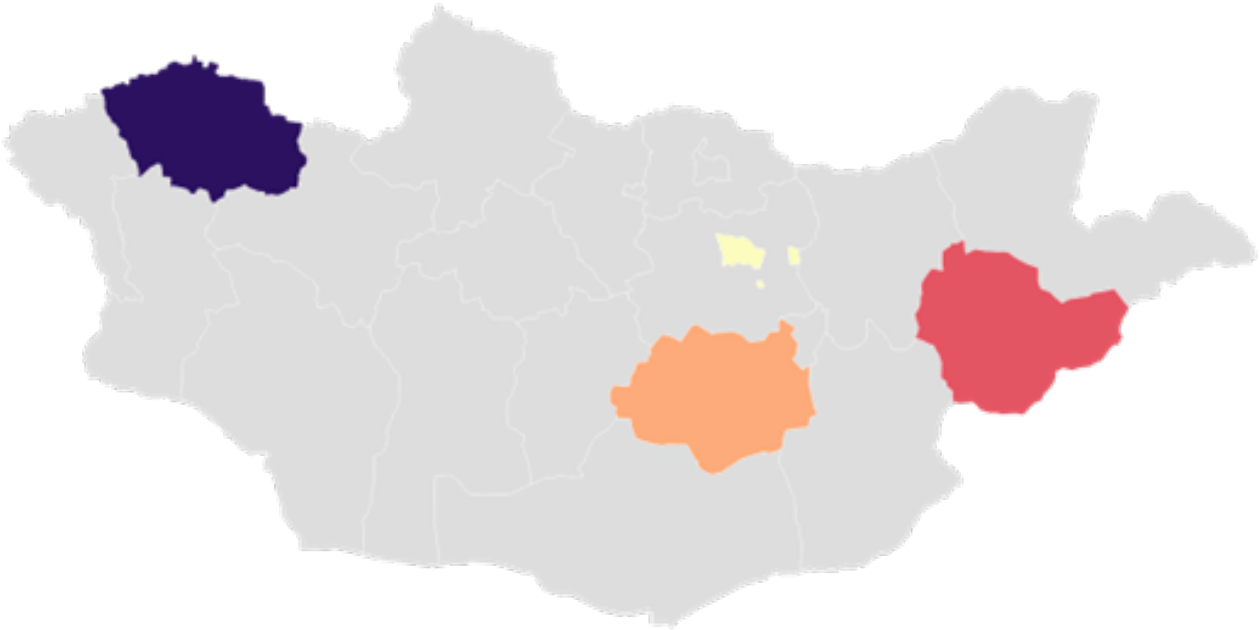

Figure 8. Regions vizited by the Assessment Team.

The recommendations are organized by sector, focusing on specific capacity dimensions: governance, implementation, financing, knowledge, and technology and equipment. To streamline the content and avoid repetition, the knowledge capacity dimension was combined with technology and equipment where feasible. This approach ensures the recommendations are both comprehensive and meaningful.

The proposed recommendations are categorized based on three key criteria based on the expert knowledge and a validation exercise with the key stakeholders:

- **Urgency**: ranging from 'Urgent' to 'Not Urgent.'
- **Implementation complexity**: Spanning from 'Easy to Implement' to 'Complex.'
- **Budget (cost) consideration**: From 'Low Budget' to 'High Budget.'

2.2 Limitations

- The assessment does not thoroughly explore key legal and policy documents that are currently under development, such as the Climate Law and Disaster Risk Insurance Law.
- The study predominantly focuses on infrastructure related to flooding, schools, health facilities, and energy. This limited focus is attributed to the assessment team's restricted expertise in these specific areas. Consequently, other vital infrastructure sub-sectors might be overlooked, affecting the comprehensiveness of the assessment.
- The team conducting the assessment lacked expertise in specialized areas like education, WASH (Water, Sanitation, and Hygiene), and health. This limitation led to an integration of data from the health and education sectors across the other sectors where relevant, reducing the overall comprehensiveness of the sector analysis.
- There was minimal engagement with the private sector, with only two consultations conducted. According to the assessment methodology the focus of assessment was for the public sector.
- Air quality issues, critical for the country and especially for the capital city, are not included in the assessment. This is due to the categorization of air quality under environmental management rather than disaster risk management. This exclusion leads to a gap in addressing a significant risk factor that impacts public health and safety.

Photo: UNDP/Mongolia

3. FINDINGS AND RECOMMENDATIONS - CROSS-SECTOR

The findings and recommendations in this report are the outcome of consultations with country stakeholders, including central and local governments, civil society, humanitarian and development partners, and triangulation of secondary data analysis. The recommendations are based on suggestions collected from the consulted national and local stakeholders.

3.1 Overview

This chapter presents the analyses of the system that is currently in place in Mongolia to facilitate disaster risk reduction and management, including early warning and preparedness for response and recovery. The chapter focuses on the elements that have broader implications for multiple sectors and it is structured around the key capacity aspects of governance, knowledge & technology, financing, and implementation. Each one of these capacity aspects are presented with the analyses for three thematic areas:

i) long-term disaster risk reduction (DRR),
ii) early warning, and
iii) preparedness for response and recovery.

The chapter looks at long-term DRR as the capacities to reduce and mitigate known disaster risk before the occurrence of disasters, and to adapt to the effects of changing climate. Early warning is looked at as a function of disaster risk management in preparedness that facilitates early actions. Preparedness focuses on the knowledge and capacities of the government to effectively anticipate and respond to mitigate the impact of disaster events, and to recover from them.

3.2 Governance

3.2.1 Strengths

Current legal, institutional framework provides an enabling environment for ex-ante disaster risk reduction investment, and preparedness for response. The National Emergency Management Agency (NEMA) is given authority to lead disaster risk reduction and management related activities. Existing institutional frameworks which evolved over the past two decades devise a multi-sectoral and multi-stakeholder structure necessary for effective disaster risk reduction, response, and recovery operation. The development of a legal framework for climate and adaptation plans indicates the government's increasing attention and focus on climate change-induced disasters.

Regulatory framework

Mongolia has the Law on Disaster Protection and the Law on Fire Safety that institute an overall governance mechanism to promote disaster risk reduction in the country. In addition, the Law on State Reserve enables swift mobilization of emergency stockpiles and boosts overall disaster response capacity. While disaster risk reduction is primarily defined in the three laws mentioned above, the Environmental Protection Law and the Law on Water, Climate and Environmental Monitoring complement the existing regulatory framework by providing to address environment/ climate-related or climate change-induced disasters, while devising the Government Resolution 286 on Early Warning, 2015. The Government is currently developing the Law on Climate. The regulatory environment for risk transfer is evolving and the Law on Disaster Risk Insurance is currently drafted. Below are the descriptions of major cross-sectoral regulatory frameworks, including one for the early warning systems.

- **The Law on Disaster Protection 2017** governs the country's disaster risk reduction and management. The first Law on Disaster Protection was enacted in 2003, following which NEMA was established. In 2017, the law was reformulated to strengthen a number of aspects including disaster risk reduction and prevention, humanitarian coordination, and recovery. The Law broadly

defines the definitions and requirements for disaster activities, including pre-disaster during disaster and post-disaster. The pre-disaster activities includes disaster risk assessment; preparedness and risk-informed planning; disaster protection training; and risk information data management. Many improvements made in 2017 is the establishment of a multi-stakeholder institutional framework for disaster risk reduction (National DRR Council) and response (State Emergency Commission) at the national and local levels.

- **The Law on Fire Safety 2015** regulates the process and responsibilities/mandates of the national and local authorities in their firefighting operations. The law was originally enacted in 1999 and amended in 2015.
- **The Law on State Reserve 2007** regulates the procedures for stockpiling and distributing emergency supplies and goods during emergency situations such as disasters, economic and other crises such as war.
- **The Environmental Protection Law 1995** regulates the management of natural resources such as land and soil, underground resources and mineral wealth, water, plants, animals, and air. It mandates the governments and business entities to undertake environmental resources monitoring and impact assessments.
- **The Law on Water, Climate and Environmental Monitoring 1997** regulates the process for monitoring the quality and availability of water and environmental resources, and climate resources which is defined by the physical elements such as solar radiation, precipitation, air, soil moisture, solar/hydro/thermo-energy.
- **The Government Resolution on Early Warning - Resolution 286 (2015)** is anchored to the Law on Disaster Protection and the Law on Water, Climate, and Environmental Monitoring, and specifies the procedures for early warning concerning water, weather, environmental, geological hazards. The Resolution defines the types of hazardous weather events, the basic frequency of forecasting/warning, and the basic means of communication utilized to disseminate the information.

Other Laws under development

- (draft) **The Law on Climate**

- (draft) **Law on Disaster Risk Insurance** is currently formulated to regulate broader disaster risk insurance products and the current draft is the fifth version following succession of multiple revisions over the past several years. NEMA plans to submit the draft law in Spring 2024 for an approval. Current version of the law does not include risk insurance for public assets.

Disaster risk reduction and climate change adaptation are practised across multiple sectors and each sector has a set of laws and regulations that enable specific actions. Those are outlined in the respective chapters for Productive and Social Sectors.

Institutional framework

National Emergency Management Agency (NEMA) was established in 2004 and it leads the implementation of laws, regulations, and state policies on disaster protection, in coordination with and by guiding different segments of the government administrations at the national and local levels. Under the leadership of the Deputy Prime Minister, NEMA coordinates an overall institutional framework for disaster prevention. The two pillars of Mongolia's disaster risk management/reduction institutional framework are (1) National Disaster Risk Reduction Council and (2) State Emergency Commission that serves as multi-stakeholder bodies to enhance coordination and collaborations across the sectors to provide policy recommendations for

ex-ante disaster risk reduction (National DRR council) and make decisions for disaster response (state emergency commission).

- **National DRR Council:** At the national level, the National Council for Disaster Risk Reduction (NCDRR) consists of 29 members from the government, civil society, academia, media, and the private sector. Under the chairmanship of the Deputy Prime Minister, NCDRR generally meets once a year. At the local level, there are 31 Local Councils for Disaster Risk Reduction (LCDRR), one in each of the 21 provinces, 9 districts, and Ulaanbaatar city. LCDRR is chaired by the chairman of the local parliament (Citizens' Representative Khural).
- **State Emergency Commission:** At the national level, the State Emergency Commission (SEC) is led by the Deputy Prime Minister and the members gather at the time of disasters and national emergencies to coordinate, make decisions, and a execute rapid response, and monitor disaster management and response operations. Under SEC, the Local Emergency Commission LEC) operates in every province, districts, soums, and Ulaanbaatar city under the leadership of the Governor. SEC establishes the Emergency Operation Staff (EOS) after major disasters to undertake response operation. NEMA (national level) and Local Emergency Management Authority (LEMA) carries out the response operation.

As per the Law on Disaster Protection, prevention, response and immediate recovery operations are carried out under the leadership of NEMA in coordination with the national and local (Aimgag, capital city, soum/district) emergency management division.

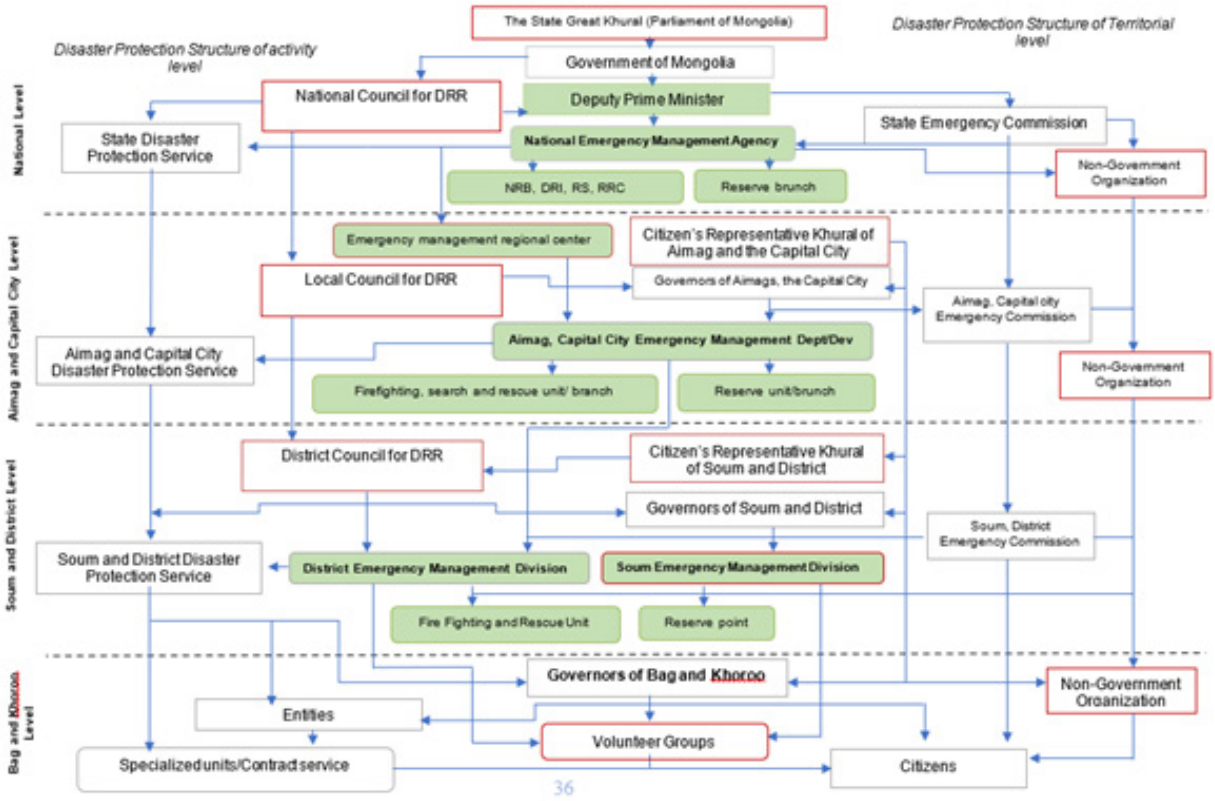

Figure 9. Disaster protection institutional framework

While there is no individual-policy document articulating the institutional framework for early warning systems but in practice, National Agency for Meteorology and Environmental Monitoring (NAMEM), the Institute of Astronomy and Geophysics of Mongolian Academy of Sciences (IAG), and NEMA play the primary role for monitoring, observation, and forecasting/early detection of hazardous events (NAMEM and IAG) and warning dissemination (NEMA and NAMEM).

NEMA's organigram is constructed around its key roles: planning, implementation, monitoring, and support.

Figure 10. NEMA organigram / organizational chart

Planning

- **Policy and Planning Department** is in charge of formulating policies, strategies, and plans. It is also responsible for coordinating and building partnerships with all related stakeholders.

Implementation

- **Risk Management Department** provides technical guidance, planning, and management of risk assessment. It also provides the policy on scientific research and innovation on disaster prevention, and promotion of science-based disaster prevention activities.
- **Prevention Department** is responsible for planning, implementing, and coordinating disaster prevention activities and training, including public awareness campaigns.
- **Emergency Operation Department** is responsible for planning and organizing preparedness for equipment and personnel

required for early warnings and emergency operations. The department is also responsible for organising, managing, and providing reliable and continuous management of early warning systems at the national level.
- **Firefighting Department** manages the fire control operation including management of fire fighting equipment and tools. The department also develops norms and regulations for fire control.
- **State Resources Department** manages and coordinates the emergency goods and resources, and this includes warehouse management.

Monitoring

- **Monitoring and Inspection Department** monitors and assesses the implementation of disaster protection policies and programs, conducting internal audits of financial operations. Responsible for preparing quarterly and annual reports.

Support

- **Finance and Logistics Department** is responsible for planning and execution of budget, financial, and investment policies. The department is also responsible for planning of logistics and supply operations, updating equipment and technologies, ensuring readiness, developing standards, norms, increasing resources, and strengthening capacity
- **Administrative Management Department** is responsible for development and implementation of organizational administration and management leadership, implementation of laws and decisions, human resource registration, staff survey and development, social issues and integrated policies. manage and organize personnel, internal service and staff training, and ensure internal workload management.

Policy framework

Mongolia's disaster protection national policy farmwork has been always alighted to the major global strategies for disaster risk reduction. During the period of Yokohama Strategy for a Safer World 1994-2005 and Hyogo Framework for Action 2005-2015, Mongolia ran the National Natural Hazard Mitigation Program. In 2011, the State Policy and Programme on Disaster Protection was formulated, and this continued up to 2020. The mid-term strategy for implementing Sendai Framework for Disaster Risk reduction in Mongolia (phase I: 2017-2020, phase II: 2021-2025, and phase III: 2026-2030) gives the overall strategic guidance and priorities to advance disaster risk reduction in the country in pursuit of Mongolia's Vision 2050, a long-term development vision. To implement the policy framework, the National Programme of Community Participatory Disaster Risk Reduction is rolled out over the two phases (2015-2020 and 2021-2025). The National Adaptation Plan of Mongolia is in the process of drafting at the time of the writing of this report. Below is the list of key cross-sectoral policy documents that are effective today and support the implementation of disaster risk reduction and climate change adaptation. Note that the relevant sectoral policies and strategies are discussed separately in the Productive Sector and Social Sector chapters.

- National Security Concept of Mongolia
- The Basis of the Defense Policy of Mongolia
- National Framework in Strengthening Disaster Protection Capacity
- National Programme on Community Participatory Disaster Risk Reduction

- National Plan for Prevention and Rescue of Population, Animals and Properties from Disaster, Disaster Response and Early Warning
- The mid-term Strategy for implementing Sendai Framework for Disaster Risk Reduction in Mongolia
- National Adaptation Plan (under development)

3.2.2 Gaps and challenges

The institutional mechanism for disaster risk reduction and response is well defined by the laws but at the level of implementation, there is a certain level of confusion or lack of clarity on the responsibilities. This seems to be the case particularly in the process of the transition from emergency response operation to early recovery and recovery/reconstruction phase. The Law on Disaster Protection 4.1.16. defines "immediate recovery operation" as actions rebuilding and restoring in order to normalize post disaster situations. However, it is not clear in the existing framework what actions are involved when and by who in what socio-economic sectors. There is no existing policy on post-disaster recovery and reconstruction. Similarly, ministries and local governments are less clear about what measures should be prioritized in respective development sectors to reduce future disaster risk, and to better adapt to the effects of climate change.

Current regulatory framework has a limited scope of the protection of specific vulnerable groups who often bear more cost than the others in society. Elderly people, persons with disability, women, and children have specific vulnerabilities in relation with the effects of disaster events such as physical ability, accessibility to basic services, and potential gender-based violence to name a few. The Law on Disaster Protection attempts to protect people with disability and (pregnant) women by excusing them from the duties of disaster protection human resources. However, the existing provision does not necessarily ensure that a particularly vulnerable population is provided with necessary care during disaster response, recovery and reconstruction phase, or to reduce their specific vulnerabilities to disaster as part of the pre-disaster risk mitigation solutions.

The laws and regulations of Mongolia cover the broader spectrum of DRR, but it has limited scope on the early warning system, primarily focusing on dissemination and communication of warning. As a result, early warning is mainly considered the role of the National Agency for Meteorology and Environmental Monitoring (NAMEM), the Institute of Astronomy and Geophysics of Mongolian Academy of Sciences (IAG), and NEMA.

In 2004, NEMA is established by merging three government agencies namely, Civil Defence Organization, Fire Fighting Department and State Reserve Department[5]. This is reflected in today's operational set-up of NEMA/LEMA where there are separate departments for emergency operation management and fire. As a result, separate units of rescuers (firefighting unit and search & rescue unit) and Inspectors (fire safety-related inspections and other disaster safety-related inspections) are trained and maintained. Given NEMA/LEMA's finite human and financial resources and their vast geographical coverage (21 Provinces and Ulaanbaatar City), there is a potential need of optimizing available trained human resources in those areas.

Prevention

Existing functions of implementation departments under NEMA do not allow NEMA to guide the process of post-disaster recovery and reconstruction. This echoes with the weak policy framework or operational readiness for recovery and reconstruction.

Disaster and climate risk reduction and prevention are fundamentally the business of respective socio-economic sectors. However, not every ministries and local governments currently have dedicated capacity (human resources with technical knowledge, plans, and budget) to practise risk reduction and prevention.

3.2.3 Recommendations

Recommendation	Urgency	Ease of implementation	Cost
Develop a directive to clarify the operational roles and responsibilities of sector ministries and departments in different phases of disaster risk management (emergency response, recovery/ reconstruction, mitigation, and preparedness phase) and key disaster scenarios such as flood, dzud, earthquake, storm/strong wind, and fire.	Urgent	Easy to implement	Low budget
Categorically address the unique vulnerability and needs of people with disability, elderly citizens, women, and children in the disaster protection law and DRR strategy. To do so, consider the engagement of National Committee on Gender Equality (NCGE) becomes part of the overall function of DRR Council.	Urgent	Easy to implement	Low budget
Develop a policy framework and plans (short, medium, and long-terms) for improving end-to-end multi-hazard early warning systems that addresses four aspects: i) risk knowledge; ii) detection, observations, monitoring, analysis and forecasting; iii) warning dissemination and communication; and iv) preparedness to respond, and that ensures joint responses from various ministries beyond NEMA, NAMEM, and IAG.	Urgent	Complex	Low budget
Improve the linkages and synergies among the Law on Disaster Protection, the Climate Law and Environment Law to have better coherence for climate-related disasters across the government.	Not Urgent	Complex	Low budget
Put in place inter-unit configuration of human resources (e.g., firefighting unit and search & rescue unit) to build an optimal capacity within the existing pool of trained rescuers.	Urgent	Easy to implement	Low budget

Recommendation	Urgency	Ease of implementation	Cost
Define minimum functional capacities required within sector ministries and local governments to carry out disaster and climate risk reduction, and institute this function in the form of a specific unit within the ministries and local government.	Urgent	Easy to implement	Low budget
Institutionalize a mechanism of inter-department/ ministry secondment to promote transfer of technical and functional knowledge for disaster risk reduction and management across the government system.	Urgent	Easy to implement	Low budget

3.3 Knowledge and technology

The knowledge of hazard, exposed population and assets, and vulnerabilities are the foundation of effective disaster risk reduction and management. Long-term disaster risk reduction investments are made based on the potential impact of disasters understood based on the factors such as probability of the occurrence of hazardous events, historical losses and damages from disasters, and different vulnerabilities of the population and assets at risk. Precision and accuracy of the forecasts of hazardous phenomena and events determines the effectiveness of early warning systems, including prompt notifications and actions. Knowing historical impacts of disasters and today's vulnerability of the population and assets can also facilitate impact-based forecasting for different meteorological phenomena, and subsequently help act early and prioritize preparation of response operation. Importantly, generation, analysis, and dissemination of risk knowledge demands the availability and application of technologies.

Overall, Mongolia has a strong knowledge and information on hazard, exposure, and vulnerability, backed by the capacities to apply available technologies. The current level of knowledge and information on hazardous events, historical losses and damages, and the availability of exposure data are considered robust enough to inform the actions for long-term disaster risk reduction, early warnings, and prepositioning for early action. Continued improvement is desirable for better precision of risk knowledge while investing in the maintenance and the enhancement of technologies and equipment.

3.3.1 Strengths

Hazard monitoring, observation, and forecasting

Mongolia has the capabilities to undertake monitoring, observation, and assessment of meteorological hazard (Dzud, drought, severe weather/storm), geological hazard (earthquake), and hydro-meteorological hazard (flood). A mechanism of early warning has been established and continuously improved not only for meteorological hazards but also for geological hazard such as earthquake.

HYDROMETEOROLOGICAL HAZARD

Most disaster situations are directly or indirectly affected by meteorological phenomena. Therefore, accurately predicting dangerous weather, thorough preparation in advance, quick and precise detection, and prompt notification and action in dangerous situations are vital elements of an early warning system. Mongolia, where the primary industry is livestock farming, experiences contrasting extreme summer and winter climate characteristics. Thus, not only short-term weather events and forecasts but also monthly and seasonal climate forecast information are of great importance.

National Agency Meteorology and the Environmental Monitoring (NAMEM) maintains a network of 137 meteorological observation stations and 181 posts, and 152 hydrometeorological stations across the country. The first observation started in 1936 when the National Hydrometeorological Service of Mongolia was established[6]. NAMEM produces the forecasting information and the Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE) regularly updates and produce hazard extent/zoning maps for strong wind, dust/sand, Snowstorm, dzud, and flood. Flood hazard analysis is available for the return periods of 25, 50, 100, and 200 years.

NAMEM collects observation data at 5-minute intervals from over a thousand stations, and it takes about 3 minutes for data transmission and automatic quality control mechanisms, allowing the data to be checked about 8 minutes after the time of observation. NAMEM also utilizes remote sensing data from Japan's Himawari and Korea's Communication, Ocean, and Meteorological Satellite (COMS), along with the operation of two radars around the Ulaanbaatar area. The observation data is collected via internet networks or satellite communication.

Depending on the forecast period, NAMEM generates weather forecasts for very short-term (3/6/12 hours), short-term (3 days), medium-term (7 days), One month, and seasonal term (three months). It also provides information on water levels, flow rates, and the forecasts information related to agriculture and environment, including air quality, surface water quality, soil quality. NAMEM applies numerical model data from overseas sources such as the USA (National Centers for Environmental Prediction, the Weather Research and Forecasting (WRF)), EU (European Center for Medium-range Weather Forecasts, ECMWF), Japan (Japan Meteorological Agency) among others, and operates an ensemble model consisting of six members based on this data.

All weather information is disseminated through its website, TV, radio, Facebook, and other channels. In dangerous situations, NEMA or NAMEM uses electronic signs, sirens, and text messages through agreements with mobile carriers to deliver disaster and weather information. Siren towers, as well as TV and radio stations are in operation to disseminate disaster warnings.

With the increasing risk of multi-hazards, there is a growing emphasis on impact-based forecasting, which considers the impacts of weather events on each field by integrating weather data with information from other fields. Analysing data sets within each field and assessing the impact of weather events alone are challenging, and even advanced meteorological countries are progressively developing and expanding impact-based forecasting for each meteorological phenomenon.

GEOLOGICAL HAZARD

The first seismic station in Mongolia was installed in1967, and today, there are more than 100 earthquake monitoring stations in the country. The Institute of Astronomy and Geophysics (IAG) of Mongolian Academy of Sciences is the sole entity that manages the network of seismic stations across the country, monitoring and analysing seismic hazards on a day-to-day basis. Upon detection (~2 minutes), automatic notifications (~1 minute) and reanalysis notifications (~10 minutes) are provided. Monitoring is conducted 24 hours a day, including the collection of observation data from border areas such as Russia and China. Country-wide earthquake hazard maps are made available periodically and the latest one available today is from 2018. Although there have not been many cases of large earthquakes in recent years, the continuous expansion of the observation network has led to the discovery of faults around Ulaanbaatar. Since 2005, large and small earthquakes around Ulaanbaatar have become more frequent, leading to increasing interest in this area. Recently, a new 50km-long active fault Ulaanbaatar Fault (UBF) was discovered, and it is estimated to be capable of causing M7+ earthquakes[7].

A simple earthquake early warning system was developed for Ulaanbaatar area based on the three seismic stations located 170km south (Deren), 300km west (Mogod), and 285km north (Buren buteel) of the capital, giving about 46-84 seconds lead time depending on the location of seismic activities. The information on the detected seismic activities beyond certain magnitudes are automatically sent to NEMA for necessary actions.

Exposure

Exposure data and information such as population and assets at risk is managed by various ministries and departments. Mongolia has most of the exposure data made available digitally as part of the National Spatial Infrastructure. In 2022, Ministry of Construction and Urban Development, Department of Geodesy and Cartography developed an open Geo-portal (https://nsdi.gov.mn/, https://egazar.gov.mn/) as a repository of exposure data and the digitized information on natural resources and land, all geo-referenced for analysis by anyone. The data offered on the geo-portal includes buildings, settlements, land use, infrastructure, transport network, cultural and archeological assets, and demographic information. As for natural resources and land assets, geology, soil, ground cover, topography (including elevations and depth), hydrologic data are available. The data on the Geo-portal is drawn from the Department of Land Management Geodesy and Cartography's Land Unified Classification Management System and databases that integrate data from various government agencies.

Disaster-related statistics

NEMA collects real-time information on disaster incidences (including most natural and social disasters, forest fires, and other accidents, etc.) 24/7. Over the past years, the methodologies and the system to collect and store disaster-related statistics have been improved and there is an ongoing effort to integrate available risk knowledge into one platform. NEMA manages three web-based platforms. The vehicle movement system (VMS)[8] (www.vms.nema.gov.mn, closed access) is where incidences are registered through operators at NEMA central and local levels. Those incidences are further investigated, and the information on affected population, assets, direct loss and damages, and needs are populated on another platform (www.data.nema.gov.mn, closed access) according to the Procedures for Assessing Disaster Damage and Needs (Government

of Mongolia, No.1 2019). Affected people are captured by age, sex, pregnancy, disability (visual, hearing, speech, physical, intellectual), and other social status such as employment and school enrollment/dropout. Certain incidents that qualify as disaster are officially recorded as disaster losses and damages approximately 2-4 months after the occurrence of the incident. Losses and damages calculation follow the methodology presented in the Guidelines on Assessing Losses from Natural Disasters, Wind and Storm (2022, draft). Mongolia's disaster-related statistics have been available since 2000 though disaggregated data collection started only recently after updating the methodologies and procedures for data collection. Mongolia's disaster-related statistics used feed into DesInventar[9] which is a global Disaster Information Management System of disaster-related statistics administered by the United Nations Office for Disaster Risk Reduction (UNDRR). However, due to the changes in Civil Service Secrets Act and reclassification of disaster data (not every data was considered disaster-related), updating data in DesInventar was temporarily discontinued in 2016.

Risk assessment

As per the requirements by the Law on Disaster Protection, every government and private entity and administration (national to local) is required to conduct risk assessments. Provincial-level risk assessment compliance is 100% by 2020, and those assessments were undertaken as part of the preparatory phase for provincial development plan 2030. City or sector-specific risk assessments have also been done – for example, Ulaanbaatar's risk assessment for earthquake (2013) and flood (2015), and separate risk assessments were done for roads and railways. Every year, dzud risk assessments are conducted.

On earthquakes, there are at least two earthquake scenarios developed for the region around Ulaanbaatar through a project by JICA in 2013. One is Based on Hustai Fault (maximum expected magnitude Mw 7.5) and the other as an integrated scenario for Emeelt fault (maximum expected magnitude Mw 7.0) and Gunjiin Fault (maximum expected magnitude Mw 6.6). For both earthquake scenarios, MSK scale seismic intensity is calculated at VIII – IV[10]. Based on the Hustai scenario, 60% of the buildings in Ulaanbaatar are estimated to collapse. Another study recently conducted based on the Emeelt fault earthquake scenario estimates a total cost damage at USD 27billion USD (26% of GDP)[11].

Recently, NEMA and Asian Development Bank (ADB) worked on the nation-wide disaster risk assessment as part of ADB's technical assistance project and assessments were undertaken for earthquake, dust storm, windstorm, snowstorm, drought, dzud, flood, wildfire, lightening/thunderstorm, animal diseases, and house/building fires at the national and sub-national level. The risks assessments are available for specific sectors, including transport, agriculture, energy, and telecommunication[12].

Disaster and climate risk knowledge portals

There have been some efforts to consolidate available risk knowledge and make it accessible publicly. NEMA is currently developing a disaster risk database (www.risk.nema.gov) where existing disaster risk assessments and disaster-related statistics are made accessible together with exposure data (population and assets). Also, Water, Climate, Environmental Research and Information Institute has the Climate Service System (http://119.40.97.103/climateservice/) where short to long-term meteorological information (up to 30 years) and the analysis of the interaction of climate phenomena with economic assets and natural resources (e.g, livestock, crops, and infrastructures) are available.

3.3.2 Gaps and challenges

Hazard monitoring, observation, and forecasting

On hydrometeorological hazards, efforts have been made to expand ground, upper-air, and remote observation networks through international cooperation. However, the frequency of data collection and data resolution remain low. Satellite data from Japan and Korea are often beyond the scope of observation for Mongolia. In addition, the quality of observation data deteriorates due to suboptimal conditions of the observation sites, aging equipment, and the limitations in maintenance measures in the event of failures or equipment malfunctions. One of the two radars, which was recently installed, is not operational due to data quality issues. Substantial climate variations between summer and winter partly contributed to the durability of the equipment.

NAMEM has already built some operational systems, such as Observation Data Collection, Weather Chart Analysis, and real-time video monitoring. Some other projects to build and improve the system have been underway, but there are still limitations in sharing real-time disaster data between ministries and agencies due to issues related to system compatibility and internal statistical analysis functions. Additional data processing is required to facilitate data sharing due to the lack of linkage between the systems.

While the weather forecast periods in Mongolia are not much different from those in advanced countries, there is an issue with short-term forecasts. Short-term forecasts are primarily produced on a daily basis for broad regions with a focus on major cities, resulting in insufficient temporal and spatial resolution for the forecasts. There is a lack of technical and computing resources for developing and testing various numerical forecast models. Increased computational and storage resources are required to support the development of higher precision forecasting systems. In addition, there is missing observation data due to the instability in the communication network.

The time taken from earthquake detection to automatic notification is about 3 minutes, which is relatively slow compared to the speed of earthquake propagation.

Dissemination of warnings and risk information

The predominant methods of information dissemination (homepages, TV, radio, Facebook, etc.) rely on individuals actively finding and confirming information themselves. Relatively, there is some lack of methods for direct public access (electronic signs, sirens, text messages, etc.). The siren towers, as well as TV and radio stations, and electronic display boards used in the disaster warning system, have become outdated, and the number of available equipment is decreasing. Since text messages rely on mobile carrier subscribers, it is difficult to provide information to each region effectively. There is also a lack of information provision for rural residents or information-vulnerable groups (disabled, elderly, children, foreigners, etc.). The consultation with stakeholders indicated a need of disseminating the messages beyond warning of an event. How to prepare for the event, the steps that the recipients of warnings can and should do is not part of the current early warning messaging.

Disaster-related statistics

Availability of losses and damages in economic term data is still weak. The methodologies for calculation of direct economic loss were recently developed and there are limited entities who are able to fully utilize those methods to calculate economic losses. Calculation of indirect economic loss remains a challenge in Mongolia.

3.3.3 Recommendations

Observation networks, quality of observation and forecasting

Recommendations	Urgency	Ease of implementation	Cost
Expand the observation networks and increase the use of internal and external data sources (e.g., FY-series data), radar data, as well as data from the military or other ministries, CCTV video footage from the police) to enhance available resources for detection.	Urgent	Easy to implement	Low budget
Systematically manage the operation of the existing equipment by securing budget in advance, assigning personnel in charge of the maintenance of the warning and observation network (hydro-met, seismic) in each region, and analyzing the required lifespan for each piece of equipment.	Not urgent	Complex	Low budget
Formulate capacity improvement plans and actively carryout data-sharing and technical cooperation with the neighboring countries to gradually improve monitoring and early warning capacity of meteorological disasters such as sandstorm, dzud, blizzard and urban waterlogging.	Not urgent	Complex	Low budget
Generate and calculate Mongolia-specific data and models to support forecasters' analysis based on the existing numerical model data from other countries. There is a need to improve forecast performance and provide more detailed forecasts by engaging numerical forecast model experts through long-term dispatch and recruitment through international cooperation.	Not urgent	Complex	High budget

Recommendations	Urgency	Ease of implementation	Cost
Enhance the localization of technology based on the available models by incorporating Mongolia's detailed topography, vegetation, and climate characteristics.	Urgent	Complex	High budget
Enhance input data by expanding the collection of high-quality observation data and to utilize ensemble models that actively incorporate advanced IT technologies such as Artificial Intelligence (AI).	Not urgent	Complex	High budget
Introduce high-performance computer resources for the future development and execution of advanced and precision numerical forecasting and modeling.	Urgent	Easy to implement	High budget
Develop impact-based forecasts tailored to specific fields, targets (disaster prevention-related agencies, nomads or the general public), and time periods for each weather event. Set the priorities for different types of disasters and proceed in stages.	Urgent	Complex	High budget
Conduct research and standardization for impact-based forecasts in various fields, and communicate and cooperate actively with the relevant ministries in each field.	Not urgent	Complex	High budget

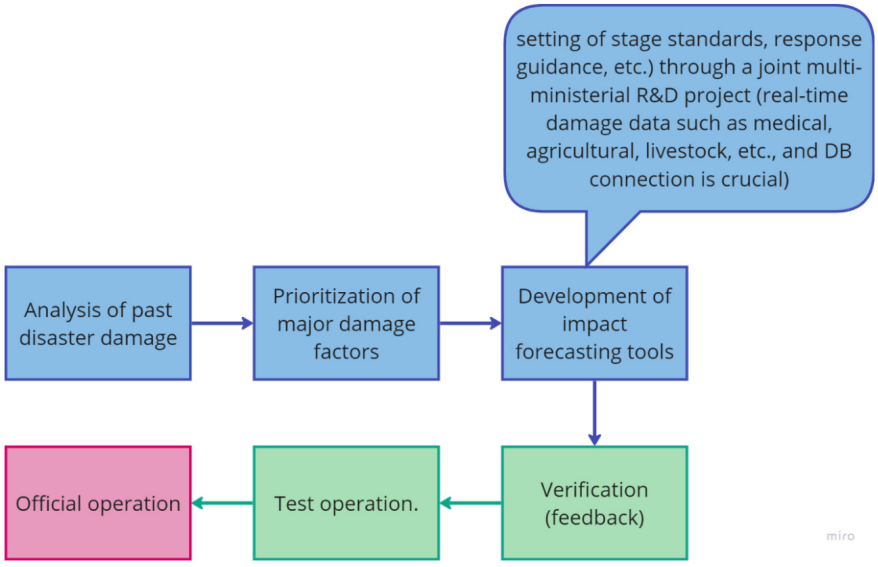

Figure 11. Example of the process to develop impact-based forecasting,

Communication and dissemination of warnings and risk information

Recommendations	Urgency	Ease of implementation	Cost
Strengthen the provision of immediate and direct information, such as electronic signs and sirens. Prepare a plan for text messaging that provides information by risk area based on the Cell Broadcast System method endorsed by the World Meteorological Organization.	Urgent	Complex	High budget
Supplement the information dissemination system through active use of social communities, especially at local-level, and production of customized information for vulnerable groups.	Urgent	Easy to implement	High budget
Expand communication network upgrades, including the transition to 4G and 5G technologies, starting from Ulaanbaatar and main cities. For remote locations, supplement the satellite communication networks with satellite communication infrastructure (signal receivers and transmitters). Consider the introduction of communication networks using microwaves.	Not urgent	Easy to implement	High budget
Develop a set of tailored messages for different audiences for different levels and types of disasters to be disseminated to provide a combination of i) warnings and ii) assist the population to prepare/ act.	Urgent	Easy to implement	Low budget

Risk assessment

Recommendations	Urgency	Ease of implementation	Cost
Undertake risk assessments based on the Ulaanbaatar Fault scenario which potentially becomes a catastrophic earthquake scenario considering the exposed population (i.e., more than 50% of Mongolia's population residing in Ulaanbaatar area and expanding urban and peri urban settlements).	Urgent	Complex	High budget
Invest more resources to understand the strength of the existing building stock in the Ulaanbaatar area and promote research and development of engineering solutions for seismic resistant buildings.	Urgent	Complex	High budget

Risk information platform

Recommendations	Urgency	Ease of implementation	Cost
Ensure that all existing risk information platforms are utilized by ministries to integrate, manage, and understand disaster information across sectors before creating a new platform. An inter-sectoral/ ministry mechanism for the standardization of the system, database structure, and other frameworks is recommended to ensure compatibility among public systems and maximize the user base.	Urgent	Complex	High budget

3.4 Financing

3.4.1 Strengths

Mongolia has multiple fiscal tools that can be used to finance the actions for disaster risk reduction and climate change adaptation, and the options for financial tools are also evolving.

Fiscal tools

There are several fiscal tools available in Mongolia.

- 1.0% budget allocation. This is a provision in the Law and Disaster Protection 2017 which mandates all administrative, territorial units and government organizations to allocate at least 1.0% of the annual budget for disaster protection and risk reduction activities.
- State Reserve and Provincial Reserve, 30% of which can be used for disaster protection and recovery/reconstruction.
- Local-level tax revenue such as Natural Resources Fee (see sector chapters for Environment and Agriculture for details or other fee structure)
- Performance-based supplementary budget allocation by the Ministry of Finance

According to the Ministry of Finance, there is a budget tagging mechanism for disaster risk management/reduction and climate change actions, which allows for a tracking of the public resources allocated for those activities.

Since its introduction in 2017, local governments are increasingly taking advantage of the provision of 1.0% budget allocation for disaster risk reduction. According to the mid-term report for Sendai Framework for DRR by the Government of Mongolia, there has been a four-time increase in budget allocation for DRR over the past five years at provincial (Aimag) level. The latest information provided by NEMA shows that an average of 2.5% of budget is allocated for DRR in 2022, and 1.16% in 2023 across provinces (aimag), districts, and Ulaanbaatar city.

The table below summarizes the budget allocation for DRR at the provincial (Aimag), District, and Municipality (here only Ulaanbaatar city).

Table 1. DRR budget allocation for provinces (Aimag), districts, and Ulaanbaatar city (source: NEMA) , Exchange rate 1 US dollars = 3444.6 Tugrik (Rate for 2022 by National Statistics Office)

Row Labels	Sum of 2022 DRR budget USD	Average of 2022 share of the budget	Sum of 2023 DRR budget USD	Average of 2023 share of the budget
Aimag	$3,680,577.96	1.94%	$2,340,670.40	0.66%
District	$1,080,531.85	3.42%	$1,369,244.61	2.33%
Municipality (Ulaanbaatar)	$11,187,772.17	2.90%	$7,681,356.33	1.04%
Grand Total	**$15,948,881.97**	**2.25%**	**$11,391,271.34**	**1.16%**

The charts below present the proportion of DRR budget allocation by province (Aimag), district and Ulaanbaatar city. Note that the NEMA's DRR budget information is based on the figures reported by respective sub-national government focal points and there is a slight variation in how the local governments might have interpreted DRR budget in their reporting. Some local governments could have accounted for a portion of state reserve fund on top of the annual budget allocation for DRR per the Law on Disaster Prevention 2017.

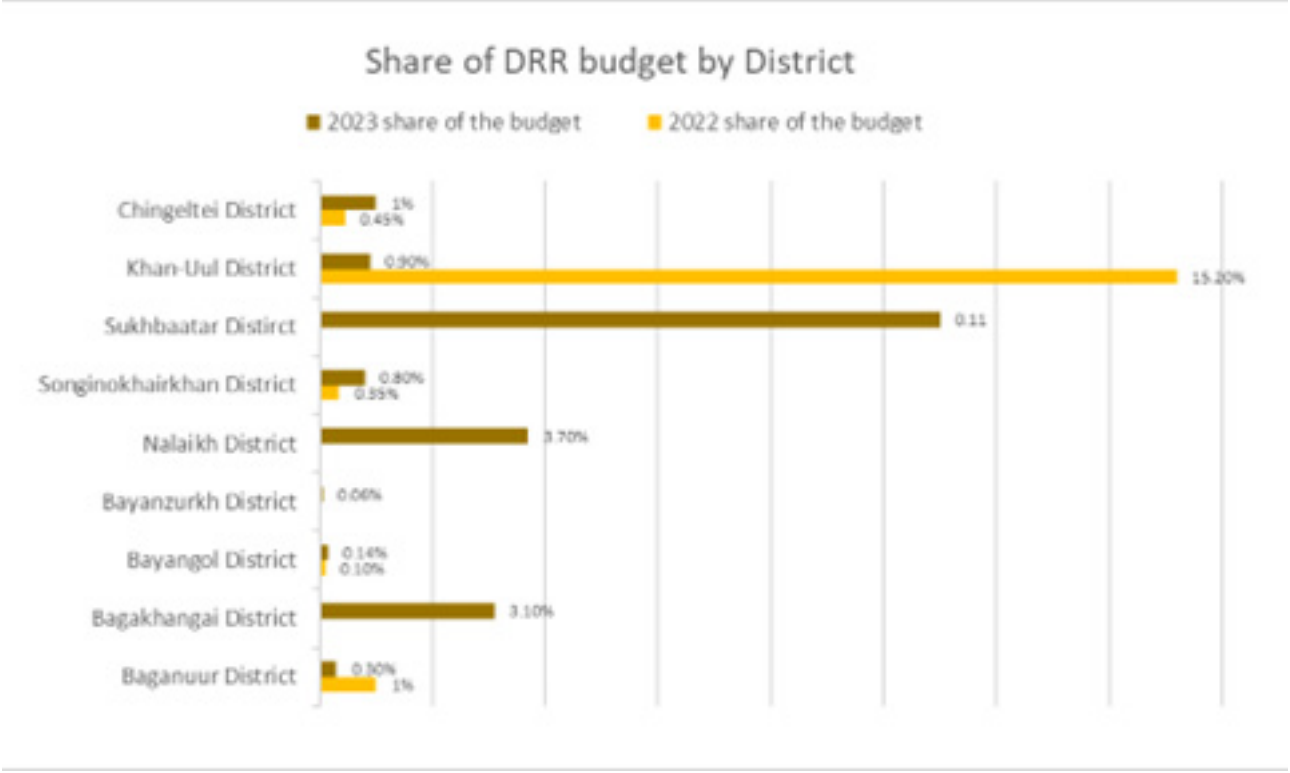

Figure 12: Share of DRR budget by District

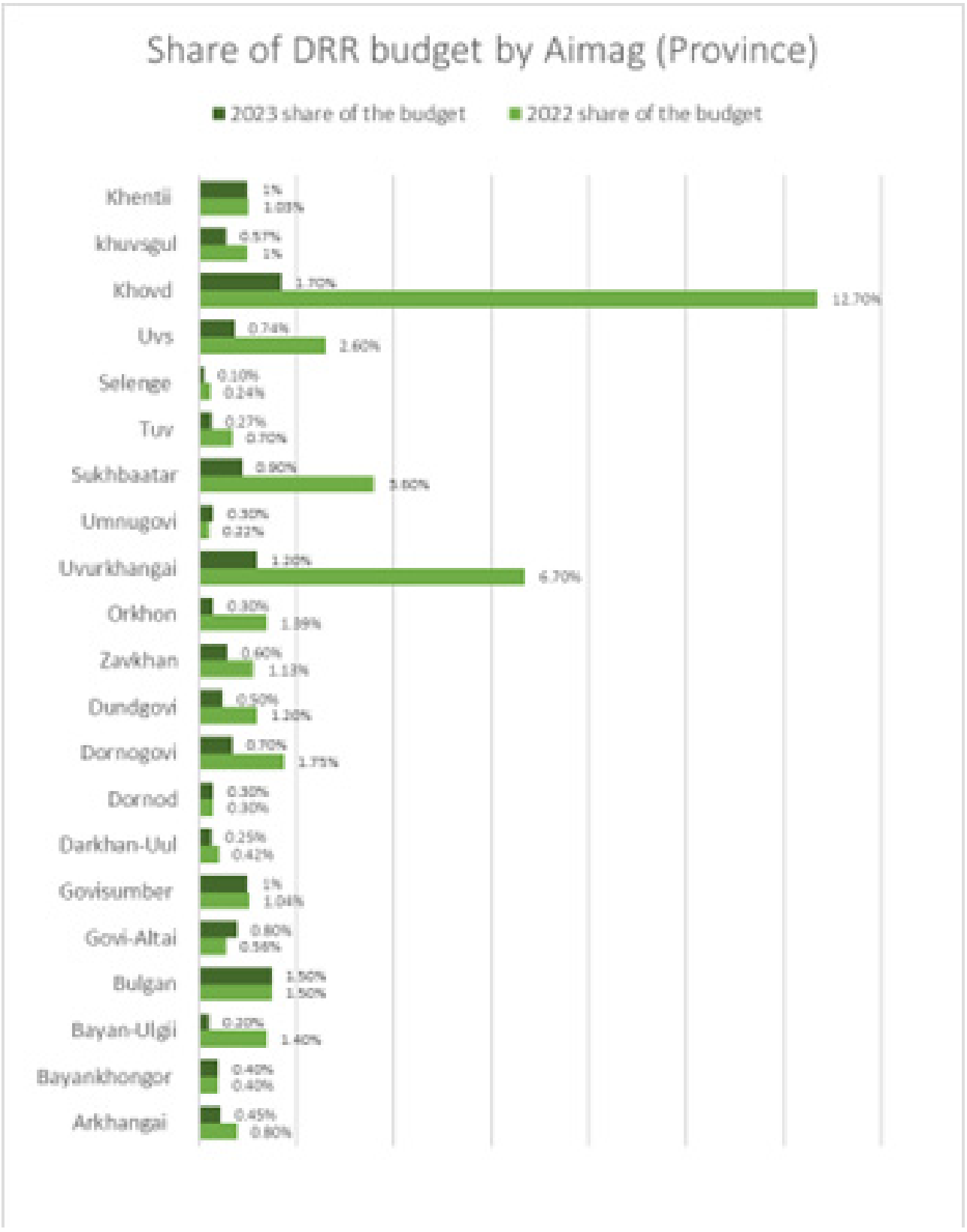

Figure 13: Share of DRR budget by Aimag (Province)

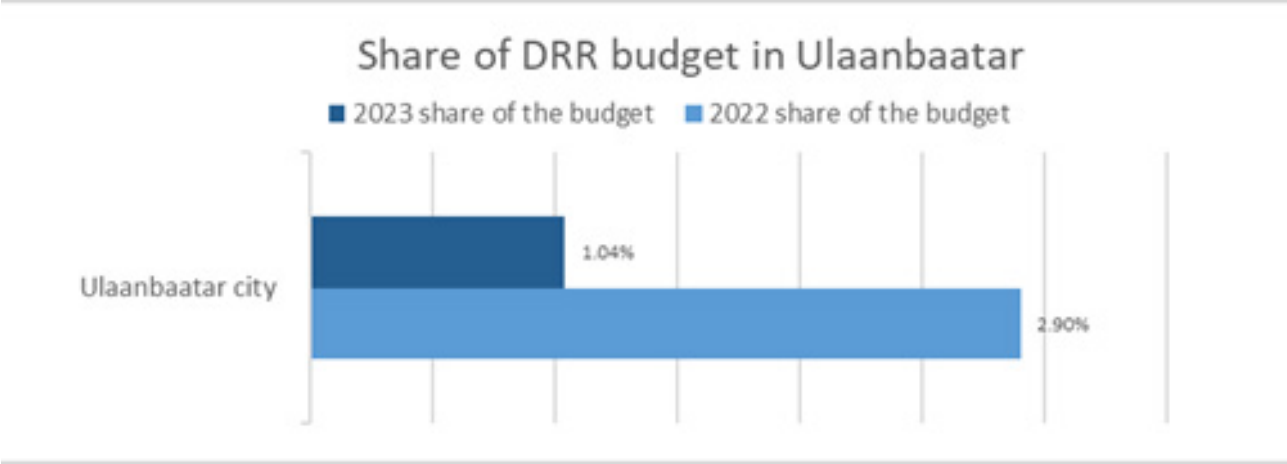

Figure 14: Share of DRR budget in Ulaanbaatar

The Law on Disaster Protection 2017 also has a provision of a budget allocation for private sector entities. According to the law, "all legal entities shall plan and spend at least 1.5 percent of the annual production and service costs". However, there is no system of accounting budget allocation by private entities and the status of the implementation of this provision is not clear.

Financial tools

Mongolia has a few State-sponsored index-based insurance for some agriculture assets such as livestock[13] and crop (wheat) against extreme weather. Index-based insurance provides compensation based on a percentage of the overall loss incurred in a region, rather than the actual losses incurred by individual herders or agribusinesses. Compensation for the loss is covered through a partnership between private and public insurance companies, depending on the percentage of loss exceeding the region's threshold. For example, losses up to 5% are considered insignificant and are not covered by index-based insurance. Losses between 6% and 25%-30% are covered by private insurance companies, while losses above 25% are covered by the Mongolian National Reinsurance Co. Ltd.[14] There are regular public information sessions conducted across the country by the Bank of Mongolia, the Mongolian National Reinsurance, and the Financial Regulation Committee to educate the public on the risk insurance scheme, financial management, and risk management.

There are various risk insurance options through private sector in Mongolia. There are currently 17 private insurance companies that provide a range of insurance products, including that for building properties, vehicles, against multiple disaster risk such as earthquake, flood, fire, and other most prevalent disasters in Mongolia. The commercial banks, including Khan bank (offering a 1.2% discount per annum) and State bank (providing up to a 2.6% discount per annum), promote risk insurance with an embedded interest rate discount feature in loans for herders. This discount is applicable if all of their livestock are insured through index-based livestock insurance. Additionally, Golomt bank is proposing to allow the payment of insurance premiums in monthly instalments over the year for mortgage loans, while other banks require a lump-sum premium payment once a year. Commercial banks, in their lending practices, often stipulate the necessity of property, vehicle, and lender's life insurance for various types of loans, such as mortgage and vehicle loans. This requirement is established to minimize the potential for significant financial losses that could arise in the event of unforeseen disasters or adverse circumstances. Small private insurance companies frequently find themselves without reinsurance coverage, a situation that can

have profound economic ramifications, especially in the wake of a disaster. Reinsurance serves as a vital safety net for insurance companies, both large and small, by helping to spread the risk associated with catastrophic events.

From 2009 to 2014, the United Nations Development Programme operationalized a micro-insurance programme to assist vulnerable groups and women, including households with below-average incomes and small businesses, working with some private insurance companies as part of their corporate social responsibility programme. The insurance product provided coverage for various risks, encompassing fire, natural disasters, and losses resulting from electrical impairments and third parties. It insured houses, equipment, and sustained income during disaster periods. The product featured a remarkably low insurance premium, typically ranging from 5,000 to 10,000 tugrugs in the form of a card and was easily accessible in proximity to the respective areas. However, the product experienced limited adoption, primarily due to the low-income levels of households and a lack of awareness among the target audience.

The Mongolian government is working on multiple pieces of legislation, including crop insurance[15], residential property insurance for earthquake risk[16], and disaster risk insurance.[17]

National Green Finance is a mechanism to engage the financial sector's resources to fund green initiatives. For example, annually, a substantial amount of funds is mobilized through commercial banks to support "One Billion Trees" through this mechanism.

External financial support

Various international funds have been invested in enhancing climate change resilience capacity. Among others, the Asian Development Bank (ADB) has a budget investment plan to improve Mongolia's early warning system.

Mongolia receives different funds for projects, initiatives and programmes that have DRR or CCA components, including from bilateral, multilateral sources as well as from the UN, the Mongolian Red Cross Society and NGOs. An analytical mapping conducted in August 2023 by the CADRI Partnership has identified 108 programmes from 26 humanitarian and development partners[18]. in DRR and CCA in Mongolia with around 68% addressing multiple hazards, ranging from central to community levels. As of August 2023, 59 programmes were ongoing, 5 in the pipeline and 44 completed. Among the ongoing activities, most are financed by multilateral partners (34) and the UN (18), focussing on agriculture and food security (17). Cross-sectoral (13) projects were identified.

According to the OECD (2023), Mongolia received in 2021 USD 234.5 million for climate-related development, including for mitigation and adaptation measures. Most investments are in the Agriculture, Forestry and Fishing as well as the Transport and Storage sectors.

3.4.2 Gaps and challenges

While overall budget allocation for DRR shows progress, the current level of information does not explain what types of DRR measures are covered under the budget, and budget tagging for DRR/CCA is not widely utilized. According to Mongolia's Sendai Framework Midterm Review, the planned expenditures for disasters, hazardous events, and incidences, response and recovery measures have increased by 88.4%. Similarly, expenditures for preparedness for potential dzud hazards increased by 9.2 percent (stocking hay and fodder), and the expenditures for providing vehicles, gers, warm clothing and other necessary goods by the state reserve increased by 9.2 percent[19]. Consultation

with Sukhubataar and Uvs Provinces indicated that the province utilized 1% budget allocation for constructing garage space for fire brigades (Sukhbataar) and purchasing communication equipment (Uvs). The consultations with various sector departments (agriculture, environment, education, construction & urban development, local government investment division, and local meteorological office), indicated that they struggle to secure sufficient budget to carry out the activities that are considered as tangible ex-ante risk reduction/mitigation.

Existing fiscal and financial policies do not sufficiently consider a potential catastrophic scenario due to disasters where large amount of public expenditure is suddenly required or high level of loss of GDP is expected (e.g., Emeelt fault earthquake scenario with a potential of a loss of 25% of GDP through building collapse).

Risk insurance industry in Mongolia requires improvement in availability and accessibility to accurate and strong risk information, including historical losses and damages, to have better estimation and calculation of premium. It also faces lower-than-average (global) penetration and density across society. Often, investing in risk insurance is not an option for those who struggle to make the end meet, yet are to bear more impact of disasters than others.

Currently, there is no comprehensive disaster risk reduction financing framework/strategy. In Mongolia, much work has gone into disaster risk financing which focuses on financing disaster response (contingency) as opposed to disaster risk reduction financing which is about financing prevention-oriented DRR and CCA investments.

Disaster risk financing uses the risk layering approach to finance the damage and emergency costs resulting from disasters. In other words, the frequency and severity of disasters determine the financial instrument used. Insurance Instruments are often recommended as a way to reduce the damages and emergency costs caused by disasters with low frequency but high severity. It is important to note that Insurance does not reduce disaster losses but transfers risk and this can lead to a number of other financial and economic problems if the insurance sector is not well supervised and managed. Disaster risk reduction financing is based on prioritizing DRR and CCA investments. Once these investments are prioritized, the most cost effective financial instrument to finance them is determined. In disaster risk reduction financing, probabilistic cost-benefit analysis is used to find the indirect effects of disasters (because cost-benefit analysis must include direct and indirect costs).

Examples of disaster risk financing are insurance, contingent financing, and contingency reserves and reserve funds

3.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Integrate disaster risk reduction and climate change adaptation into sector policies and plans create an enabling environment for fiscal allocation. It is recommended that a department or division of the Ministry of Finance takes a leading role in guiding DRR budget, and a budget execution plan should be established through a consultative body between ministries, including NEMA, to optimize available budget.	Not Urgent	Complex	Low budget
Provide guidance to sector departments, local governments, and elected local representatives to have an improved knowledge on tangible risk reduction solutions for specific sectors for specific hazards based on the cost and benefits analysis. Make use of the manual for members of National and Local Councils for Disaster Risk Reduction and State and Local Disaster Protection Services (2023, draft)	Not Urgent	Easy to implement	Low budget
Enhance the overall budget allocated for resilience building in the areas of maintenance or strengthening of critical and disaster prevention infrastructure and buildings; risk-informed planning and policy design process; end-to-end multi-hazard early warning systems; research and development for technology and engineering solutions and education.	Urgent	Complex	High budget
Promote the existing legal provision of 1.5% budget allocation for the legal entities as a tool/incentive for private companies to protect their business and the local communities against potential disasters as part of ESG and CSR, and to develop solutions (technology and human resources) that contribute to disaster and climate risk reduction. "Sustainable bond" or "resilience bond" could be also one of many ways to collectively invest into resilience building as a society.	Not Urgent	Complex	Low budget

Recommendations	Urgency	Ease of implementation	Cost
Strengthen disaster risk reduction financing (c.f., disaster risk financing) as the basis for the Ministry of Finance to strategize the right mixture and volume of investment through fiscal and financial policies, as part of Mongolia's existing Integrated National Financing Framework[20].	Not Urgent	Easy to implement	Low budget
Establish clear definitions of disasters and their measurements, supported by stronger historic data on losses and damages to support the disaster risk reduction financing. It is important that the risk transfer mechanism is used as a complementary tool to the overall disaster risk reduction financing to address the residual risk after mitigating disaster and climate risk through other structural and non-structural measures prior to disasters	Urgent	Complex	Low budget
Develop a recovery and reconstruction framework which encompasses the fiscal and financial readiness for catastrophic events based on the existing knowledge of risk, and drawing the lessons from experienced countries. Advancing the conversation on the Central Asia risk pool mechanism is one of the options.	Urgent	Complex	High budget

3.5 Implementation

Implementation capacities are analysed from the availability of operational procedures and the capacities of human resources to perform required functions. While the diagnosis of human resources capacities was primarily based on the observation through the consultations with relevant responsible divisions and departments, NEMA/LEMA staff's functional capacities for disaster risk reduction were assessed through a survey.

3.5.1 Strengths

Disaster Risk Reduction

Mongolia has the methodologies and standards established for risk assessment and the collection of disaster-related statistics, ready to be used by the national and local administrations for the purpose of designing disaster protection plans and post-disaster losses and damages accounting. The risk assessment methodologies are available for ten major hazards (drought, dzud, building fire, steppe fire, earthquake, flood, chemical accident, radiation accident, livestock and animal highly infectious diseases and zoonotic illness, and open-mine and underground mine) and the

risk assessment standard Mongolia MNS ISO 31000:2020 Risk Management: Guidelines ensures the quality of risk assessments undertaken by both the public and private entities.

Early Warning

The roles and duties of respective institutions that are responsible for monitoring, observation, and forecasting of hazardous events both at the national and local level are defined well through the government resolutions, directives and operational guidelines. Thresholds for executing warnings are in place both for hydrometeorological hazards and seismic hazards.

While local hydrometeorology offices operate with a minimum allocation of human resources and equipment, operational guidelines for observation data transmission and warning disseminations are dully followed.

Similarly, the Institute of Astronomy and Geophysics (IAG) of Mongolian Academy of Sciences has a solid team of scientists and the monitoring capacity of seismic activities, despite the continued need of technical capacity expansion.

Operational protocols are in place and practiced between NEMA, NAMEM, and IAG for the transmission of warnings (between IAG and NEMA, and NAMEM and NEMA) and dissemination of warnings to the public.

Preparedness for response and recovery

NEMA has a strong foundation for disaster response with the existing operational protocols, technical guidelines/standards, in-house training mechanisms, and regular budgetary allocation for the functions required for those operations.

ISO certification of the local emergency management authority (LEMA) offices ensures the minimum levels of readiness for response. National and local emergency operation centres (EOCs) are equipped with basic lifesaving and firefighting equipment, post-disaster response mechanism, and good communication devices and operational tools such as maps, with trained human resources. EOCs are well connected vertically and horizontally with the concerned government agencies, departments, and officials ready to be mobilized at the times of need and emergency. The country is currently building medium-level urban rescue and search per INSARAG[21] standard, and already has the basic capacity for search and rescue (SAR) and firefighting, combined with lifesaving equipment.

NEMA's human resources trainings entails regular in-house training programme, the programme through the Police Academy' Internal Affairs Unit, Emergency Management Academy (B.A., M.A., Ph.D) to train the staff for practical skills in disaster response (search and rescue, firefighting) and to generate management-level staff.

Key humanitarian standard such as Core Humanitarian Standard (CHS) is SPHERE standards are available in Mongolian, ready to be used during the operations.

Mongolia has an aspiration to build a culture of whole-of-the-society where each segment of the society takes part in strengthening individual and collective resilience. There is a regular training programme run by NEMA and targeting citizens and schools on lifesaving skills as part of the National Programme of Community Participatory Disaster Risk Reduction (2015-2020, 2021-2025). At schools, there is an extra curriculum subject introduced in 2019 on safe life skills at

kindergarten, general education, and higher education.

The Government initiated a simulation exercise with an earthquake scenario in the Ulaanbaatar area. The recent earthquake simulation exercise in which took place over three days in May 2023 prepared the government services, schools, communities, and non-government entities in the earthquake scenario.

In Mongolia, there are more than 300 national and international non-government/civil society organizations among which several are active in disaster risk management (mostly emergency response and preparedness), environmental protection, including biodiversity, forestry, water and soil management[22]. Some of the organisations with regular disaster risk management activities include World Vision, People in Need, Mongolian Red Cross Society, and Save the Children. NGOs are part of the extended Humanitarian Country Team coordinated by the UN RCO and the Government of Mongolia during crisis/emergency.

3.5.2 Gaps and challenges

Disaster Risk Reduction and Climate Change Adaptation

The gaps in implementation capacities are evident in translating the policies and plans into tangible risk reduction measures. Often, those gaps are interlinked with various factors such as the competencies of human resources (technical and functional knowledge) and the availability of financial resources. The stakeholder consultations indicated that the sector ministries and departments have the technical know-how to implement the measures for disaster risk mitigation and climate change adaptation, but they are experiencing a difficult time to secure predictable financial resources to implement. On the other hand, it was also indicated that the coordinating entities such as NEMA/LEMA and the leaders and planning officers at the local government have the power to allocate financial and human resources but may not necessarily have the adequate knowledge about the need of sector-specific interventions for ex-ante disaster risk reduction or climate change adaptation.

On the operational procedures, the risk assessment guideline has limited focus on addressing the unique vulnerability of the most at-risk populations such as people with disabilities, elderly people, women, and children. In addition, disaster risk assessment potentially has an overlapping element with environmental risk assessment which is also compulsory to the governments and private sector entities.

Early Warning Systems

Currently, it is difficult to find specific guidelines/ manuals because they are not categorized by disaster type, field, class, or organizations responsible for actions. Effective early warning systems involves not only NEMAM, IAG, NEMA but other parts of the governments and non-governments who are involved in early actions. Hence, operational and procedural guidelines are required for the system of activation of a chain of response actions for different sectors by government and non-government entities.

Early warning systems training tends to be organized as one-off event-oriented programs once a year and not systematically carried out. As a result, the relevant departments of emergency management are not clear about the official and authoritative release channels of the weather forecast.

Preparedness for response and recovery

NEMA's operational capacity for response is strong and there is a strong attention for the continued capacity enhancement. A gap is observed in the mechanism of transition from response operation to early recovery, and long-term recovery and reconstruction which requires clearer demarcation of roles and responsibilities as well as stronger coordination with the line ministries and local governments. This gap was felt strongly in the aftermath of the recent major flood disasters in 2023. Under the current set-up, there are some confusions on up to what point NEMA/LEMA takes a leading role in response operation and from what point local governments and line ministries should start recovery operation.

The human resources capacities for firefighting and search and rescue are trained separately with a clear demarcation of functions and responsibilities. However, situations on the ground often demand a hybrid of those capacities. For example, there are cases where search and rescue operations are required when only firefighters are available but not allowed/trained to save the lives outside their duties.

NEMA/LEMA capacity self assessment

A rapid self capacity assessment was conducted for the officials of NEMA and LEMA in December 2023. A total of 80 senior officers, sergeants, and officers responded (female 13, male 67).

The survey results show the extent of confidence in their functional capacities and knowledge required for disaster and climate risk reduction and management. Note that the survey was purely based on perception of individuals and not intended as an objective assessment or test of their knowledge. The full survey result is available as Annex of this report. In this section, some of the noteworthy points are highlighted.

Among the respondents, about 30% answered that their responsibilities fall under emergency and fire fighting operations. 16% of the respondents associated themselves as part of the implementation of disaster risk management plan, including risk reduction measures. About 15% of the respondents answered that they are responsible for disaster risk assessments.

The respondents generally expressed a modest level of confidence ('faire') in the knowledge of various natural hazards such as drought, dzud, extreme weather, forest and steppe fires, urban fires, and human and animal infectious diseases. The level of confidence appears higher for flood hazards for which 67% of the respondents said that they had 'good' knowledge. However, it was evident that there is a need for improvement in the knowledge of earthquake hazards – 58% answered that their knowledge of earthquakes is poor.

Across the board, officials appear to be confident in the knowledge of laws and regulations. However, when it comes down to the functional capacities such as emergency operation, post-disaster recovery and reconstruction coordination, and guiding others on DRR measures for specific disaster scenarios, there is a room for improvement.

Understanding the level of capacity of human resources to undertake certain functions and responsibilities is critical but it requires definition of required capacities to fulfil the responsibilities for particular functions as NEMA/LEMA across the cycle of disaster risk management – mitigation/prevention, response, and recovery.

3.5.3 Recommendations

Disaster Risk Reduction

Recommendations	Urgency	Ease of implementation	Cost
Review and update the risk assessment guideline to strengthen the engagement of the at-risk population (people with disability, elderly people, women, children) in the process of risk assessment; and to eliminate potential duplication with environmental impact assessment guideline for streamlining.	Not Urgent	Complex	Low budget
Establish a minimum set of functional capacities for disaster risk reduction required for NEMA/ LEMA staff , to continue regular assessment and enhancement of staff capacity.	Urgent	Complex	Low budget
Strengthen existing training curriculums at the Emergency Management Academy by integrating the essentials of disaster risk reduction, in addition to the existing emergency management modules. The training should be open to outside NEMA as well so that it will contribute to generating broader range of public servants knowledgeable in disaster risk reduction from local governments, and sector ministries and departments. Utilize the Disaster Risk Management Manual for members of National and Local Councils for Disaster Risk Reduction, and State and Local Disaster Protection Services (2023, draft).	Urgent	Easy to implement	High budget
Establish partnership with domestic academic institutions and the established DRR training institutes/courses for public service officials in other countries to strengthen the domestic curriculum.	Urgent	Easy to implement	Low budget
Establish a system-wide operational procedures and protocols to connect warnings with the preparedness for actions both by the government and the citizens to act. Monitoring, observation, forecasting, and dissemination of warnings are part of a whole value chain of early warning systems or “end to end” early warning systems.	Urgent	Complex	High budget

Effective Early Warning Systems – from warning to early action

Recommendations	Urgency	Ease of implementation	Cost
Establish a system-wide operational procedures and protocols to connect warnings with the preparedness for actions both by the government and the citizens to act. Monitoring, observation, forecasting, and dissemination of warnings are part of a whole value chain of early warning systems or "end to end" early warning systems.	Urgent	Complex	High budget
Review the effectiveness of the existing early warning system based on the recent major disaster scenario (e.g., Dzud in May 2023 and floods this summer) to identify areas for improvement.	Urgent	Easy to implement	Low budget
Recalibrate the operational procedures by establishing guidelines that integrate a response/ early action mechanism by sector for each disaster scenario with the roles of specific entities in the system (e.g., a flood response manual encompassing all key public and private institutions and citizens). In doing so, make sure that accessibility to manuals is improved through a search function categorized by sections and a separate page, allowing manuals that can be used as reference in actual situations to be accessed quickly at any time.	Urgent	Complex	Low budget
Establish a regulation to institutionalize reviewing and updating of early warning systems operational procedures and manuals after every major disaster.	Urgent	Easy to implement	Low budget
Increase the exposure of civil organizations and all members of society to the operational guidance through (e.g., organizing regular curriculum, mandating the display of disaster response guidance when operating outdoor electronic signs, establishing a support system for the production of disaster-related movies, dramas, comic books, etc.).	Not Urgent	Easy to implement	Low budget

Preparedness for response and recovery

Recommendations	Urgency	Ease of implementation	Cost
Establish necessary operational protocols, roles and responsibilities for NEMA, local governments, and line ministries on the transition from disaster response to recovery. Refer to the international standards and approaches such as SPHERE, Core Humanitarian Standard, initial rapid assessment (IRA), multi-sector IRA (MIRA), post disaster needs assessment (PDNA), Disaster Recovery Framework (DRF).	Urgent	Easy to implement	Low budget
Establish humanitarian assistance hubs in all airports and border customs offices and their functions are strengthened over time (customs clearance and storage capacity).	Urgent	Easy to implement	High budget
Consider cross-fertilisation of the capacities for search and rescue and firefighting. For example, human resources primarily trained for firefighting can be given some extent of other life-saving rescue skills.	Urgent	Easy to implement	Low budget
Mainstream disaster risk reduction and climate change adaptation into all development plans, its implementation and monitoring to sustain development gains and reduce disaster risk due to new development initiatives.	Urgent	Easy to implement	Low budget
Roll-out large scale capacity development of both elected representatives and civil servants from local to national levels on different aspects of disaster risk management/ reduction (DRM/R), climate change adaptation (CCA) and its mainstreaming in all development plans and policies.	Not Urgent	Complex	High budget

Photo: UNDP/Mongolia

4. PRODUCTIVE SECTORS - ENVIRONMENT

Due to its geographical location, climate characteristics, and the climatic dependence of its economic sectors, Mongolia is considered one of the countries most vulnerable to climate change. Water and forest resources, pasturelands, and biodiversity are expected to be significantly impacted by changes in temperature and precipitation patterns. Drought, dzud, forest and steppe fires, snowstorms, floods, and extreme cold constitute major disasters in the country. Around 81% of these disaster events are attributed to strong winds, rainfall, and thunderstorms. The frequency of natural disasters has doubled over the past 20 years. Annual damage costs are estimated to be approximately 50-70 billion MNT. Livestock loss is projected to increase by about 50% by the mid-century compared to current levels, with losses expected to double by the end of the century.

Mongolia became a party to the UN Convention to Combat Desertification in 1996. The National Program on Desertification was adopted in 2010, followed by the enactment of new legislation on Soil Protection and Prevention from Desertification in 2012. In 2020, the Information and Research Institute of Meteorology, Hydrology, and Environment (IRIMHE) conducted the 5th national study on desertification and updated the country's Desertification Map and Atlas. According to this study, 76.9% of Mongolia's territory has been affected by desertification to varying degrees: 4.7% at a very strong level, 18.6% at a strong level, 22.1% at a moderate level, and 31.5% at a slight level of desertification and land degradation, respectively. The recent report to UNCCD indicates a decline in land productivity, affecting 8.9% of the total land area. This decrease is primarily attributed to drought conditions and exacerbated by increased overgrazing. Weak institutional and governance structures, economic factors, along with deficiencies in science, knowledge, technology, and cultural aspects have been identified as the indirect drivers of land degradation at the national level.[23]

Mongolia is home to two major forest biomes: the boreal forests in the north, which cover 14.2 million hectares (87%) and are predominantly composed of larch and birch, and the saxaul forests, spanning 2.0 million hectares (13%), in the southern arid regions. These saxaul forests are considered as 'forest' under national definitions. The northern boreal forests lie in a transitional zone between the Siberian taiga to the north and the grasslands to the south, typically found on mountain slopes at elevations of 800 to 2,500 meters above sea level.

Mongolian forests are characterized by low productivity and slow growth, making them particularly susceptible to drought, fire, and pest disturbances. Forest deterioration has been exacerbated by permafrost melt. A significant loss of permafrost could lead to a corresponding decrease in forested areas. Post-disturbance, these forests struggle to regain ecological balance and exhibit low natural regrowth rates. This challenge is partly due to their location in the harsh continental climate of the northern hemisphere, which restricts vegetative growth rates and soil moisture content.

The water area, which includes land surfaces covered by water bodies, occupies 660.9 thousand hectares or 0.4% of Mongolia's total territory. Of this, 221.3 thousand hectares, or

33.5% of the water resources, are made up of rivers and streams. Lakes and ponds constitute 423.8 thousand hectares, or 64.1% of the water area. Streams and springs cover 13.2 thousand hectares, accounting for 2.0% of the water resources, while permanent snow and glaciers represent 2.6 thousand hectares, or 0.4% of the water resources.

According to the Mongolia Second Assessment Report on Climate Change (2014) there was an increase of 64 thousand hectares, or 13.3%, in the area affected by forest fires from 1999 to 2012, compared to previous years.

The environmental sector in Mongolia is facing significant challenges due to climate change, which is exacerbated by its unique geographical and climatic conditions. Here's a narrative that encapsulates the major aspects of exposure and vulnerability to climate change:

- **Permafrost and glacier melting.** In Mongolia, the melting of permafrost and glaciers is a critical issue. This phenomenon is leading to surface water shortages and the degradation of soil and pastures. The mountain ecosystems, forests, and biodiversity are suffering as a result of permafrost loss. This situation demands immediate research and action to preserve the unique genetic resources linked to the permafrost. Furthermore, the melting permafrost is damaging road infrastructure, increasing the costs of road maintenance significantly.
- **Water shortage.** Mongolia's water resources are under severe stress. The country operates a substantial network of hydrological posts to monitor this crisis. Notably, glaciers have shrunk considerably over the past 70 years, with the Potanin glacier experiencing significant melting at various altitudes from 2003 to 2020. This retreat is part of a broader pattern of diminishing snow and ice cover in the Arctic, which affects soil moisture regimes and freshwater sources in high mountain areas. The area of permafrost has alarmingly reduced from 63% of the total territory in 1971 to just 29.3% by 2016.
- **Forest degradation.** The forests of Mongolia are under threat due to an increase in forest fires, which are linked not just to human negligence but also to climate change-induced increases in air and soil temperatures and prolonged droughts. The prevalence of harmful insects and rodents, along with unfamiliar forest diseases, is on the rise due to these changes. The forest fires have increased in both frequency and intensity, indicating an acceleration of forest degradation. This is concerning as forests are vital carbon sinks and crucial in combating climate change.
- **Droughts, desertification, and pasture degradation.** Mongolia is experiencing more intense droughts and dryness, contributing to widespread desertification and land degradation. A significant portion of the country's territory is affected, with notable impacts on the characteristics of pastures. This leads to reduced plant growth and yield, weakening root systems, and exacerbating soil and pasture degradation. Overgrazing is also a contributing factor, especially in the forest-steppe and steppe regions, leading to further reduction in soil and plant productivity.

In conclusion, Mongolia's environmental sector is highly vulnerable to climate change, with significant impacts on its permafrost, water resources, forests, and pastures. These challenges not only threaten the natural ecosystem but also have broader implications for the national economy and social life. The situation calls for urgent and comprehensive measures to mitigate and adapt to these changes.

4.1 Governance

4.1.1 Strengths

The **Environmental Protection Law,** though not directly addressing disaster risk reduction and Climate Change Adaptation (CCA), requires compensation for environmental damages caused by misconduct. Environmental inspectors assess and determine compensation values.

Article 22 of the Environmental Protection Law covers natural disaster-affected areas, outlining joint implementation of prevention measures by various government bodies. The state budget covers repair costs for natural disaster damages, with identified responsible parties liable for compensation. Article 23 details how the government should respond to natural disasters and emergencies, focusing on mitigating impacts, eliminating harmful effects, and protecting the environment in declared state of emergency areas. Actions must align with the Constitution of Mongolia and the specific regulations of the state of emergency.

The 2012-revised **Environmental Impact Assessment (EIA)** Law regulates stakeholder relationships, guiding environmental impact assessments for regional and industry policies and programmes, aiming to minimize environmental impact, protect the environment, and prevent ecological imbalance. 'Strategic Environmental Assessment' (SEA), defined in Article 3.1.3, identifies potential environmental, societal, and health risks and impacts in the context of natural and climatic changes for national, regional, and sectoral policies and programmes.

In February 2023, the Government approved regulations for Strategic Impact Assessment, mandating sectoral ministries to conduct strategic assessments during policy development and submit reports for review. An expert council evaluates these reports, with conclusions presented by the government member responsible for environmental issues.

The **Law on Hydrometeorology** stipulates that:

- The Government is primarily responsible for leveraging hydrometeorological, environmental, and climate resource information to aid social and economic development. It also aims to prevent serious environmental hazards and pollution using this data.
- The MET develops state policies related to Hydrometeorology and environmental monitoring, oversees policy implementation, manages the national network, and approves programmes for data collection, processing, and analysis. It also has authority over forecasting, information dissemination, and monitoring weather-influencing activities.
- The National Agency for Meteorology, Environmental Monitoring, and Pollution Control provides timely hydrometeorological and environmental information, issues warnings, and addresses pollution issues.

Aimag and Soum Governors are responsible for disseminating information, organizing hazard prevention efforts, assessing disaster damages, revising regulations, and reporting to the national administration.

The National Action Program on Climate Change (NAPCC) was adopted in 2011 and encompasses both mitigation and adaptation activities. During the first phase of the programme (2011-2016), the focus was on strengthening the legal and institutional framework and capacity building. In the second phase (2017-2021), measures for both mitigation and adaptation were designed and implemented. However, there has been no assessment conducted to gauge the progress and effectiveness of the national programme. Administrative and territorial units, as well as legal entities, are mandated to allocate specific

percentages of their annual budget or production/service costs for DRR measures. However, there is a lack of rigorous monitoring of these allocations.

The Land Law governs land ownership, usage, and related issues for individuals, entities, and organizations, emphasizing the prevention of activities detrimental to human health, nature, national security, and ecological balance. The State Central Administrative Organization for land is tasked with implementing policies, managing licenses for land and cadastral activities, and overseeing land management funding. An environmental organization develops guidelines for land use, erosion control, and desertification rehabilitation. Local governmental bodies, including Citizens' Representatives Khurals and governors at various levels, play roles in monitoring legislation, approving management plans, and ensuring efficient land use while addressing violations.

Governors at the aimag, soum, and capital city levels are responsible for ensuring land and resources are used efficiently and protected according to law and agreements, addressing violations, and executing enforcement actions. However, there are no specific provisions for climate change adaptation or disaster prevention in land use plans, except for general guidelines.

Although specific measures for climate change adaptation are limited, general disaster prevention guidelines and responsibilities for land restoration are established. The national land management plan outlines a long-term vision for Mongolia's development, considering ecological and economic factors. Land users are responsible for restoring land damaged by their activities, with laws in place to ensure that damages caused to the land must be repaired at the responsible party's expense, reinforcing the obligation to maintain and protect land integrity.

The Ministry of Environment and Tourism, in collaboration with GIZ, is actively engaged in development of Climate Law. This initiative particularly aims at enhancing the accountability of sectors with high emissions in terms of monitoring carbon emissions, implementing mitigation measures, and handling adaptation actions of key sectors. Additionally, the legislation will outline the roles and responsibilities of the National Climate Committee concerning the national greenhouse gas (GHG) inventory, transparency in reporting, managing the carbon registry, carbon pricing, identifying projects eligible for carbon credits, and the ownership of these credits. Furthermore, regulations will be established for conducting climate risk and vulnerability assessments, as well as for guiding adaptation activities.

4.1.2 Gaps and challenges

Mongolia currently does not have specific climate change legislation, nor does it clearly define climate adaptation or provide methods for vulnerability and risk assessment in its legislative framework. Although national programmes were abolished in line with the Development Policy Planning and Management legislation, the National Action Programme on Climate Change (NAPCC) still outlines roles and responsibilities for sectoral ministries. Vision 2050, a long-term policy, aims to develop and implement a national climate adaptation programme, investigate a climate risk insurance system, and enhance early warning and disaster management capabilities. However, the lack of methodologies for assessing risks and vulnerabilities, as well as guidelines and regulations for executing adaptation strategies, casts doubt on the effectiveness of the current legislation, management plans, and their implementation.

Furthermore, there is an inconsistency between the Land Law and other natural resource utilization legislation, caused by various ministries independently developing policies and regulations. Clear coordination is missing between land use, state land possession rights, and the roles and responsibilities of communities, herders, and

entities in protecting and sustainably using natural resources.

Lack of clarity in the division of responsibilities in the CCA is crucial for maintaining the sustainability of human resources and preserving institutional memory in the scientific sector. This issue stems from the divided responsibilities, with the Ministry of Construction, Urban Development (MCUD) handling land use policy and the Ministry of Environment and Tourism (MET) overseeing natural resource management (NRM) policies. Achieving a balance between available and projected water resources, land, and overall ecosystems is critical.

Additionally, it's vital to calculate the reduction rate of livestock under the Pasture User Agreement (PUA) objectively, ensuring it matches the carrying capacities of pastures. This strategy should protect herders' income and respect social and gender equity principles. A thorough and robust policy framework is necessary to effectively navigate and support this initiative.

The existing fragmentation in sectoral policies, legislation, and institutional frameworks indicates a significant lack of integration. This gap hinders effective decision-making and policy implementation, underscoring the need for a more cohesive and coordinated approach. Given the vast expanse of the country, the Government of Mongolia frequently encounters challenges in enforcing forest sector policies and legislative acts effectively on the ground. The Billion Tree campaign offers a chance to explore low-cost, high-impact, and innovative approaches in forest governance. Implementing regulations that promote local community involvement in monitoring forest resources and reporting incidents of illegal logging or forest fires **should be strengthened.**

4.1.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Establish clear and distinct roles and responsibilities within existing institutions involved in Climate Change Adaptation (CCA).	Urgent	Complex	Low budget
Incorporate assessments of climate risk and vulnerability into national and local development plans across all sectors, such as social, health, and education	Urgent	Easy to implement	Low budget
Enhance the coherence between existing policies and plans to align them with the country's climate change commitments, in line with the Sustainable Development Goals (SDGs).	Urgent	Complex	Low budget
Introduce economic incentives to enhance water source protection and encourage sustainable agricultural practices. Implement a local Payment for Ecosystem Services (PES) mechanism to regulate livestock numbers in accordance with pasture carrying capacities.	Not Urgent	Complex	Low budget
Renew and update the concept of environmental impact assessment. This should include conducting Strategic Environmental Assessments (SEAs) for national policies like Vision 2050. Simultaneously, focus on enhancing the capacity of national Environmental Impact Assessment (EIA) professional companies.	Not Urgent	Complex	High budget

4.2 Implementation

4.2.1 Strengths

The Ministry of Environment and Tourism (MET) is the government body responsible for climate change, oversees coordination of climate change-related activities and projects. This includes addressing interlinkages, avoiding duplications, and ensuring comprehensive efforts in climate adaptation, disaster risk reduction, and natural resources management planning. Coordination within the MET occurs through Ministerial Council meetings, where department heads align their activities. Despite this, there is no specific mechanism for coordinating climate change adaptation activities within the Ministry.

Professional entities and companies are responsible for developing management plans for forests, Special Protected Areas (SPAs), river basins, and biodiversity. The Environmental Impact Assessment (EIA) is crucial in preventing environmental damage. At the Ministry of Environment and Tourism (MET), disaster risk prevention is mainly focused on forest and steppe fires, especially in dry periods, with frequent coordination with the National Emergency Management Agency (NEMA) for fire management.

In 2011, the National Action Programme on Climate Change (NAPCC) appointed the National Climate Committee (NCC) as the governmental authority responsible for addressing climate change issues and implementing the Action Programme. The NCC, led by the then Minister of Environment and Tourism, was tasked with overseeing climate change-related activities, ensuring sectoral integration, evaluating project and programme implementation, and providing guidance and supervision to stakeholders.

To provide scientifically informed advice to the National Climate Committee on climate-related issues and solutions, NCC Professional Councils were established in 2021 by an NCC decision. The composition and Terms of Reference for these councils were also ratified by the same ministerial decision. The Councils shall consist of professionals and experts with knowledge and experience in the field of climate change from government agencies, non-governmental organisations, research institutions, and academia. The council and NCC have no regular functions over the issues related to the policy and guidance on climate change.

Before 2002, the Land Use Agency was under the Ministry of Environment but has since become an independent entity, primarily focusing on land use registration, cadastral surveys, and land use planning at the aimag level and has been functioning under the Ministry of Construction and urban development until recent change of the agency status. However, the Land Use Agency had a limited focus on land restoration activities. In the Ministry of Environment and Tourism (MET), certain responsibilities pertaining to land restoration are linked to tackling desertification issues.

At a Cabinet meeting on October 10, 2021, the Government of Mongolia established the National Committee for Climate Change and Desertification (NCCCD), formalised by Government Decree No. 333 on October 20, 2021. NCCCD is led by the Prime Minister and aims to facilitate inter-sectoral coordination and convenes quarterly to focus on desertification reduction and soil pollution.

Environment and tourism department is the local administrative unit operational in all provinces/ aimags and are staffed with dedicated personnel. River basin administrations have been established for all 29 river basin areas. Rangers operate under the administration of Special Protected Areas and Soum governments. Additionally, voluntary rangers work on a contractual basis in

collaboration with the Ecological Policy Division. Community initiatives such as Pasture User Groups for pasture management, Forest User Groups for forest management, and Community-Based Natural Resource Management Groups have been established to protect natural resources.

In January 2020, a substantial change occurred in the institutional framework with the establishment of the Ecological Police Force by the Government. A department has been set up in the capital city, and efforts are underway to recruit local-level representatives and enhance their capacities.

4.2.2 Gaps and challenges

The lack of strong coordination between national and local stakeholders in climate change initiatives can be traced back to limited government capacity and unclear definitions of roles and responsibilities across various sectors. Often, climate change is viewed as the exclusive responsibility of the Ministry of Environment. This perception leads to a failure in integrating climate adaptation and disaster risk management effectively into sectoral policies and planning.

Currently, regular communication between ministries on Climate Change (CC) issues is lacking. Limited time for intersectoral coordination in daily operations, along with high turnover and low capacity of government staff, hampers these efforts. Additionally, the staff number in the Department of Strategic Planning and Climate Change is inadequate for effective cross-sectoral coordination of climate change adaptation and National Determined Contribution (NDC) goals implementation.

The frequent changes in the government structure have resulted in the imprudent management of vital natural resources, including water and forests. Since 2000, there have been numerous alterations to the agency structures responsible for these resources. The newly established institutions face difficulties in maintaining human resources due to offering low government salaries and challenging working conditions. Additionally, these institutions grapple with the task of creating updated regulatory frameworks for the management of critical resources. This challenge is exacerbated by the high vulnerability of the water sector to the changing climate in the country.

The MET is currently understaffed for desertification issues, with only one staff member dedicated to the task. Desertification is closely related to the increasing livestock numbers, which falls under the Ministry of Food, Agriculture, and Light Industry (MoFALI) in terms of pastureland usage. Efforts to regulate herd sizes through livestock taxation in the Budget law, intended to fund 12 actions, have been ineffective. The tax range (0 to 2500 MNT) fails to motivate herders to reduce herd sizes, despite facing challenges like dzud, drought, and limited palatable species in rangelands.

The Strategic Environmental Assessment (SEA) has not been applied to national-level policies and programmes in Mongolia. Since the adoption of the Law on Development Policy Planning by the Mongolian Parliament, mid-term national policy programmes have been consolidated into seven targeted national programmes, as the result the practical aspects of SEA implementation remain unclear in the new set up of policy documents. The existing Environmental Impact Assessment (EIA) law does not adequately cover provisions for disaster risk prevention. Although it accounts for ecological impacts of economic activities, it falls short in addressing the risks associated with climate change. Additionally, the law contains legislative contradictions.

Although the concept of river basin management (RBM) is relatively recent in Mongolia, plans have been devised for 29 river basin areas. Yet, executing these RBM plans is challenging due to conflicts between different water users and mineral resources exploitation activities in protection zones of the water bodies and the

limited capabilities of administrative personnel. The plans do not provide explicit guidelines for river basin authorities (RBAs) and fail to pinpoint specific vulnerable regions needing focused water sector adaptation. This lack of detail in the plans and lack of coordinated framework/ regulation for land and water use that impedes their successful implementation.

At the provincial level, Forest User Groups (FUGs) are tasked with safeguarding forests against fires and illegal logging. These groups are formed with the aim of gaining support from projects funded by international donors. However, they face a lack of incentives for their protection efforts as well as for deriving benefits from their conservation activities.

Local government staff try to keep up with recent legislative changes due to fair/ clumsy coordination between laws and regulations in the area of disaster risk management and climate change adaptation. This leads to difficulties in policy implementation and dealing with local community and departmental issues. The lack of coordination between central and local governments, along with issues of inter-agency collaboration, exacerbates these challenges, and financial limitations further hinder effective local governance.

Responses to forest fires are often reactive rather than preventive. Despite collaboration between aimag Agriculture departments and Local Emergency Management Agencies (LEMA) in creating 5-10 year action plans, disasters like floods, livestock diseases, droughts, and rodent infestations are increasing.

Soum development plans, especially for infrastructure, economic, and social development, are often based more on public feedback than on scientific research. This approach overlooks the impacts of extreme weather and land use, particularly in pastures and mining areas. While the aimag Land Agency assists soum land managers, their capacity remains limited. To improve soum plans and meet the central Land Agency's requirements for the national land use and administration database, professional certified agencies are being involved.

4.2.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Integrate climate risk and vulnerability assessments into national and local development plans across various sectors, including social, health, and education.	Urgent	Complex	Low budget
Incorporate climate change adaptation aspects into the methodology for developing the River Basin Management Plan (RBMP) and reflection into the Land use plans	Urgent	Easy to implement	Low budget
Strengthen law enforcement and policy implementation in the areas of environment and climate change adaptation by mobilizing resources and uniting the efforts of all stakeholders involved.	Urgent	Complex	Low budget
Enhance climate change and development coordination through close collaboration between the Meteorological and Environmental Department (MET) and the Ministries of Economic Development and Finance.	Urgent	Easy to implement	Low budget
Enhance the roles of rangers and improve the coordination of local Environmental Departments in prevention activities. This should include better collaboration with other sectors such as agriculture, land use, and infrastructure at the local level.	Urgent	Easy to implement	Low budget
Shift focus from policy planning to tangible implementation, especially in strategically mobilising local resources to support vulnerable communities.	Urgent	Easy to implement	Low budget
Assist the Land Use authority in focusing on land rehabilitation efforts by reinforcing the accountability of land users and addressing the root causes of degradation, in close collaboration with the Ministry of Environment and Tourism (MET). Ensure that herder organizations and cooperatives fulfill their obligations, especially when the carrying capacities of pastures are surpassed.	Not Urgent	Complex	Low budget

Recommendations	Urgency	Ease of implementation	Cost
Improve the Water Authority's effectiveness by hiring skilled staff and specialists, and by enhancing its governance structure to ensure alignment and coordination with the land use authority.	Not Urgent	Complex	Low budget

4.3 Financing

4.3.1 Strengths

The MET, especially its Department of Strategic Planning and Climate Change, is responsible for the budgeting and planning of various entities. These include the Hydrometeorological Institute, National Authority for Meteorology and Environmental Monitoring, River Basin Authorities (RBAs), water protection measures, Forest Agency (covering forest management to firefighting), Special Protected Areas administration, whose technical supply and investments mainly from the KfW/CCA and Biodiversity protection projects.

The development of Mongolia's National Adaptation Plan is in progress, funded by the UNEP GCF project. A 2013 Technology Needs Assessment report identified key technologies for mitigation and adaptation efforts. However, while the Ministry of Environment and Tourism (MET) includes specific climate change adaptation activities in its budget, regional, aimag, and soum levels lack planning and budgeting based on risk and vulnerability assessments.

Given the regional variations in natural and climate resources and risk levels, planning and financing systems need to account for these differences. The current legal environment is starting to reflect environmental condition variations in development policy planning and financing. For instance, the 2017 "Methodology for calculating the income transfer from the Unified Community Development Fund and Local Development Fund" allocates budget revenue transfers to aimags and soums based on local development index, population characteristics, and local tax activities, each with a 25% weight. This local development fund planning/ budgeting needs to consider Climate risk indexes.

Under the Law on Natural Resources Use Fee, the government gains additional income that can be allocated for reducing risks associated with natural resources and the environment. The "Nature Conservation Fund" was created through Resolution 188 by the State Great Khural in 1998, as outlined in Article 34 of the Law on Environmental Protection. Its structure and personnel were updated by the Government of Mongolia's Resolution 189 in 2012. Later, during the State Great Khural session on February 9, 2017, this fund was transformed into the "Environment and Climate Fund (ECF)." The management of the fund's revenues and expenditures is governed by the "Government Special Fund Law," specifically under Article 7, section 7.3, and is overseen by the government's budget.

4.3.2 Gaps and challenges

Funding for environmental projects and national initiatives largely relies on annual government budgets, along with international grants. However, the allocation for the Environment and

Climate Change Fund, which supports national environment-focused programmes, has been quite limited. Local authorities can use their own revenue streams for environmental projects, but often their spending falls short of the necessary amounts.

The Integrated Budget Law, effective since the start of 2013, introduced the Local Development Fund (LDF) to assist local governments in improving living standards. Unfortunately, the current support procedures under the LDF do not encompass climate adaptation or disaster risk prevention activities, raising concerns about whether development addresses emerging risks effectively.

At both national and local levels, limited budget availability and competing priorities make it challenging to allocate sufficient funds for risk reduction and climate adaptation. Financial allocation for Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) should not be viewed simply as a fiscal task, but rather as a crucial investment to prevent future losses and damages, which could be more costly.

Presently, financing for Disaster Risk Management (DRM) in the environmental sector is limited to fire prevention and water source protection, along with pollution prevention measures mandated by respective legislations. There is a significant opportunity to extend green financing mechanisms to cover disaster risk prevention and climate change adaptation activities more comprehensively.

4.3.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Update the guidelines governing the Local Development Fund to incorporate the Climate Risk Index (CRI), enabling a more accurate analysis and assessment of climate factors. Make the Climate Risk Index (CRI) and Vulnerability Index (VI) essential components of the Disaster Prevention and Risk Reduction Plan.	Urgent	Complex	Low budget
Coordinate funding sources for climate adaptation and risk management across various sectors, including those funded by natural resource usage payments, mineral resource usage fees, and the local development fund. Ensure the Environment and Climate Change Fund is used in sync with these budget sources, with special focus on addressing the needs of vulnerable and high-risk areas identified through the Climate Risk Index.	Not Urgent	Easy to implement	Low budget
Ensure that all allocations are in line with National Adaptation Planning and National Determined Contributions (NDCs) action plans, essential for meeting international obligations, including those under the Paris Agreement.	Not Urgent	Complex	Low budget
Update the insurance system regulations to incorporate the latest developments in insurance law and address the wellbeing of rural herders. This update should include setting up coverage requirements that are specifically designed to meet the needs of this community. Additionally, public health issues should be examined in relation to climate change, with appropriate policy and preventive actions being taken.	Urgent	Complex	Low budget

4.4 Knowledge, technology and equipment

River basin management plans incorporate the use of the Standardized Precipitation Evapotranspiration Index (SPEI), selected to assess drought and drought conditions. The SPEI index, calculated and monitored over multiple years, provides a measure of the wetness and dryness of each year. It is widely used to evaluate the risk of surface water, lakes, and ponds shrinking and drying up.

A climate change risk assessment was carried out for various sectors including water resources, biodiversity, ecosystem services, forests, agriculture, animal husbandry, arable farming, social health, and infrastructure. This comprehensive assessment followed the multi-criteria analysis methodology of the Department for Environment, Food, and Rural Affairs (DEFRA) in the UK. The UNDP's 2012 report identified pasture animal husbandry, biodiversity in pastures, infrastructure, and arable farming as the most vulnerable sectors.

For projecting future climate change in Mongolia, data from 10 selected General Circulation Models (GCMs) were used, referencing the 1986-2005 climate periods under various Representative Concentration Pathway (RCP) scenarios, including RCP 2.6, RCP 4.5, and RCP 8.5. The focus was on the changes in winter and summer temperatures and precipitation from 2016 to 2100 compared to the 1986-2005 periods.

In historical climate change research, scientists like Baatarbileg N., Jakobi G., and others enhanced Palmer's drought indicator using annual tree ring growth data, exploring the relationship between tree ring growth and the Southern Oscillation. Mijiddorj R. also researched the correlation between tree ring growth indices and river discharge, as documented in his 2012 work. The sector currently lacks legal policy provisions for conducting risk analysis and assessment.

The GCF UNDP project "Improving adaptive capacity and risk management of rural communities" involved mapping vulnerable sites by Jemr Consulting Company using various methods and data sources. Key techniques included:

- **Climate change model results:** Utilising a 30 km x 30 km grid and remote sensing data from MODIS, Landsat, and the SRTM elevation model.
- **Geographic information and thematic maps:** Incorporating diverse thematic maps covering aspects like land use, water bodies, and fire-prone areas.
- **Statistical information:** Including population data, animal headcounts, and forest inventories.
- Data processing involved GIS tools like QGIS and ArcGIS, along with ENVI for digital treatment. The project employed a mix of methodologies for study, analysis, assessment, and ranking, drawing from frameworks like UNFCCC, IPCC, and IUCN.

In the risk and vulnerability assessment for project sites within four target aimags, spatial data was combined with various indicators to rank locations based on their climate conditions and suitability for adaptation measures. Air temperature and precipitation were analyzed using a 30km x 30km grid climate model. Additionally, data like land surface temperature, evapotranspiration, and vegetation, derived from MODIS data of the TERRA satellite, were used, offering a high resolution of 1km x 1km NDVI. This analysis, covering data from May-August 2000 to 2021, included detailed studies of spatial differences, chronological changes, and deviations. Satellite data from the Aqua and Terra MODIS sensors, covering the entire territory of Mongolia, were also downloaded and processed into a continuous time series. Using multi-analytical methods, 68 soums across the four aimags were selected for adaptation, with spatial data processing and mapping conducted using GIS software, in particular, is noted for its wide application in climate change adaptation, supporting various file

formats and integrating with multiple programming languages and web services.

NEMA has collaborated with the GCF UNDP project to develop methods for estimating losses and assessing needs due to disasters like dzud, forest and steppe fires, flooding, and strong winds. This partnership focuses on improving understanding and response to these disasters.

Additionally, MET has introduced a methodology to evaluate ecological damage caused by illegal human activities. This approach, while distinct from disaster-related assessments, addresses environmental losses from harmful practices affecting forests, water resources, biodiversity, and land, offering a holistic view of both natural and human-induced environmental impacts.

4.4.1 Strength

Since the 1980s, the hydrometeorological service has been conducting annual national grassland monitoring in the middle of August using the line-point method. This method, ideal for dry grasslands, assesses parameters like plant species composition, distance between perennial plants, and yield per hectare. Over 1,500 monitoring points, representing diverse grassland ecosystems, are used for this purpose.

This monitoring is crucial for various applications. It contributes to national reports, assesses climate change impacts on grasslands, helps develop desertification maps, calculates pasture carrying capacity, and aids in creating dzud risk maps. The data is vital for pasture management, assessing pasture condition, recovery capacity, and degradation level. This involves comparing with fresher pastures using a state and transitional model based on the ecological potential of the area.

Beyond pasture monitoring, hydrometeorological services also perform soil monitoring every five years at these grassland points, further contributing to comprehensive environmental assessments.

The UNDP GCF project includes an initiative to incorporate climate risk and vulnerability considerations into land use planning methodologies. This effort specifically targets the development plans of soum territories and river basin management plans in four aimags, covering 14 river basin areas. The objective is to improve the resilience and sustainability of these regions by integrating climate factors into their planning processes.

4.4.2 Gaps and challenges

The integration of climate risk and vulnerability assessments into the land use plan development methodology is facing challenges due to the institutional capacity constraints and uncooperative nature of government institutions. ALaMGaC staff lacks the necessary capacity and human resources to conduct comprehensive climate risk and vulnerability assessments at the landscape level, particularly utilizing advanced techniques such as climate modeling and ecosystem assessment. As a result, the approval of the methodology by the Land agency was difficult.

NAMEM is moving from traditional weather forecasting methods to impact-based forecasting, a change that is expected to improve the use of weather forecasts and climate predictions moving from an existing approach in disseminating the weather forecast. This new approach incorporates socio-economic baseline data, allowing for a more precise assessment of vulnerability and exposure risks. Furthermore, by implementing forecast-based planning and financing strategies derived from impact-based forecasts, NAMEM aims to proactively improve effectiveness of the climate

services and reduce potential disaster risks and losses before they occur.

ALaMGaC's efforts in monitoring pasture state and quality are notable, involving photo-monitoring at over 6,000 points for pasture use adjustment, database creation, and information dissemination. They also conduct five-yearly pasture certifications through professional organizations, assessing conditions and changes. However, challenges exist in coordination and resource allocation.

To improve efficiency, ALaMGaC encouraged local branches to collaborate in monitoring, but differences in methods and goals, especially between meteorological staff and land officers, have limited effectiveness. The time-consuming nature of meteorological methods contrasts with the more efficient photo-taking by land officers.

Given the extensive demands of monitoring over 6,000 points and limited fieldwork funding, ALaMGaC is exploring the adoption of remote sensing methods. Yet, accessing suitable technology for this purpose is challenging.

Further, there's a need to increase the number of monitoring points for water, climate, and environmental factors. However, funding limitations hinder this expansion. Resolving these funding issues could allow for more monitoring points, especially in areas with significant ecological changes or overlapping zones. Overcoming these challenges and securing additional funding are essential for enhancing the effectiveness of pasture monitoring and overall ecological management.

4.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Develop data exchange protocols, including GIS data formats, to facilitate the sharing of environmental and climate data among institutions, particularly for land use and river basin management planning. Set clear and defined requirements and procedures to effectively implement risk-informed, climate-resilient development practices.	Urgent	Complex	Low budget
Enhance decision-makers' and local populations' understanding of the significance of climate adaptation science in the country. Increase awareness among decision-makers at national and local levels about climate change adaptation and available solutions. Encourage the adoption of ecosystem-based approaches in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA).	Not Urgent	Easy to implement	Low budget
Create climate services tailored to specific sectors, such as agriculture and protected areas, to better meet their unique needs.	Not Urgent	Complex	High budget
Address sector-specific preparedness requirements in weather forecasting, ensure public access to information, and improve the reliability of environmental data.	Urgent	Complex	Low budget
Incorporate data on expected changes in land cover and land use into future climate change projections for Mongolia. This step is crucial for enhancing the accuracy of risk assessments.	Urgent	Complex	High budget

Photo: UNDP/Mongolia

5. PRODUCTIVE SECTORS - AGRICULTURE

The Mongolian agricultural sector plays a pivotal role in several critical aspects, including ensuring food security, enhancing living standards in rural areas, generating employment opportunities, and supplying raw materials to the light industry, all of which contribute to the diversification of the economy. This sector can be classified into four distinct production systems or subsectors:

1. *Extensive livestock production system:* This system embodies the traditional semi-nomadic pastoral lifestyle, where horses, camels, cattle/yaks, sheep, and goats coexist and graze together throughout the year on vast pasturelands;

2. *Mechanized large-area crop production system:* This system emphasizes the cultivation of cereals and fodder crops on large agricultural plots using mechanized farming techniques;

3. *Potato and vegetable production:* This category is dedicated to growing potatoes and other vegetables, utilizing both mechanized and simple production methods, and is mostly engaged by family farmers;

4. *Peri-urban intensive livestock production system:* This system encompasses dairy cattle, pigs, and poultry.

In addition, there are also minor supplementary subsectors in beekeeping and reindeer husbandry that play a role in Mongolia's agricultural landscape. Each of these production systems contributes significantly to the multifaceted role of the agricultural sector in the country's economy.

In the past, Mongolia's economy was predominantly driven by the agricultural sector, with a strong focus on the livestock subsector. The sector played a vital role, contributing 30% to 40% of the country's GDP until the late 1990s. Notably, extensive livestock production has served as the cornerstone of Mongolian agriculture, underpinning its economy and cultural heritage for generations. The five livestock species have evolved over centuries, shaped by traditional knowledge, herding techniques, and the forces of natural selection, further enhanced through selective breeding. For centuries, Mongolians and their livestock have maintained a symbiotic relationship on the vast steppe. Despite its seemingly desolate appearance, the steppe is a crucial source of pasture for over 70 million livestock, marking the highest recorded number in the country's history as of 2022. A significant 80% of the rural population still relies on livestock for their livelihoods, and about 30% of the country's total households own livestock.

However, a significant transformation began in the early 2000s with the discovery of substantial coal deposits and gold-copper ore reserves. These abundant mineral resources, coupled with the growth of mining-sector activities, have reshaped Mongolia's economic landscape. Presently, the principal sectors contributing to GDP include mining, agriculture, and services, with notable growth driven by the export of commodities such as gold, copper, coal, and cashmere.

The figure 15 describes changes in Mongolia's GDP from 1990 to now across agriculture, mining, manufacturing, and construction sectors. Post-1990, a shift to a market economy led to changes in these sectors. In 1990, manufacturing was

crucial which included the processing of food and agricultural products, held a pivotal position in the country's total domestic product and labour force, contributing 21.3% to GDP, but has since declined to about 9%. Meanwhile, mining rose to 23.3%, and agriculture contributed 12.6%.

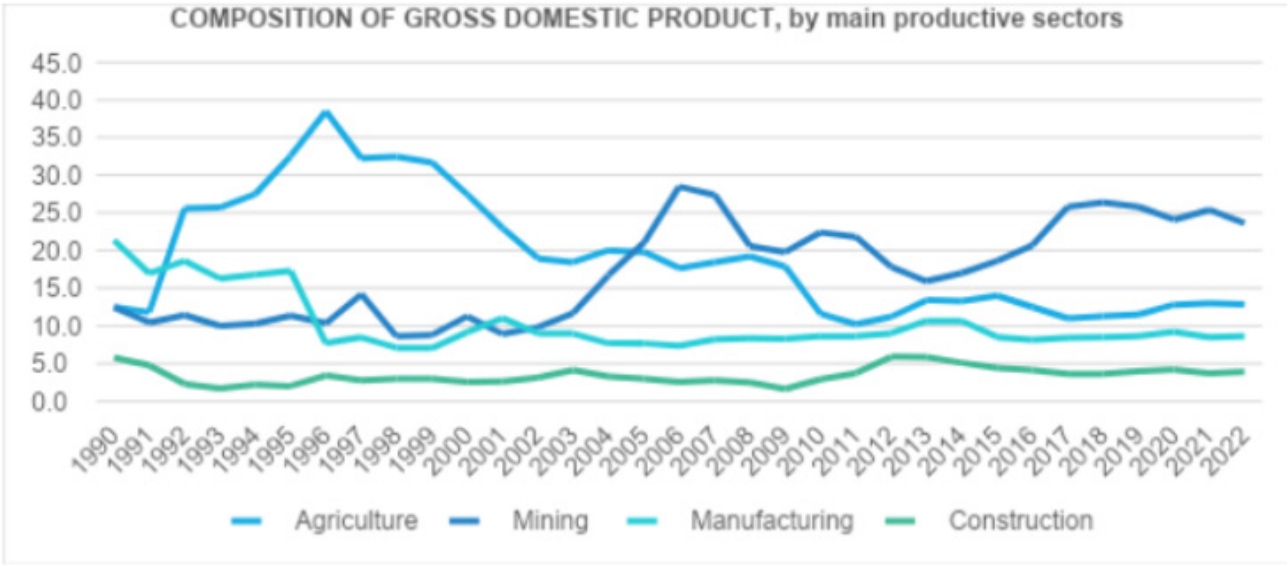

Figure 15. Composition of gross domestic product by main productive sectors
Source: NSO, www.1212.mn

As of 2022, Mongolia's agricultural sector accounts for 12.8% of the national GDP. However, concerning trends have emerged in the GDP statistics for industrial sectors in 2022. The agricultural sector has been pushed to the third position, trailing behind the dominant forces of mining and wholesale and retail trade. This shift highlights a worrisome reliance on non-renewable extractive resources and the import-driven trade of goods, underscoring the absence of a robust domestic manufacturing sector.

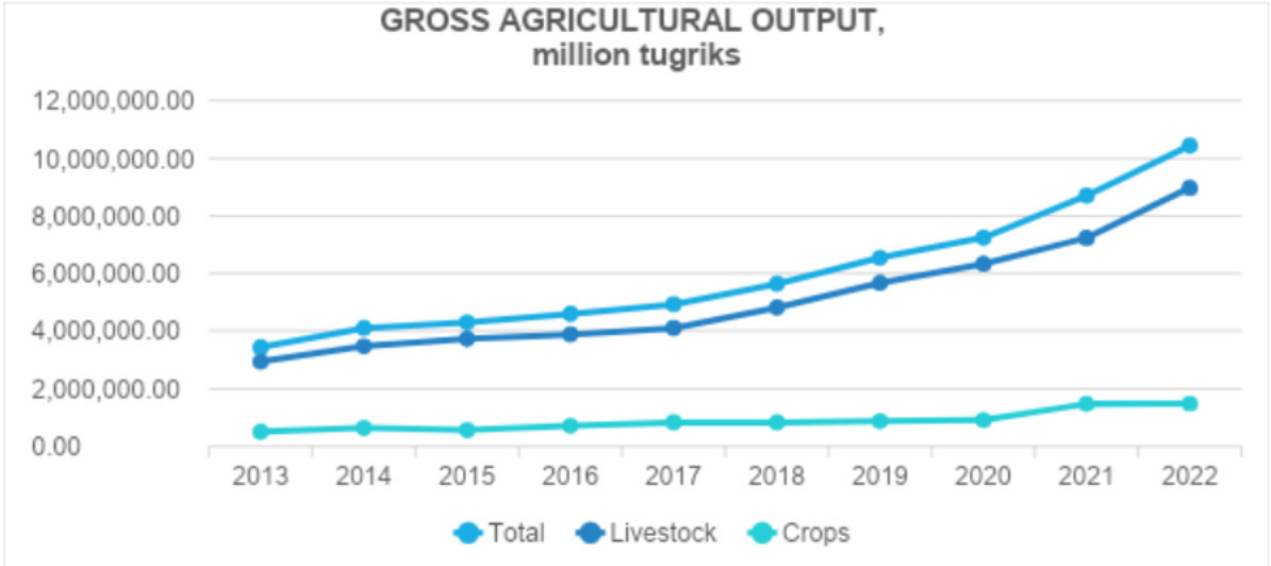

Figure 16. Gross Agricultural Output
Source: NSO, www.1212.mn

According to national statistics in 2022, official employment in the agriculture sector was reported as 24.99%, that is share within Mongolia's economy.

In 2022, 26% of the total households in the country, equivalent to 248.3 thousand households, owned livestock, with 190.8 thousand of these being dedicated herder households. Over the past decade, the number of herder households has experienced significant growth, increasing by 45.5 thousand. In the crop sector, there were 17.7 thousand households and 1.6 thousand enterprises engaged in crop activities.

The crop sector in Mongolia, starting over 60 years ago, focuses on wheat, potatoes, vegetables, and animal feed cereals like barley, rye, and oats. According to the World Bank, crop production growth in the last decade has cut wheat, potato, and flour imports by 78%, 95%, and 96%, respectively, and fodder production surged by 250%. However, in 2022, crop land decreased by 56.5 thousand hectares (8.4%) to 618.6 thousand hectares compared to 2021.

Table 2. TOTAL HARVEST, by type, in thousand tonnes

Crops	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Wheat	465.3	368.5	488.3	203.9	467.1	231.4	436.1	411.4	406.1	566.3	401.9
Potatoes	245.9	191.6	161.5	163.8	165.3	121.8	168.9	192.2	244.3	182.6	214.0
Vegetables	98.9	101.8	104.8	72.3	94.4	82.1	100.7	99.5	121.2	121.7	148.9
Fodder crops	46.2	42.6	44.3	49.2	53.4	47.9	123.8	121.1	182.1	293.7	171.2

Source: NSO, www.1212.mn

Mongolia, the world's most sparsely populated and largest landlocked country with 3.4 million people, possesses a remarkable livestock sector. Despite its ability to meet domestic meat demand, the country has seen limited meat exports over the past three decades. This is attributed to the continuous increase in livestock numbers, primarily due to newborns, which has driven the livestock population to nearly three times the carrying capacity of pasture.

Over the last century, Mongolia has witnessed a 5.2-fold increase in livestock numbers, with a 1.6-fold increase in the past decade. The main livestock species raised in Mongolia are horses, bacterian camel, cattle, sheep and goats, often referred to as the "five livestock" (tavan khoshuu mal). Trend for the livestock numbers are presented on the graph below.

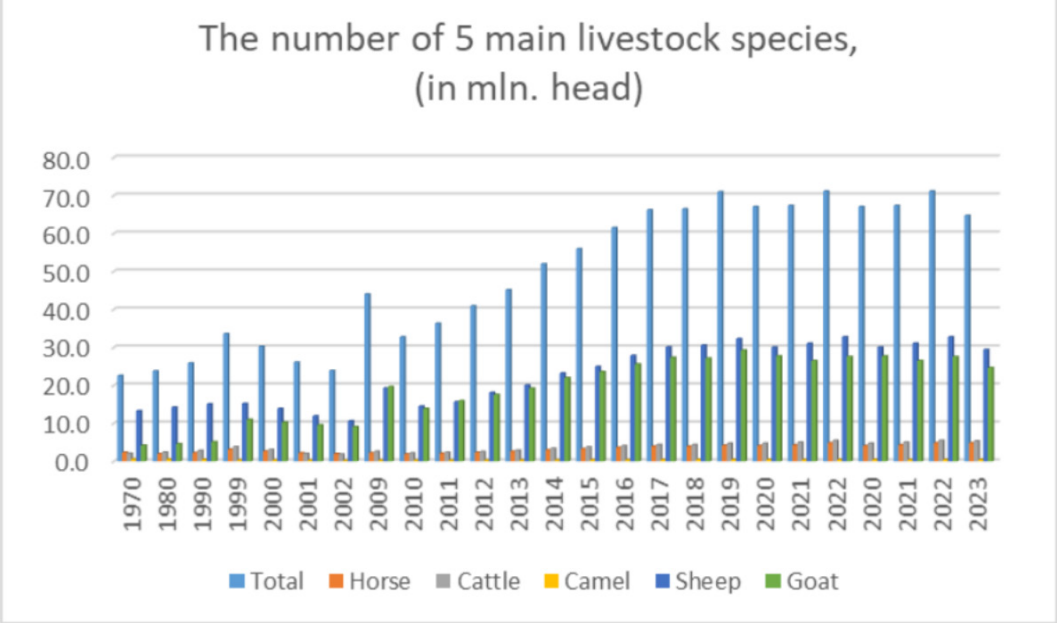

Figure 17. Number of 5 main livestock species (in mln. head)

The foundation of agricultural production is primarily based on the availability and utilization of land and natural resources. Mongolia's vast and diverse landscapes, including pasturelands, arable land, and access to natural resources like water, are essential components that support its agricultural sector. According to the statistics, agricultural land in Mongolia spans 113.6 million hectares, encompassing a substantial 72.6% of the country's total territory.

Table 3. Agricultural area, million hectares

Type	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Change over 10 years
Total agricultural land	115.36	115.08	115.00	114.93	114.84	114.81	114.74	114.04	113.98	113.57	-1.79
Pastures	111.03	110.65	110.61	110.49	110.43	110.39	110.33	109.65	109.58	109.15	-1.87
Haymaking fields	1.71	1.72	1.72	1.74	1.71	1.71	1.71	1.71	1.71	1.71	0.00
Arable land	0.99	1.01	1.03	1.07	1.09	1.10	1.12	1.13	1.13	1.14	-0.15
Abandoned crop land	0.31	0.31	0.31	0.26	0.24	0.23	0.22	0.21	0.21	0.22	0.09
Land for agricultural buildings and structures	0.071	0.077	0.074	0.111	0.117	0.116	0.104	0.088	0.089	0.091	-0.02
Land unsuitable for Agriculture	1.260	1.260	1.260	1.260	1.260	1.260	1.260	1.261	1.260	1.260	-

Source: NSO, www.1212.mn and consolidated reports of the Integrated Land Classification Database for 2020 and 2022

Within this vast expanse of agricultural land, pastureland dominates and constitutes a significant 96.1% of the total agricultural land. Notably, pastureland is being repurposed for urban and industrial development, as well as for the mining sector. This trend is illustrated by the conversion of land from pastoral to non-pastoral use: 130.0 million ha in 1945, 122.1 million in 1964, 122.7 million ha in 1989, 111.3 million ha in 2009, and 109.1 million ha in 2022. In the past decade alone, pastureland decreased by 1.9 million ha, even as the livestock population grew by 57.5%.

Comparing the condition of rangelands in 2017 to the monitoring results in 2022, it's evident that the rate of degradation is on the rise each year.[24]

Table 4. Percentage of grassland degradation categories

Degradation level	2017	2018	2019	2020	2021	2022
I-Non degraded	30.0%	19.0%	17.0%	11.5%	13.5%	12.4%
II-Slightly degraded	54.0%	38.0%	35.0%	46.6%	45.6%	52.3%
III-Moderately degraded	12.0%	19.0%	22.0%	19.6%	19.3%	15.8%
IV-Heavily degraded	4.0%	20.0%	21.0%	16.6%	14.9%	14.8%
V-Fully degraded	0.0%	4.0%	5.0%	5.7%	6.7%	5.1%

Source: The 2022 consolidated reports of the Integrated Land Classification Database

With regard to cropland, the Soil and Agrochemical Laboratory at the Institute of Plant and Agricultural Sciences of Mongolia identified serious soil erosion uniformly spread over the entire cropland area. 61.4% of cropland is subjected to severe erosion, 34.9% is moderate, and 3.7% is slightly eroded.[25][1] The soil humus content in eastern agricultural soils is medium and/or lower medium at 1.8-2.1%. Similarly, soil nitrogen supply is universally moderate or low, while agricultural soil in most areas is crucially deficient in plant nutrients (Mongolian Crop Production System, 2019). The two-field rotation with fallow-grain, fallow-potato scheme, which is widely used in the Mongolian crop production system, also leads to accelerated loss of soil fertility. Excessive use of chemical fertilizers and pesticides, the degradation of crop fields and the decline in fertility are contributing to converting the cultivated land into disturbed steppes. This has led to fragmented utilization of farmland, soil deterioration, and loss of soil fertility and fallowing of farmlands. As of 2015, about 120,000 hectares of cropland are deemed to be degraded (NRSO 2015).

As a consequence of anthropogenic climate change, Mongolia has experienced a surge in the frequency, intensity, unpredictability, and magnitude of climate and weather extremes. The table below illustrates the main types of hazards that pose a risk to agricultural production:

Table 5. Main types of hazards that pose a risk to agricultural production

Livestock	Crop
Drought	Drought
Dzud	Frost
Flooding	Flooding
Dust /Sand/Snow Storms	Hail
Wildfires/Forest-Steppe fires	Storms
Transboundary animal diseases (TADs)	Plant pests and diseases

Mongolia's livestock system, dependent on grasslands, is highly vulnerable to climate risks and dzuds—a phenomenon causing severe winters that block access to pastures. After dry summers, animals lack fat reserves, and fodder shortages, due to high costs and scarcity, exacerbate this. Many impoverished herders lose their livestock, face destitution, and migrate to cities, often falling into a cycle of poverty and social issues. This situation is illustrated in graphs 1 and 2.)[26].

Between 1999 and 2002, Mongolia faced three consecutive dzuds, causing 25% of its national herd to die. These dzuds, coupled with extreme droughts, led to over 12,000 herding households losing all their assets, pushing many below the poverty line. The 2009-2010 dzud was particularly devastating, with 10.3 million livestock deaths (25% of the national stock) affecting 28% of Mongolia's population. The Red Cross reported that 220,000 herding households were impacted, 44,000 losing all livestock and 164,000 losing over half. This 2010 dzud resulted in a 2% GDP loss in agricultural output[27]. Dzud has also been linked to increased infant mortality rates.[28]

According to the Third National Communication[29] (2018), the frequency of dzud has been increasing since the 1990s and is projected to rise by 5–20% under the RCP 4.5 scenario by 2080.

The Ministry of Food, Agriculture and Light Industry reported that between 2010 and 2021, the National Meteorological Service observed 1,472 severe winter conditions, as indicated by the accompanying graph. This data highlights that Zavkhan and Uvs provinces are particularly prone to dzuds.

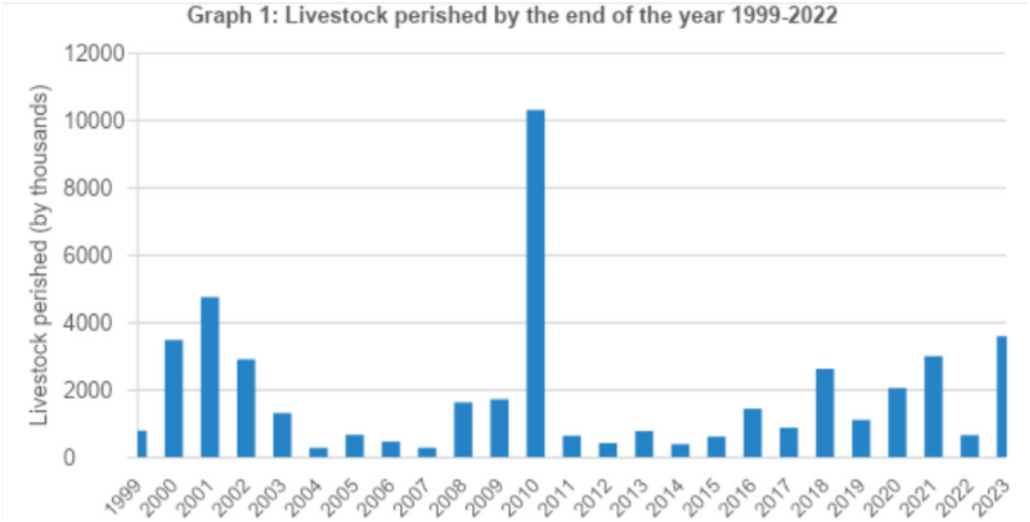

Figure 18. Livestock perished by the end of the year 1999 - 2022

Source: National Statistics office of Mongolia: www.1212.mn

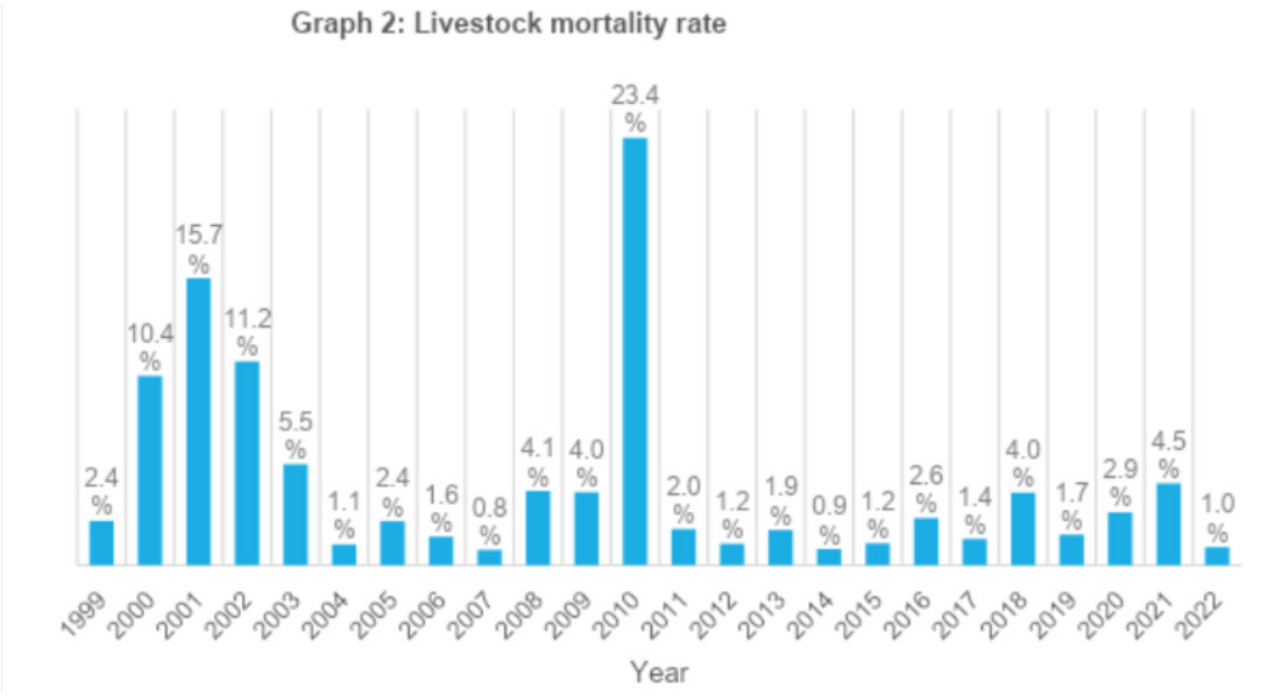

Figure 19. Livestock mortality rate

Source: National Statistics office of Mongolia: www.1212.mn

According to data from the National Statistical Office (NSO), the damage of on average 4200 natural disasters reached an annual mean of 95 billion MNT between 2009 and 2019 (28.4 million euros). In that decade, around 2,008 forest and field fires consumed approximately 28 million hectares (MSIS, 2020). Changing climatic conditions in Mongolia would further aggravate the harsh conditions that already exist. While increasing temperature trends may appear beneficial for Mongolian vegetable production, the more frequent weather extremes associated with global warming can lead to production uncertainty and yield defaults.

Furthermore, these climatic risks are aggravated by production risks which are caused by underdeveloped supply chains. An especially significant challenge is the underdevelopment of the local seed production. Seed materials are usually imported from China and Russia. It should be stated, however, that imports from China are not adapted to local climatic conditions (Pöschk, 2016).

A study conducted by the Plant Protection Institute in 2019 reveals that Mongolia is home to over 700 species of harmful insects that are widespread in pastures, fields, and forests. These harmful insects have a significant impact on agricultural productivity, causing reductions in crop yields by 2-10%, potatoes and vegetables by 13-30%, and hay and pasture by 19-40%.

The 2021 study conducted by FAO, which assessed the resilience capacity of Mongolian herder households using the Resilience Index Measurement and Analysis (RIMA) tool, yielded important findings. The analysis covered more than 10,000 herder households across all 330 administrative districts in 21 provinces, including the peri-capital 6 districts of the country. The results indicated an average resilience level of 40.45 among these households.

However, the analysis also highlighted concerning disparities in resilience levels. A significant portion of the population, approximately 57%, exhibited below-average resilience capacities. On the other hand, only 10% of the population demonstrated high resilience, with a Resilience Capacity Index (RCI) exceeding 70. Alarmingly, over 20% of households struggled with scores lower than 20.

5.1 Governance

5.1.1 Strengths

The existing framework governing land use, improvement, and pasture protection will undergo enhancements, and an integrated pasture management system will be established. Specific limits for the number, type, and composition of livestock will be defined in harmony with natural ecology and grazing capacity. Strategies will be implemented to effectively manage animal and plant diseases, grazing rodents, and insects, all while augmenting livestock pasture, hay, fodder, and water supply to reduce the risks associated with animal husbandry.

Provisions concerning DRR/CCA in the Food and Agriculture sector are well incorporated into the country's mid and long-term development strategies, policies, action plans, as well as sectoral policy and planning documents, including draft documents.

Given the agricultural sector's high susceptibility to climate change, its elevated vulnerability to natural disasters, and its near-total reliance on natural and climatic factors, this integration takes on paramount significance. Within the framework of the "Vision-2050" long-term development policy, Mongolia has set an ambitious goal: to establish agriculture as the driving force of the economy, characterized by its commitment to environmental sustainability and adaptability to climate change. This vision encompasses the nurturing of agricultural resilience, alignment with societal development trends, and customization to meet the needs and demands of society. The overarching aim is to create a responsible, highly productive, and sustainable agricultural sector.

Early warning and assessment methodologies for dzud risk, along with clearly defined institutional responsibilities, as well as the provision of emergency hay and fodder reserves at both the national and provincial levels, are well-established. Additionally, response measures, including

anticipatory actions, have been effectively implemented.

A One-Health approach, encompassing a multi-sectoral national action plan on Antimicrobial Resistance (AMR), strategies for controlling Transboundary Animal Diseases (TADs), and institutional strategies for veterinary services, is in place. It is worth mentioning that Gender strategy has been developed for the agriculture sector.

5.1.2 Gaps and challenges

While policy documents acknowledge the interconnection between DRR and sustainable development, there is a considerable gap in elucidating how this understanding will be practically applied. This deficiency impedes the seamless integration of DRR into sustainable development strategies and policy documents in the agriculture sector.

While there is a notable focus on dzud preparedness, there is very limited governance framework, including planning, stockpiling of resources, and readiness for other types of natural disasters that can affect the agricultural sector. The support to the local level should be provided via strengthening of the extension services.

The sector's policies and objectives emphasize further development, but they lack clear provisions or specific goals aimed at enhancing the resilience of vulnerable populations and identifying the individuals included within this group.

While it is commendable that state policies exist to enhance economic stability by aligning livestock numbers with grazing capacity, some measures aimed at reducing disaster risk contradict these policies. A notable example is the annual expenditure of state and local budgets on drilling deep wells to augment water supply to pastures, which further depletes natural resources and hayfields, contributing to land degradation. To mitigate this risk and enhance the resilience of herder communities, it is essential to support community-based sustainable and responsible development. This involves implementing a clear breeding plan to improve per-animal productivity and adding value to all by-products, including manure and leather, ultimately reducing the overall number of animals.

According to the existing procedures, the government, by becoming a party to global and international accords, pledges to honour its commitments. However, the actual execution of these commitments often lacks effectiveness. The creation of policies and decisions without the involvement of local communities' results in weak implementation and oversight of both sectoral development and disaster risk reduction initiatives. This approach also impedes the achievement of national goals related to global sustainable development and climate change. The gap between declared objectives and existing practices highlights the necessity for inclusive governance and active participation from the community to successfully tackle the prevailing challenges.

The current legal frameworks regarding national and local councils and commissions for disaster risk reduction and emergency management are confined to roles for government institutions and civil servants. This structure significantly lacks involvement from representatives of local herder and farmer communities, as well as from non-governmental organizations (NGOs) that represent their interests. It is important to enhance the government's ability to meet urgent challenges in a way that is consistent with its international commitments.

5.1.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Integrate agriculture extension services to support the rural population effectively.	Urgent	Complex	Low budget
Foster active engagement and commitment from relevant sectors, including Agriculture, Emergency Management, Environment, and Social and Applied Sciences, to enhance coherent planning in agriculture.	Urgent	Easy to implement	Low budget
Prioritize inclusive governance by actively involving local communities in creating policies and decisions regarding sectoral development and disaster risk reduction.	Urgent	Easy to implement	Low budget

5.2 Implementation

5.2.1 Strengths

The Ministry of Food, Agriculture, and Light Industry is a key player in addressing the risk and preparations, in accordance with the functions outlined in the Mongolian Disaster Protection Law. The State Disaster Protection Department (Service), which operates under the Ministry of Food, Agriculture, and Light Industry (MoFALI), serves as the national focal point for disaster protection. The Minister for Food, Agriculture and Light Industry, who heads the State Service, represents sector-specific matters in the State Emergency Commission, the National DRR Council, and also holds a position as a member of the National CCA Council.

In addition to the statutory responsibilities, the State Service leads the humanitarian food security and agriculture sector with FAO to ensure that sector members are aware of relevant policy guidelines and technical standards related to food security and agriculture emergencies and that their responses are in line with the humanitarian standards and guidelines.

Since 2017, Mongolia has taken a pioneering role in Anticipatory Action, contributing to the global development of this innovative approach. Mongolia's commitment to rigorous experimentation and learning has been instrumental in shaping the vision and implementation of Anticipatory Action. This approach has been instrumental in disaster risk management.

Roles and responsibilities in Dzud risk assessment and early action have been clearly defined. Mongolia has invested significant resources, with support from organizations like FAO and the Mongolian Red Cross Society (MRCS), in cultivating a comprehensive Anticipatory Action system. This system has facilitated a range of anticipatory actions and responses based on the dzud risk map warnings.

To concretize these long-term development aspirations stipulated in the framework of the "Vision-2050", a comprehensive set of specific objectives have been delineated for medium and short-term action plans, programmes, and activities within the livestock and crop sub-sectors. These objectives prioritize enhancing the agricultural sector's adaptability to changing conditions of production and climate while minimizing associated risks. Additionally, there is a significant focus on strengthening the agricultural insurance system to mitigate economic losses and uncertainties arising from unforeseen risks.

5.2.2 Gaps and challenges

DRR falls under the jurisdiction of the Emergency Management Authority mainly NEMA, while CCA is the responsibility of the Ministry of Environment and Tourism. This division of responsibilities presents challenges in integrating and harmonizing DRR and CCA efforts within the agricultural sector, potentially hindering the coordinated approach needed to address climate-related risks and vulnerabilities effectively. Effective disaster risk reduction and climate change adaptation in agriculture necessitate collaboration across various sectors, including agriculture, environment, health, and finance. The current lack of strong cross-sectoral coordination leads to fragmented efforts and operational inefficiencies. Coordination among different sectors and projects/programmes for planning, implementation, and monitoring (involving NEMA, SS, Ministries, and provincial departments) is curr

Although there is a basic disaster protection plan at the aimag and soum levels, it falls short in several areas. One significant deficiency is the lack of a regularly updated contingency plan covering disasters other than dzud. Additionally, these plans do not adequately incorporate input from local communities. Beyond the local reserves for hay and fodder, there's an absence of a specific budget allocated for Disaster Risk Reduction (DRR) and preparedness for a range of natural disasters. In emergency situations, there's an over-reliance on the reserve fund controlled by the soum governor, aimag, and national government, which is not ideal for responding to various disaster types. Locally, there are ongoing difficulties in maintaining and expanding the effective practices that have been established through donor-funded projects.

Notably, the least resilient herder households were characterized by limited assets, education, and access to basic services. These vulnerabilities place them at risk of inadequate winter preparation, making them more susceptible to the loss of livestock due to a single shock event. This, in turn, could potentially push these households deeper into poverty, emphasizing the need for targeted interventions to enhance their resilience and overall well-being.

There is a shared understanding among line ministries and provincial governments that NEMA is responsible for conducting disaster preparedness capacity-building activities.

There are no sector-specific contingency plans or a clearly defined risk management framework for addressing floods, dust and snow storms, and wildfires. A DRR plan specific to the crop sub-sector is not yet in place.

There is no established mechanism for identifying beneficiaries according to vulnerability criteria in the event of disasters. Monitoring and evaluation are not conducted based on a clear set of indicators, and there is a lack of impact-based monitoring.

5.2.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Support the establishment of storage facilities, such as those for fodder and hay, and processing facilities at the local level to strengthen the resilience of local communities.	Urgent	Easy to implement	High budget
Develop clear indicators to effectively monitor the implementation and impact of DRR initiatives in agriculture.	Urgent	Easy to implement	Low budget
Concentrate capacity building efforts on the Humanitarian Standards Partnership (HSP), with a special focus on institutionalizing the Livestock Emergency Guidelines and Standards (LEGS) to protect livestock-based livelihoods. Emphasize Good Emergency Management Practices (GEMP) as a guide for preparing for animal health emergencies and ensure adherence to Sphere standards.	Urgent	Easy to implement	Low budget
Coordinate and maintain stock reserves at levels sufficient to match the projected level of risk.	Urgent	Easy to implement	Low budget

5.3 Financing

5.3.1 Strengths

According to the recently conducted review of Public Expenditure for Food, Agriculture, and Light Industry during the 2011-2020 period as part of the UN joint programme 'SDG-Aligned Budgeting to Transform Employment in Mongolia,' implemented collaboratively by UNDP, FAO, ILO, the Government, and civil society organizations, with the exception of the year 2011, the budget allocation for the Ministry of Food, Agriculture, and Light Industry has consistently ranged from 0.2% to 1.6% of the GDP, 0.8% to 4.2% of the general budget, and 1.1% to 5.5% percent of the state budget over the past decade. The exceptional deviation in 2011 can be attributed to a significant increase in the Ministry's budget, primarily driven by expenditures of 176.8 billion MNT allocated for concessional loans provided to small and medium-sized enterprises, in addition to an allocation of 130.0 billion MNT for enterprises engaged in cashmere production.

As summarized, the overall size and composition of the budget for this sector have evolved over the past decade, primarily influenced by factors such as subsidies, current transfers, and repayments deducted from net credit.

The total subsidies and discounted loan interest provided by the state budget to the food, agriculture, and light industrial sectors constitute

34.1% of the overall budget expenditures and net loans. Moreover, it accounts for 46.9% of average current expenditures during the period from 2010 to 2020, highlighting its substantial contribution to the sectoral budget.

On average, over the last 5 years, budget expenditures for the food, agricultural, and light industry sectors were allocated as follows:

- 19.5% for the development of livestock farming.
- 10.6% for the development of crop farming.
- 2.8% for the development of food production.
- 11.1% for the development of light industry.
- 24.0% for the sub-programme of preventive measures in veterinary.
- 6.1% for livestock, crop, and light industry management policies.
- A mere 0.1% for research in livestock, crop, and light industry.

When analysing the budget expenditures by purpose category in the sectors for 2021, it's noteworthy that 41.4% of the approved budget is allocated for subsidies and incentives to support agricultural production. Additionally, a significant portion, amounting to 32.7%, is designated for various veterinary services, diagnostics, and surveillance.

Mongolia's evidence-based approach has demonstrated that Anticipatory Action is not only cost-effective but also upholds the dignity of those affected by disaster risks. For every dollar invested, families can receive a return of more than 7 $, thus averting livelihood losses and providing multiple benefits.

5.3.2 Gaps and challenges

Implementing crucial measures, such as preventing transboundary animal diseases, managing water resources, promoting sustainable agricultural development, enhancing resilience, and adopting new technologies, demands substantial financial resources. The existing funding deficit poses a significant threat to the success of these vital initiatives.

The limited participation of local communities, especially herders and farmers, in the planning, monitoring, and assessment of disaster response efforts has led to a poor comprehension of disaster risks and methods to improve their resilience. This limited awareness of the risks associated with disasters contributes to their hesitation in considering possible risk transfer or insurance options.

Additionally, disaster insurance companies do not actively engage in training and promotional campaigns to emphasize the significance of insuring against these risks to the herders. One insurance product commonly known among herders is index-based livestock insurance (IBLI). However, because this type of insurance sets loss thresholds that may not be ideal, it is seldom chosen by them. Those who do opt for it often seem to do so primarily to meet the criteria for securing a bank loan or to qualify as a prominent herder in the state, their aimag, or soum.

A legal provision exists for establishing local hay and fodder emergency reserves funded by livestock taxes. Unfortunately, the provision allowing herders to be exempt from this tax if emergencies occurred hinders tax collection, rendering implementation impractical. Furthermore, the land use fee law remains in effect, including a provision for transferring payments to the sheep head unit. Unfortunately, this provision is abolished but not officially, and a new tax in the form of livestock number tax has been introduced, causing confusion in the taxation system.

The stagnation in production can be attributed to vulnerabilities that farmers face when it comes to production risks, which often hinder investments. The Mongolian vegetable sector encounters

natural development challenges due to unfavorable climatic conditions. Like other countries in the region, Mongolia is exposed to various natural risks that can significantly impact farming activities. The Asian Disaster Reduction Centre identifies droughts, earthquakes, epidemics, famine, floods, forest fires, wind damage, and snow damage (dzud) as major disasters in Mongolia (ADRC, 2020).

Balancing the livestock population with the carrying capacity of the pastures is crucial to address overgrazing and pasture degradation, which is considered a primary factor intensifying the impact of climate change and increasing the frequency of natural hazards. To achieve this balance, there is an urgent need to boost meat exports. The challenge arises from the coexistence of 3.4 million people with over 70 million livestock, leading to a rapid saturation of the domestic meat market and consumption. Despite substantial untapped export potential, it is of utmost importance to invest significant efforts, resources, and capital in promoting animal health and establishing herds and regions with a healthy status. Therefore, a substantial portion, specifically 32.7%, of the budget expenditures of the line ministry is earmarked and utilized to enhance veterinary services, diagnostics, and surveillance.

Owing to a limited understanding of disaster risks, rural communities often lack the necessary resources to effectively protect themselves and their livelihoods. Consequently, when disasters occur, they frequently struggle to regain control, leading to substantial damage and highlighting their limited coping strategies and resilience

5.3.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Establish a national Catastrophic Risk Pool (CRP) and consider joining a global CRP to improve financial resilience against disasters.	Not Urgent	Easy to implement	High budget
Review and implement best practices in weather-based crop insurance schemes for more effective coverage.	Urgent	Easy to implement	Low budget
Raise awareness among herders and farmers about the benefits of risk insurance, aiding in more informed decision-making.	Not Urgent	Easy to implement	Low budget
Revise the Law on Land Use Fees to accurately account for the environmental impact of livestock on pastures, ensuring fair and sustainable usage.	Urgent	Complex	Low budget
Improve the Livestock Insurance policy to more effectively meet the specific needs and challenges faced by herders.	Urgent	Complex	Low budget
Develop microinsurance schemes specifically designed for crop and vegetable farmers, offering them targeted financial protection.	Urgent	Easy to implement	Low budget

5.4 Knowledge, technologies and equipment

5.4.1 Strengths

The NAMEM, with its annual dzud risk map, has played a pivotal role in Anticipatory Action. These risk maps, crafted by integrating remote sensing data and ground observations, consider a wide range of parameters. This robust early warning system has facilitated Anticipatory Action activations. The Food and Agriculture sectoral database and monitoring system for livestock and plant diseases are continuously being improved.

Mongolian Animal Health Information System (MAHIS) was developed in 2016 and implemented nationwide in 2019, plays a vital role in ensuring public food safety and animal health. Its continued expansion with the addition of approximately 40 modules and the adoption of an Early Warning and Response (EWAR) system for clinical signs of Transboundary Animal Diseases showcases its resilience and adaptability.

Plant Tracing and Agrochemical Registration System was developed with support from FAO and the Swiss Agency for Development and Cooperation, this system has enabled government subsidies for potato, vegetable, and fruit farmers

for the first time in 2022. It enhances traceability and safety in the agricultural sector.

Moreover, advanced irrigation techniques and low-water consumption technologies will be introduced in the cultivation areas of grains, potatoes, vegetables, fruits, and fodder. A collaborative effort involving both the government and the private sector will be initiated to safeguard soil against wind and water erosion, damage, and livestock grazing. This includes implementing measures such as fencing agricultural fields and establishing forest strips. Pesticide testing and residue examination in crops, coupled with the establishment of quality control laboratories in agricultural areas, will play a pivotal role. Robust plant protection and quarantine measures will also be implemented, encompassing comprehensive plant protection practices in cultivation areas and continuous research and monitoring of the spread of plant diseases, weeds, harmful insects, and rodents. The development and implementation of control measures will be carried out on a regular basis. These multifaceted approaches collectively aim to enhance the agricultural sector's resilience and sustainability while effectively addressing the evolving challenges posed by climate change and disaster risks.

Mongolia's dedication to innovation, data-driven approaches, and comprehensive systems underscores its strengths in disaster risk management and agriculture. These strengths are pivotal in building resilience, ensuring food safety, and promoting the dignity of those facing disaster risks.

5.4.2 Gaps and challenges

The sector's approach to policy development, centered on risk assessment, has notable weaknesses. This inadequacy hampers the effective management of evolving risks and vulnerabilities. Additionally, there is a significant shortfall in the workforce, particularly in terms of professionals skilled in disaster risk reduction and climate change adaptation, affecting both the Ministry and other involved agencies. Responsibility distribution is also a challenge, with the National Emergency Management Agency (NEMA) bearing the sole responsibility for public awareness in disaster risk reduction. This leaves a gap, especially in rural areas, as the role of other state services like the State Disaster Protection Service of Food and Agriculture is not clearly defined, even though there are specific targets for disaster risk reduction training in educational settings.

Furthermore, the crop sub-sector faces challenges with data management. Losses are not systematically reported, and information on natural and chemical hazards is not fully integrated. The environmental and pasture degradation caused by livestock is also not adequately accounted for. Lastly, there is an urgent need for evidence and science-based planning, particularly in climate finance applications, where there is a noticeable lack of research.

5.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Facilitate the transfer of climate-smart technologies and share best practices through Public-Private Partnerships to enhance agri-food systems.	Not Urgent	Easy to implement	Low budget
Initiate continuous Research and Development in critical sectors to foster ongoing innovation.	Urgent	Complex	High budget
Expand public education on Disaster Risk Reduction/Management and Climate Change Adaptation in agriculture to strengthen community resilience.	Urgent	Easy to implement	High budget
Establish measurable indicators for tracking the impacts of disasters and the effectiveness of response strategies.	Urgent	Easy to implement	Low budget

Photo: UNICEF/Mongolia

6. PRODUCTIVE SECTOR - INFRASTRUCTURE

Mongolia's development in infrastructure is significantly influenced by its unique geographic location, vast territory, socio-economic factors, and low population density. The assessment of the infrastructure during the capacity diagnosis process focused on several key areas, including:

- Infrastructure for Schools and hospitals (structural readiness aspect).
- Infrastructure for flood control, with a focus on the Ulaanbaatar area due to time constraints and team expertise.
- Energy infrastructure.

Schools and hospitals

Schools and hospitals not only provide essential services during non-crisis time but also serve as the places for evacuation and emergency medical service points in the aftermath of disasters. This section provides the analyses of structural readiness of schools and hospitals in the context of seismic risk in Ulaanbaatar.

Energy infrastructure

Despite significant renewable energy potential, Mongolia relies heavily on coal-fired power plants for 93% of its electricity, most built between 1960-1980. Coal is also the main heating source, leading to substantial greenhouse gas emissions and severe air pollution, especially in Ulaanbaatar, surpassing pollution levels in cities like Beijing and New Delhi. This has escalated into a public health crisis, particularly affecting children. Despite these issues, coal usage continues due to rising domestic demand for electricity and heating. With peak electricity demand nearing current generation capacity, Mongolia has resorted to costly power imports from Russia, complicating its energy security and socio-economic situation.

Mongolia's electric power system includes four independent grids: the Central Energy System (main grid supplying over 90% of national electricity), the Eastern, Western, and Altai-Uliastai Energy Systems, plus an isolated CHP system in the South Gobi region. Covering a large area with a sparse population, these grids primarily serve major cities and industrial regions. Currently, 329 soums and 326 settlements have grid access, achieving a 98% electricity access rate. Five districts are powered by renewable energy. As of June 2015, Mongolia's total installed capacity is estimated at 1,082 MW according to the Energy Sector Development Policy 2015-2030.

The industry recognizes that its assets and facilities are at risk from both natural and human-induced disasters, including fire, floods, strong winds, dust and snowstorms, thunder and lightning, earthquakes, and landslides. The cascading effects of energy system failure due to such disasters are detailed in Figure 9 from a Disaster Risk Assessment report by Dat Consulting company, illustrating the extensive socio-economic impacts of energy system breakdowns.

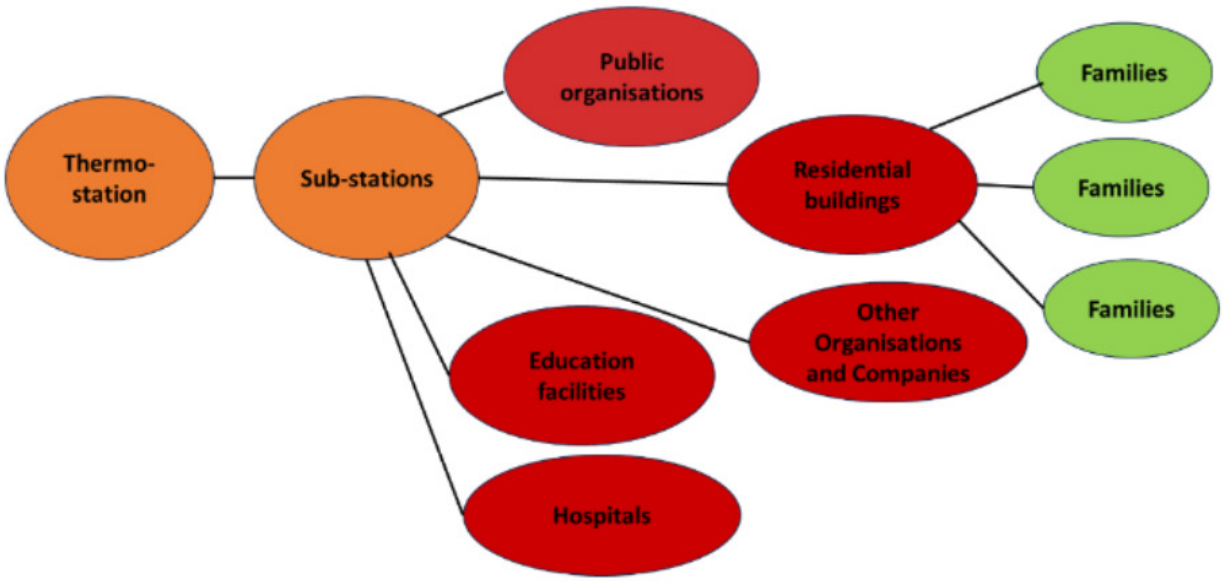

Figure 20. Multiplier impacts of the energy system failure

Despite the vulnerability of its assets and facilities to disasters, the energy sector in Mongolia lacked official records on sector-specific disaster incidents and their impacts. This changed in 2023 when the Ministry of Energy conducted its first sector-specific disaster risk assessment. This initiative followed the establishment of a Sector Inspection department within the ministry, utilizing a government-approved checklist.

Prior to this, several small-scale disaster risk assessments (DRAs) were carried out on demand for individual sector companies. Notably, one of the most comprehensive DRAs was conducted in 2021 for the Western energy system by Dat Consulting Company, under the guidance of the National Emergency Management Agency (NEMA). These risk assessments focused on various disasters, including fires, heavy winds, snow and dust storms, earthquakes, and non-compliance with norms, standards, and technology.

6.1 Governance

6.1.1 Strengths

Flood control infrastructure

Flood control structures are critical infrastructure whose primary purpose is to mitigate flood risk. Under today's legal and regulatory provisions in Mongolia, local governments (province, city, soum, and district) are given full authority to design, construct, and maintain flood control infrastructure in their territories, in conjunction with overall city or land development and natural resources management. Below summarizes the key legal framework that governs flood control infrastructure implementation.

- **Law on Disaster Protection (2017)** specifies that public and local administrative organization, legal bodies shall undertake structural and non-structural disaster risk reduction measures. Structural measures entail physical assets such as facilities, objects, roads, and bridges. Flood is identified as one

of the hazardous events against which risk reduction measures must be implemented. The law gives the Governors of province (aimag), capital, soum, district full powers to plan, fund, manage, implement and monitor measures for disaster protection in their territories

- **Law on Water (2012)** governs overall water resources management with some consideration of flood protection. It empowers province, capital city, soum, district citizen's representative khural to discuss and approve plans and programmes for water resources management, including prevention of water disasters. It also empowers aimag and capital city governors to decide and implement the budget for water resources management, including flood hazard and construction of "water facilities (this entails flood control)" It empowers the State administrative central organization in charge of nature and environment to develop and approve methodological guidelines for land management plan.

- **Law on Urban Construction (2016)** defines engineered infrastructure/facilities including roads, railway, suspension roads, roads above or underground, all types of utilities, ordinary or engineering structures to prevent disasters and accidents; which indicates flood control structures. Aimag or capital city governor has the full power to issue construction work permits.

- **Law on Land (2002)** entails a clause on the possibility of termination of the land possession contract in the case that the land is deemed to be no longer suitable for the original purpose of use due to natural hazards or disasters. The governors of soums and districts has the power to undertake eviction if the land is not vacated within a specified period.

Urban Development Law (2008) has a provision of restricting urban development activities in the areas prone to hazardous events.

Over the past years, there have been multiple layers of efforts to develop a long-term plan for flood management in Ulaanbaatar. Ulaanbaatar City General Plan and Urban development Program Study (2009, JICA) and Flood Risk Assessment and Flood Risk Management Strategy for Ulaanbaatar City (2015, World Bank) contributed to the formulation of today's Ulaanbaatar General Development Plan 2040 and the City Engineering of Preparatory Measures Master Plan (2023, Ulaanbaatar City Geodesy and Hydraulic Agency). Those two documents guide the long-term technical investment for flood management measures, including flood control infrastructure in Ulaanbaatar city.

Schools and hospitals

Ministry of Education and Science (MOES) is responsible for new and existing school infrastructure. As for hospital buildings, the **Ministry of Health (MOH)** is responsible for healthcare infrastructure from planning, designing, maintenance and management, as per the Law on Health and the Law on Public Health. The regulatory standards are set by the Construction Development Center under the Ministry of Construction and Urban Development. Mongolia adopted Russian Design Code (SNIP) in the 1950s but over time, building codes evolved and improved by integrating seismic consideration1. Recently, seismic building codes were upgraded to MSK 8-92 for schools, kindergarten, and hospitals. Besides the three key government entities (MOES, MOE, and Construction Development Centre), multiple other national and local government agencies are involved in the lifespan of school and hospital buildings. Below is an example for school building.

- Planning: Ulaanbaatar city Department of Education and Urban Planning Department

- Design: Ulaanbaatar city Department of Education, Construction Development Center, Local government Land Administration, NEMA (for fire)
- Construction: City investment Department (procurement), Construction Development Center (supervision), national review commission (occupancy certificate)
- Operation and Maintenance: MOES, Construction Development Center, and Inspection Agency

As part of the National Disaster Risk Reduction Council, the Standing Committee for Earthquake Disaster Prevention was established in 2014 (Resolution 118). The Committee which involves MOES and MOH, was specially established to promote a broader earthquake risk reduction in Mongolia.

Guided by Mongolia Vision 2050, education sector and health sector specific investments through Education Sector Mid-Term Development Plan 2021-2030 and Health Sector Strategic Plan 2022-2025, respectively.

Energy infrastructure

The Energy Law serves as the primary legal framework for the energy sector, although it and its supplementary bylaws don't explicitly address Disaster Risk Management (DRM) and Climate Change Adaptation (CCA). Yet, several clauses indirectly support DRM and CCA by assigning duties to the national government, the Ministry of Energy, specialized inspectors, and consumers regarding emergency reserves, funding, equipment, and monitoring system capacities. Key provisions that refer to DRR include:

- The national government, under the Energy Law, is tasked with creating and financing safety energy resources (as defined in section 3.1.28) to mitigate emergency and force majeure losses and ensure energy production and utilization safety (5.1.4.).
- The Ministry of Energy's responsibilities encompass approving regulations for energy supply in natural disasters and unexpected events (6.1.4.), setting rules for the main network and supply of gas and central heating, and establishing safety procedures for energy facilities and equipment (6.1.5.).
- Customers must adhere to all technical operation and safety regulations (30.1.3.) and are accountable for the upkeep and certification of their power lines, networks, and equipment (30.1.8.).
- Specialized Inspectors have the authority to revoke service provider licenses for reasons like potential health risks (32.1.1.), non-compliance with operational and safety standards (32.1.2.), and poor energy quality (32.1.3.). They can also suspend services in cases of natural disasters, fuel shortages, or safety hazards (32.2.5.), and for technical requirement breaches (32.3.2.).

6.1.2 Gaps and challenges

Flood control infrastructure

Flood control infrastructure requires a systematic approach from upstream to downstream to be effective, and it requires cross-administrative boundaries coordination with dedicated financial resources over time. The current legal and institutional set up has a limited scope of allowing such systematic flood management, while giving full responsibility to the local governments to undertake flood control works as part of the urban planning and water resources management.

Schools and hospitals

There is existing knowledge of seismic vulnerability of school and hospital buildings, which suggests significant damages to school and hospital buildings and their ability to continue providing services after earthquake disasters. However, current sector strategies are mostly focused on enhancement of service provision and have limited to no focus on disaster risk reduction.

Energy infrastructure

There is a significant lack of alignment between the Disaster Protection Plans (DPP) of energy organizations and those of national and local governments, the National Emergency Management Agency (NEMA), Local Emergency Management Agencies (LEMA), and other relevant bodies. This misalignment can result in uncoordinated and ineffective disaster response and recovery efforts. Without a unified approach, each entity may operate independently, leading to duplicated efforts or gaps in the response, thereby exacerbating the challenges during and after disaster situations.

Existing DPPs of organizations within the energy sector are often not comprehensive. They notably lack detailed strategies for the self-preparedness of the organization and its staff for various disaster scenarios. This shortfall means that in the event of a disaster, there may be insufficient guidelines for immediate response, putting both the infrastructure and personnel at greater risk.

A primary issue is the ambiguity in defining roles and responsibilities of staff members in the organizations within the energy sector in disaster risk management. This lack of clear delineation can lead to confusion and inefficiency, especially during crises, as staff may be uncertain about their specific duties and protocols.

6.1.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Flood control infrastructure			
Strengthen the Law on Water by incorporating elements of water management and control specifically for flood management: • Enhance the legislation to establish an institutional framework that elevates the responsibilities for flood protection works. • Mobilize additional manpower and financial resources at the national level, with a focus on implementing basin-wide holistic flood management strategies.	Urgent	Easy to implement	Low budget
Schools and hospitals			
Prioritize the reinforcement of buildings in Ulaanbaatar as the key disaster risk reduction measure in the education sector's plans, given the city's high earthquake risk. • Reactivate the Standing Committee for Earthquake Disaster Prevention, established under the Disaster Risk Reduction (DRR) Council in 2014. • Evaluate the progress of the "27 measures" it initially proposed. • Reprioritise actions based on the most current earthquake risk scenarios, with special attention to schools and hospitals.	Urgent	Easy to implement	Low budget
Energy infrastructure			
Improve Coordination for Disaster Risk Reduction (DRR) and Climate Adaptation (CA): The sector should enhance coordination and communication with the National Emergency Management Agency (NEMA), Local Emergency Management Agencies (LEMA), and other relevant ministries and organizations.			

Recommendations	Urgency	Ease of implementation	Cost
Energy infrastructure			
Improve Coordination for Disaster Risk Reduction (DRR) and Climate Adaptation (CA): The sector should enhance coordination and communication with the National Emergency Management Agency (NEMA), Local Emergency Management Agencies (LEMA), and other relevant ministries and organizations.	Urgent	Easy to implement	Low budget
Introduce mandatory DRR and CA Annual Action Planning, as a tool for risk assessment and mobilization of funds.	Urgent	Easy to implement	Low budget
Strengthen technical capacity at the sector level in DRR and Climate Change Adaptation (CCA) related skills and knowledge, to better prepare for and respond to disasters.	Urgent	Easy to implement	Low budget
Mainstream Disaster Risk Management/ Reduction (DRM/R) and CCA in all development plans and policies, to ensure a sustainable and resilient approach to infrastructure and community development.	Urgent	Complex	Low budget
Renew respective standards and norms based on current research, studies, and disaster and climate risk assessments to reflect evolving challenges and best practices.	Urgent	Complex	High budget

6.2 Implementation

6.2.1 Strengths/existing capacity

Flood control infrastructure

Ulaanbaatar city has the Geodesy and Water Construction Agency, which is mandated to design, install, and manage flood control infrastructure. The office has two departments and five offices across Ulaanbaatar area with 139 staff (9 executive officer, field administration 17, and 133 engineers) to carry out technical functions mentioned above. Regardless of limited staffing, the agency has necessary technical capacity to undertake flood risk analysis, develop technical preparatory measures, and to carry out engineering works for flood protection and control.

Schools and hospitals

Mongolia has a sufficient level of engineering standards and technologies, including that for building vulnerability assessment and retrofitting. More than 100 technical officers at the Ministry of Construction and Urban Development have been trained in seismic building vulnerability assessments. Between 2016 and 2019, a total of 199 public buildings including schools and hospitals were assessed. As of September 2023, two schools, one kindergarten, two hospitals are considered for retrofitting, of which three buildings are considered for the development of a blueprint.

Energy infrastructure

The energy sector's approach to disaster risk reduction (DRR) is robust and multi-faceted, shaped by its historical roots in the country's civil defense during the socialist period. This background has equipped the sector with a skilled operative team, an emergency supply system, and support equipment, enabling it to effectively assist other sectors during and after disasters.

The Ministry of Energy (MoE) forms the basis of energy policy, strategy, and planning, oversees a broad range of activities from power generation and grid development to district heating. The MoE's policies encompass both coal- and renewable-based power generation, focusing on the development, conservation, and utilization of these energy resources, as well as the import and export of coal. The ministry also greenlights investment plans for electricity transmission and distribution developments. The Sector Inspection department was established in 2023, and undertook a significant initiative, conducting the first-ever risk assessment of sector organizations. This assessment was guided by criteria approved by the Government, marking a milestone in the MoE's approach to risk management. The department for Sector Inspection is not just a one-time participant in risk assessment but is actively involved in ongoing monitoring and evaluation of sector facilities. It regularly assesses these facilities against the government-approved risk criteria.

Research initiatives also play a significant role, with a dedicated research institute under the MoE contributing to disaster management and risk reduction research activities. System maintenance is a regular and crucial practice in the sector, particularly in summer months to mitigate operational failure risks and enhance system safety and security. This maintenance is crucial for expanding capacity to handle increasing demands, especially in winter. Moreover, the sector's commitment to risk assessment and mitigation is evident in its recent collaboration with the National Emergency Management Agency (NEMA) for fire risk assessment, a proactive measure that ensures preparedness and resilience in the face of potential disasters.

6.2.2 Gaps and challenges

Flood control infrastructure

A large part of the Geodesy and Water Construction Agency's work is on regular maintenance of the existing flood prevention infrastructure. 60% of the city's drainage systems were constructed between 1966 and 1987 and requires appropriate maintenance and strengthening, including that with the consideration of seismic risk projected in the Ulaanbaatar area. Clearing of drainage after every heavy rain/flood is also part of the maintenance

which requires manpower and financial resources, which is currently insufficient.

Energy infrastructure

The energy sector, while making progress in disaster risk management, faces significant challenges that need addressing to enhance its resilience and preparedness. A notable gap is the lack of human resources for emergency teams. This shortfall means that when a disaster strikes, there may not be enough skilled personnel to effectively manage and respond to the crisis, potentially leading to delayed or inadequate responses that could exacerbate the situation.

Another critical issue is the limited technical capacity of government officials in matters related to disaster risk reduction and climate change adaptation. This limitation hinders the development and implementation of effective strategies and policies. Government officials play a pivotal role in shaping and executing disaster risk management plans.

There is a critical lack for resource allocation for technical upgrading of the entire system as all system and grid networks have been aged and deteriorated.

Furthermore, there is a noticeable lack of resource allocation for research activities related to disaster risk management, reduction, and climate change adaptation. Research is crucial for understanding the evolving nature of disaster risks and the impacts of climate change. Without sufficient investment in this area, the sector may find itself ill-equipped to adapt to changing circumstances, innovate in disaster management strategies, or effectively implement new technologies and practices that could mitigate these risks.

Development and maintenance plans in the sector do not always consider disaster risk information, leading to potential vulnerabilities. Sector facilities, including electric pillars and steam and hot water pipes, pose safety risks to third parties. The use of land in buffer zones around electrical lines and pipes aggravates fire and safety risks, particularly in urban areas and cultivated lands, and limits the operation and maintenance of electrical facilities.

6.2.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Flood control infrastructure			
Boost the implementation capacity for flood prevention infrastructure by incrementally enhancing human resources, both in quality and quantity. In conjunction with the financial investment planning for the long-term flood management master plan, design a human resources investment plan spanning at least 3 to 5 years.	Urgent	Easy to implement	Low budget
Energy infrastructure			
Develop a comprehensive disaster preparedness plan that encompasses measures for all related disasters, including preparedness part and measures that are feasible for the implementation.	Urgent	Easy to implement	Low budget
Implement fire safety guidelines for everyday activities to enhance preparedness and compliance.	Not Urgent	Easy to implement	Low budget
Regularly renew and upgrade electrical grid components to reduce risk and vulnerability.	Not Urgent	Easy to implement	High budget
Undertake mapping and inventory of critical infrastructure and facilities within the sector, prioritizing their safety during diverse disasters.v	Urgent	Complex	Low budget
Enhance coordination with respective organizations for an effective early warning system, information dissemination, and communication system access.	Urgent	Complex	High budget
Review and strengthen the risk assessment criteria set by the Government, focusing on disaster risk reduction (DRR) and climate change adaptation (CCA).	Urgent	Easy to implement	Low budget
Initiate DRM/R and CCA training programs for sector personnel, including those in government and private sectors, tailored to all relevant disasters.	Not Urgent	Easy to implement	Low budget

6.3 Financing

6.3.1 Strengths/existing capacity

Flood control infrastructure

Since 2017, Ulaanbaatar city has been expanding flood management activities through the union budget. Annually, 4-5 billion tugrik (1.2 - 1.4 million USD) has been invested every year to implement installation and maintenance of culvert, drainage line, and flood channels.

Energy infrastructure

Financial resources for the disaster-related activities in the Energy sector are allocated according to the Disaster Protection Law, underscoring a legal framework that prioritizes disaster risk reduction (DRR) and climate change adaptation (CCA). This focus is also reflected in the country's policy documents, where DRR and CCA are highlighted as priority areas. Furthermore, the availability of international funds for DRR, CCA, and the introduction of green technologies presents additional financial support opportunities. Additionally, the regular budget of sector organizations in Mongolia can be allocated for disaster risk assessment to a certain extent, providing a stable financial base for ongoing risk management activities.

6.3.2 Gaps and challenges

Flood control infrastructure

While long-term flood management plans exist (Ulaanbaatar General Development Plan 2040 and the City Engineering of Preparatory Measures Master Plan), they do not come with a solid investment plan. The city's flood control infrastructure work does not receive sufficient financial resources to carry out all the necessary engineering works. On average, about 10% of the required budget is received for implementation.

Schools and hospitals

There are still a significant number of schools and hospitals in Ulaanbaatar that are understood to be structurally vulnerable. However, there seems to be a lack of urgency to address the issue.

According to the school safety assessment[30], significant majority of schools lack allocated budgets for disaster risk reduction (88%) and for maintaining educational continuity during emergencies (80%). Currently, there are no established criteria for prioritizing which schools should undergo renovation, with considerations such as construction year, current condition, and hazard risks not being systematically assessed. Additionally, implementing structural retrofitting measures in schools is unfeasible under the existing guidelines and resources.

Energy infrastructure

The current financial resources allocated are insufficient to enhance the sector's resilience, highlighting the need for annual budget integration aimed at system improvement. Additionally, the existing insurance scheme falls short of covering all potential consequences of emergencies. The gap between the sector's historical support role and its current internal vulnerabilities underscores the urgent need for focused improvement in disaster preparedness and risk management.

6.3.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Flood control infrastructure			
Plan financial investments for flood protection infrastructure on a medium-term (five-year) basis: • Complement regular fiscal allocations with other financial tools and resources, given the limited fiscal space.	Not Urgent	Easy to implement	Low budget
Consider establishing sustainable bonds specifically for financing larger-scale flood control infrastructure: • Utilize the existing Green Financing mechanism for additional funding opportunities.	Not Urgent	Complex	Low budget
Incentivize private entity contributions by enforcing a 1.5% budget allocation as directed by the Law on Disaster Prevention	Urgent	Easy to implement	Low budget
Explore external financing options for climate adaptation, including the Green Climate Fund (GCF), leveraging the accredited financial companies and international agencies in Mongolia.	Urgent	Easy to implement	Low budget
Schools and hospitals			
Implement structural risk reduction programs in the education and health sectors using current engineering standards and technologies, including compliance to the existing and improved standards for accessibility.[31]	Urgent	Easy to implement	Low budget
Set aside a portion of the annual budget for these programs, utilizing the 1.0% mandatory DRR budget allocation as stipulated by the Law on Disaster Prevention.	Urgent	Easy to implement	Low budget
Develop a medium-term risk reduction investment plan by the ministries, specifically targeting school and hospital retrofitting.	Urgent	Complex	High budget

Recommendations	Urgency	Ease of implementation	Cost
Set aside a portion of the annual budget for these programs, utilizing the 1.0% mandatory DRR budget allocation as stipulated by the Law on Disaster Protection.	Urgent	Easy to implement	Low budget
Develop a medium-term risk reduction investment plan by the ministries, specifically targeting school and hospital retrofitting.	Urgent	Complex	High budget
Allocate resources for research and development to innovate and improve engineering solutions and standards for structural risk reduction.	Not Urgent	Complex	High budget
Energy infrastructure			
Apply an insurance system specifically for disaster management for the energy sector.	Urgent	Easy to implement	High budget
Ensure regular budget allocations for disaster risk management/reduction (DRM/R) and climate change adaptation (CCA) activities	Urgent	Complex	High budget
Allocate a consistent and regular budget for research and development in DRM/R and CCA.	Urgent	Complex	High budget

6.4 Knowledge and technology

6.4.1 Strengths

Flood control infrastructure

The knowledge of flood risk is available based on the historical flood information and exposure data (i.e., buildings), visualized through spatial analysis/ modelling tools to inform policy and plans. The City Engineering of Preparatory Measures Master Plan (2023) presents a risk model based on the 100-year return period flood. The existing analysis also identifies the structurally vulnerable flood protection infrastructure including the locations of flood protection channels and the dams around Tuul, Uliashi, Selbe, and Dund river that are considered as old and require upgrading or maintenance.

Schools and hospitals

There is already some level of risk knowledge for earthquake risk for schools and hospitals available. There are at least two earthquake scenarios developed for the region around Ulaanbaatar through a project by JICA in 2013. One is Based on Hustai Fault (maximum expected magnitude Mw 7.5) and the other as an integrated scenario for Emeelt fault (maximum expected magnitude Mw 7.0) and Gunjiin Fault (maximum expected magnitude Mw 6.6).

Based on the above earthquake scenario, a structural diagnosis of public buildings including schools and hospitals in Ulaanbaatar city was conducted. It is known that, of 199 public buildings assessed, 185 buildings require some level of seismic reinforcement[32].The data on school and hospital buildings are managed by MOSE and MOH but at the same time, available through the central government data repository, Geo-portal, which has been put in place by the Department of Geodesy and Cartography under the Ministry of Construction and Urban Development.

Energy infrastructure

The energy sector in Mongolia exhibits significant strengths in existing knowledge and technologies for disaster risk management (DRM). NEMA has developed comprehensive guidelines for disaster risk assessments, widely utilized in the energy sector for various hazards like fire, windstorms, earthquakes, and flooding. These guidelines are accessible on the NEMA website and have been effectively implemented through state procurement systems by licensed private companies, specialized companies apply GIS and remote sensing for accurate assessments.

Regular preparedness is integral to the sector's operations, ensuring a high level of readiness and well-equipped facilities. This includes backup and recovery plans for operational failures, with designated technology-equipped locations in Ulaanbaatar ready to serve as backups during electricity network failures. The central electrical system is noted for its reliability and advanced technology, featuring automated systems that activate in emergencies. Furthermore, the sector is equipped with automated fire extinguishers and fire brigades for prompt response to fires in power plants, underscoring a comprehensive approach to disaster risk management.

6.4.2 Gaps and challenges

Flood control infrastructure

While existing flood risk knowledge and technologies are sufficient to inform flood protection infrastructure solutions, current risk modelling seems to have limited consideration of the vulnerability of specific neighbourhoods, such as peri-urban Ger communities and informal settlements.

Schools and hospitals

Today, risk assessments specific to school and hospital buildings are limited to the one conducted through Japan International Cooperation Agency (JICA). While the Law on Disaster Protection mandates every public administrative entity to conduct regular disaster risk assessment, earthquake risk assessment for schools and hospital buildings is not undertaken on a regular basis. Recently, a 50km-long active fault line was found in the Ulaanbaatar area, (Ulaanbaatar Fault, UBF) which is estimated to cause earthquakes greater than M76. The UBF earthquake scenario poses a new challenge to the Ulaanbaatar area, yet there has not been any risk assessment conducted.

Energy infrastructure

The energy sector in Mongolia faces several challenges in disaster risk management. Regular mapping and risk assessment of critical infrastructures are not practiced consistently, leading to occasional and incomplete evaluations. There's a notable lack of comprehensive knowledge and experience in disaster risk management, reduction, and climate change adaptation. Additionally, the sector lacks a systematic approach to collecting and storing data on losses and damages, and there's no specific identification of vulnerable spots for various disasters.

Training for staff in disaster preparedness is limited to fire, flood, and earthquake scenarios, neglecting broader aspects of disaster risk management. Compounding these issues, Mongolia's reliance on aged coal-fired thermal power plants, mostly built between 1960 and 1980, poses a risk. These plants lack necessary reinforcements against natural disasters like earthquakes, strong winds, snow, and dust storms. For example, a heavy rain in 2023 resulted in the collapse of 20 electricity pillars. Critical facilities are not equipped with earthquake sensors, and the common practice of installing electrical substations in building basements presents a significant flooding risk.

Standards and norms from the socialist period, which are still in use, often fail to meet current needs. There is a lack of focused research and study to assess and update these standards and norms. Disaster risk reduction in the sector, including the preparedness of personnel and the safety of office buildings, power plants, and other operational facilities, receives limited attention.

6.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Flood control infrastructure			
Strengthen flood risk assessments by incorporating the socio-economic vulnerabilities of exposed populations or neighbourhoods: • Apply these assessments in cost-benefit analyses to prioritize interventions in flood protection infrastructure.	Not Urgent	Easy to implement	Low budget
Broaden the scope beyond traditional engineering solutions to include green technology: • Make nature-based solutions an integral part of flood protection and control measures. • Leverage these approaches to access diverse financing mechanisms, including Mongolia's national green financing mechanism, the Green Climate Fund (GCF), and the Global Environment Facility (GEF)	Not Urgent	Complex	High budget
Schools and hospitals			
Conduct building structural risk assessments for all schools and hospital buildings in Ulaanbaatar, based on the latest earthquake scenarios: • Utilize the available technical knowledge, human resources, and data for these assessments.	Urgent	Complex	High budget
Prioritize and roll out seismic assessments on a larger scale within sector strategies and plans.	Not Urgent	Complex	Low budget
Energy infrastructure			
Develop and initiate disaster risk management/ reduction (DRM/R) and climate change adaptation (CCA) training programs for personnel across government and private sectors.	Urgent	Easy to implement	Low budget

Recommendations	Urgency	Ease of implementation	Cost
Advocate for academic institutions to include dedicated chapters or subjects on DRM/R and CCA relevant to Mongolia in their curricula.	Urgent	Easy to implement	Low budget
Conduct thorough mapping and inventory of critical infrastructure and facilities, ensuring their safety during various disasters.	Urgent	Complex	High budget
Conduct Earthquake Risk Assessments for all sector facilities: • Identify disaster-specific vulnerable spots in infrastructure areas and install sensors or meters to monitor risks.	Urgent	Complex	High budget

Photo: IFRC / Rob Few

7. SOCIAL SECTORS – HUMAN MOBILITY

Nine years have passed since the adoption of the Sendai Framework and the Paris Agreement, which remain crucial policy instruments for achieving the 2030 Agenda and the SDGs. These pioneering agreements confirmed the link between disasters and human mobility and have since boosted national and international efforts to address migration and displacement challenges in the context of disasters.

Mongolia's unique geographical location, demographic characteristics and the rural population's dependence on animal husbandry, make the country particularly vulnerable to environmental changes and severe weather events. The frequency, magnitude and duration of extreme weather events, often fuelled by climate change and compounded by other multi-hazard risks, are increasing and resulting in unprecedented consequences for migration, human mobility and displacement.

Short- and long-term internal migration has a longstanding tradition in Mongolia. However, data on short term movements (< 3 months) is not systematically collected. Recent trends indicate that rural to urban migration, particularly towards Ulaanbaatar, has been fostered by at least three key reasons: (a) A new legal framework (since 1992) granting freedom of movement to people after decades of Government-controlled movement; (b) Increased climate change-induced natural disasters, extreme weather and livestock loss, which have pushed rural people to seek better living conditions and employment in urban areas; (c) Increasing infrastructure development gap between urban and rural areas in Mongolia, for example in healthcare[33] access and education.

In Mongolia, the term "urban" usually refers to Ulaanbaatar, the capital city, which is 13 times larger than the second biggest city, Darkhan. Therefore, the sudden increase in migration in recent decades has led to Ulaanbaatar now accommodating over 1.5 million[34] people (45.9% of the total population), with multiple ramifications such as water, soil and noise pollution, heavy congestion, insufficient public service availability and the growth of large, urban-poor residential zones called "ger areas", the population growth and hazards have multiplied the risk of displacement within the capital. The Government has been taking several measures since 1994 to address the continuously growing internal migration flows. However, as these measures are based solely on movement restrictions, they have in turn caused or led to increased vulnerability, inequality and social exclusion, as well as growing poverty and irregular migration pathways[35].

The human mobility sector capacity diagnosis tool is used for capturing the degree of integration of human mobility aspects in national risk reduction and adaptation planning, focusing on the following main elements: (a) disaster displacement; (b) cross-border displacement; (c) evacuations; (d) planned relocation; (e) facilitated migration; (f) inclusion of migrants, displaced and refugees in DRR; and (g) assistance to nationals abroad. Depending on the context, a few or several of these elements are at the core of the national policies, some countries have developed extensive tools and preparedness capacities to address multiple forced displacement scenarios, others, depending on their capacity and risk assessment, have focused on the most likely scenarios. Mongolia's demographic and human mobility characteristics, as well as the absence of major displacement crisis within the last 75 years, have made the competent authorities to focus on preparedness towards sudden-onset small to medium scale internal displacement, partly de-prioritizing preparedness related to slow-onset

events and complexities associated with long-term solutions to displacement.

7.1 Governance

Legal framework:

In 2020, Mongolia started adopting several umbrella policies and legislation – namely the Law on Development Policy and Planning and its Management, Vision 2050, the New Recovery Policy, the Social Development Targeted Programme and the State Policy on Population Development – that contain clauses addressing migration and human mobility issues.

However, there is still a need to develop dedicated policy that governs and regulates internal migration and human mobility more systematically and effectively. In parallel with this gap, and also as a consequence of it, while frameworks regulating the preparedness and response to sudden onset events, including human displacement, are well structured, there is a lack of standards and policies enabling adequate responses to long term displacement and relocation.

Due to human mobility not being effectively managed in Mongolia through systematic policy and governance, unregulated migration flows to Ulaanbaatar have generated multiple forms of inequality, social exclusion and growing poverty in the ger areas.

The State Policy on Population Development is the key policy document on population movement[36]. The Government of Mongolia has developed three iterations of the policy – in 1994, 2004 and 2016 – with the purpose of ensuring sustainable development and growing the population's quality of life alongside population density. Upon expiration of the second population policy (2004), the Government of Mongolia renewed the Population Policy for the period 2016–2025, adopted through Resolution No. 261. The government, however, later issued a decree not to implement the policy (Decree No.314 in 2021). The data demonstrates that the volume of internal migration to Ulaanbaatar has consistently increased by 24,000 on average per year during the last decade[37].

Governance:

As covered in detail in the preceding sections of this report, NEMA is the agency overall responsible for coordinating the activities of different stakeholders involved in disaster response & response to sudden population displacement, including governmental and non-governmental organizations, the private sector, community groups, and international organizations. There is a collective understanding and awareness of extreme climate events becoming more frequent and a national and local level effort for governance structures to be accountable in their responses. However, human mobility remains most often considered as either a natural phenomenon and resilience strategy (when traditional) or as a nuisance and risk (when modern rural to urban migration). This dichotomy might reduce the space for deeper cooperation between DRR-mandated forums and actors working specifically on mobility.

While human mobility considerations are included in the DRR plans led by NEMA, mobility is part of these generally as a potential consequence of sudden onset disasters such as fire, earthquake or flooding. Detailed provisions and guidelines exist within the normative framework to organize the response to sudden onset disaster scenarios, including their impact in terms of mobility, such as evacuations, as successfully tested through

flood-related evacuations in Ulaanbaatar in August 2023. However, mandates are not that well defined in case of relocation or search for durable solutions to displacement, with a potential overlap as well between local and national level responsibilities, particularly in Ulaanbaatar, where local authorities have extended responsibilities. Protracted displacement situations, intertwined with rural to urban migration and CCA, present social and policy challenges for which the current legal and institutional framework is not sufficiently prepared. Also, the characteristics of the country (demographic, migration trends, hazard, etc.) encourage the adoption of a comprehensive framework defining and organizing currently needed or future relocations. However, this umbrella framework does not exist, and related responsibilities remain undefined between the different ministries, NEMA, and local authorities in Ulaanbaatar.

CBDRM mechanisms are an approach that would deserve further exploration in Mongolia, following the example of other countries where CBDRM initiatives have met success. While the institutional framework and arrangements are solid, and authorities work with communities to develop the DRR frameworks, including mobility considerations, communities could have more impact in their own preparedness, for example designing and implementing CBDRMs bottom-up approaches in selected fragile locations.

IOM has conducted in 2023 a situation analysis report that will inform the development of the road map for internal migration, which will outline the overall strategy, objectives, and implementation arrangements for mainstreaming internal migration into national and local policies of the Government of Mongolia.

Lastly, Mongolia has limited institutional preparedness capacity for addressing potential cross-border displacement. While responsibilities of the different actors and communication/action channels in case of cross border displacement are established, there is not sufficient preparedness capacity to address significant sudden cross-border displacement.

7.1.1 Strengths

- Solid country governance framework with well-defined roles and responsibilities in situations of sudden onset disaster.
- Appropriate visibility and empowered national DRR structures, with support from political power.
- Mobility considerations are included in the different DRR plans led by NEMA and responsible ministries, but only as a potential consequence of sudden onset disasters.
- NEMA has effective collaboration with most institutional partners, UN agencies, NGOs and the private sector, as well as international counterparts.

7.1.2 Gaps and challenges

- There are no clearly articulated rules or framework to address displacement resulting from slow onset events or CCA strategies.
- Mandates are not clear in case of relocation or search for durable solutions, with a potential overlap between local and national level responsibilities, particularly in the capital city of Ulaanbaatar.
- While national and regional authorities are aware of the potential displacement scenarios, they have not reached the consensus to address the fragilities conducive to forced mobility or resulting from it in a comprehensive manner.

- There are no sufficient provisions to address eventual large-scale cross-border displacement.

7.1.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Adopt a comprehensive framework defining and organizing relocations in Ulaanbaatar, such as relocation guidelines.	Urgent	Complex	Low budget
Engage an open discussion about a country IDP policy. Mongolia has skilled human resources but could develop and adjust its current normative framework for a better inclusion of human mobility at both local and national levels, integrating more comprehensively external stakeholders such as CSOs.	Not Urgent	Complex	Low budget
Promote more systematic community-based DRR (CBDRM) plans on a bottom-up approach that empowers communities at risk and builds their resilience.	Not Urgent	Easy to implement	Low budget
Establish a framework with neighbouring countries to articulate specific cooperation mechanisms in situations of sudden cross border disasters and resulting cross border population movements.	Not Urgent	Easy to implement	Low budget
Institutionalize migration governance. To ensure the successful and effective implementation of migration-mainstreamed policies and plans, there is a need to institutionalize migration and dedicate more targeted resources to it, for example, by establishing an agency, department or unit for migration management and migrant integration at the national level, but, more importantly, at the municipal and local levels, primarily in the Municipality of Ulaanbaatar.	Urgent	Complex	High budget

7.2 Implementation

An independent evaluation conducted in 2020-2021 by the Ministry of Labour and Social Protection (MLSP), in collaboration with United Nations Agencies, identified a lack of human resources, as well as effective coordination and synergy between government agencies, to implement mobility-related activities. The evaluation pointed out that although the MLSP was involved in the reporting of migration activities, there was no designated specialist appointed to work on migration activities within the ministry. The Population Policy was terminated in December 2021, upon the enforcement of the DPPM, to be eventually succeeded by a future midterm targeted development programme on social development.

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.

Internal mobility and preparedness:

NEMA managerial and technical staff have regular trainings on addressing disaster displacement and decision-making procedures during a disaster response. Trainings are focused on the most likely scenarios such as flooding, earthquake and forest fires. Trainings provided to NEMA staff include scenarios of medium scale displacement and emergency response coordination with external non-state stakeholders such as NGOs and UN agencies. Staff of NEMA and all other ministries and agencies encountered appear well qualified for their jobs and have a correct understanding of the displacement context and risks at both the national and local levels.

Relocation from areas at risk starts to be perceived as a necessity in some parts of the capital city, but concrete steps have not yet taken place for a safe and orderly relocation. This is partly due to the complexities of relocation, and to the lack of adequate facilities and a relocation plan at the city level. While relocation to safer grounds and habitations has been considered by the municipal authorities since at least a decade, the necessary resources for the achievement of large-scale plans have not been available. A major permanent relocation has never taken place, and the failure to organize safe and orderly relocations is one of the most concerning urban planning and preparedness bottlenecks that the capital city may have to address in the near future.

Migration from areas at risk has been a traditional resilience mechanism of rural Mongolia until this day. There are no specific protocols regulating migration, but pursuant to the Law on Land(Art. 3.1.3), land ownership is defined as "legitimate control of land with the right to dispose of that land". Only Mongolian citizens can own the land within the territory of Mongolia. In the city ownership is limited to 0.07 hectares of land. Residents of provinces may own 0.35 hectares. In the soums, the limit is 0.5 hectares of land. This flexible land ownership approach, together with the availability of land, facilitates relocation possibilities but is also open to interpretation and abuse, making orderly relocation and urban planning challenging in the absence of settlement control.

Nationals abroad and cross-border displacement:

Support to nationals stranded abroad in case of disaster is limited due to the limited size of the diplomatic network and available resources. This has been tested during the COVID-19 crisis, when many Mongolian citizens were unable to return and benefitted from IOM-sponsored assisted

voluntary return programming. However, ongoing efforts in this area, captured further below in this section, should improve the MFA's knowledge of and coordination with the diaspora.

The General Authority for Border Protection of Mongolia (GABPM) has the responsibility of protecting and controlling the official entry points and border areas of the country. As part of its border protection tasks, the GABPM reports to the National Security Council any incidence in the border that goes beyond the ordinary, such as events of large regular or irregular arrivals into the country. The communication and management systems are in place to report sudden cross-border displacement, but there is no dedicated planning in place to address the immediate consequences of a possible cross -border displacement. Due to the unlikelihood of an event of these characteristics, this option is not prioritized in terms of planning or allocation of resources.

Mongolia is not a signatory part of the 1951 Refugee Convention, therefore limiting the engagement of the country in cross-border refugee matters. The country has long borders (8252,6 km)[38] and a low population density that makes a significant cross-border displacement event both unlikely and hard to respond to. This should not be however an impediment for improved procedures and guidelines to support cross-border displaced persons or cross border evacuations. This is an area that the GABPM and NEMA may want to explore together and with their international counterparts.

7.2.1 Strengths

- NEMA staff have relevant and regular trainings on addressing disasters and decision-making procedures during a disaster response.
- NEMA and relevant state departments are well-qualified and have a proficient understanding of the potential displacement context in both Ulaanbaatar city and rural areas.
- Evacuation planning and preparedness is in place and continuously improving.

7.2.2 Gaps and challenges

- There are no specific procedures to address slow onset disasters and mobility due to CCA from rural to urban areas.
- Integration is limited with CSOs and social actors working to enhance the protection of vulnerable displaced groups and individuals.
- Insufficient infrastructural capacities for responding to medium scale or large-scale displacement (<10,000 displaced).
- There is not sufficient warehousing or sheltering capacity at any of the official international border crossings.

7.2.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Reinforce institutional links between NEMA and CSOs, facilitating technical inputs from CSOs and agencies working in the protection of migrants and vulnerable individuals.	Not Urgent	Easy to implement	Low budget
Continue the ongoing identification and equipment of additional evacuation sites in Ulaanbaatar.	Urgent	Easy to implement	Low budget
Establish systems to account for current and future land-use and development planning in migrant receiving areas, modelling future scenarios and taking advantage of the availability of land to orchestrate comprehensive development planning.	Urgent	Complex	High budget
Mobilize communities in the design and implementation of DRR and CCA, empowering them through a bottom-up approach, as recommended in the preceding section.	Not Urgent	Easy to implement	Low budget
Build and improve preparedness capacities at the main border crossings and train GABPM and NEMA staff in standard CCCM after adaptation of the material to the Mongolia context.	Urgent	Easy to implement	High budget/ Low budget

7.3 Financing

National sources:

The independent evaluation conducted in 2020-2021 by the MLSP and UN collected substantive data on the relevance, effectiveness, efficiency, impact and sustainability of the implementation of the Population Policy, including financing of mobility. According to the evaluation report, there were always budget deficiencies and human resource shortages in the implementation of planned activities. For instance, only about MNT 244 million was allocated and spent from 2016–2018. This amount was not enough to cover the wide range of planned activities, such as developing population and settlement plans, enabling education and health-care providers to work in rural areas and sustaining self-employment in the agriculture sector.

Financial provisions for disaster events are made through a budget to the NEMA and the two main national contingency funds, namely the Government Reserve Fund and the Contingency Fund. The Government Reserve Fund finances the relief effort from natural or man-made disasters. Part of the budget covers stocks of food, grain, and fuel strategically located across the country, the current total fund size is unclear. This is

complemented by the Contingency Fund which covers for unexpected disruption in domestic production, including disaster events related to natural hazards. Local governors can also make use of Local Governors' Reserve Funds.

As described earlier in this report, the limited availability of funds, as well as their unpredictability, makes it challenging to integrate disaster risk planning at both national and local levels. Emergency evacuation planning is prioritized as more safe shelters are being identified and equipped in Ulaanbaatar. However, additional funds would be necessary for addressing displacement preparedness at the longer term, as current financial planning enables temporary support to small and mid-scale displacement but cannot sustain the response to a longer crisis. While there are limitations on what can be done to increase funding, there could be efforts towards more predictable disaster displacement preparedness funding cycles at both national and provincial levels.

Besides regulated land allocation, there are no specific financial incentives to support organized human mobility, except for the bonuses paid to a majority of public and private employees when they choose to relocate and work in rural areas. This is considered a hardship bonus to compensate for the relative lack of amenities and isolation.

Diaspora and remittances:

A new diaspora engagement project, under the leadership of several ministries, implemented by IOM, and partnering with the National Statistics Office and the Council of Mongolians Abroad, is planned to strengthen the engagement between the Government of Mongolia and the diaspora. It is expected that this project supports the dynamization of diaspora engagement and remittances. In 2022 a diaspora mapping was conducted for the first time, it is estimated that in 2020 the diaspora sent back to Mongolia a total of USD 536[39] million, equivalent to 4 percent of the GDP and 12.5 percent of the Foreign Direct Investment. A lot of these remittances, particularly during COVID-19 restrictions, supported families and relatives with income in their areas of origin and benefitted from the reliable banking system. As part of the present re-engagement, the government has plans to establish a Diaspora Policy Unit within the Ministry of Foreign Affairs.

7.3.1 Strengths

- Multiple fiscal tools, described in earlier sections, are available for DRR and could fund human mobility preparedness: Legal provision on 1.0% budget allocation; State/ Aimag reserve, 30% of which can be used for disaster protection and recovery/ reconstruction; Natural resources fee; Budget tagging for DRR and climate; Performance-based supplementary budget allocation by MOF
- Emergency evacuations preparedness is relatively well funded as additional safe shelters are continuously identified and equipped.
- The banking system is accessible and well connected to international markets. E-payment systems are well developed and can be used in situations of displacement.

7.3.2 Gaps and challenges

- Availability of overall funding is limited. As highlighted in other sections of this report, the limited availability and unpredictability of funding makes it challenging to consistently integrate disaster risk planning at national and local levels.

7.3.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Explore systems to institutionalize more predictable funding – this would significantly facilitate preparedness and DRR/disaster displacement planning.	Urgent	Complex	Low budget

7.4 Knowledge

NEMA defines population mobility as the movement of people from one place to another, temporarily, seasonally or permanently for either voluntary or involuntary reasons. It describes the full range of mobility from short term movement (e.g. herders) to longer term or permanent relocation. Population displacement is reported from the local level khoroo administrative clerks to the districts and provinces, then to the central NSO. However, these statistics are not incorporated in a central database that comprehensively captures mobility and could be used for DRR and CCA initiatives. Available data is entirely based on the capacity of local level administrative units. Constituting a dedicated National Data Working Group would be beneficial for both preparedness and response.

Since 2018, IOM has supported Mongolia's National Emergency Management Agency (NEMA) to build its capacity in tracking climate change and disaster-related migration. IOM's DTM tool has been adapted to Mongolia's context and uses NEMA's data collection system to provide real-time information on population movements. In 2019, IOM and NEMA used DTM to conduct a baseline study in monitoring population mobility in Mongolia. The study supports the Government of Mongolia in the establishment of a comprehensive system to collect data on displacement caused by climate change and natural hazards and serves as a solid evidence base to inform preparedness and response efforts.

Approximately one third of migrant households in Ulaanbaatar are not registered. More than half of the unregistered migrant households live in ger areas. The migration ban was the main reason for not registering (precisely because migrants could not do so even if they wanted to). Also, it is relatively common for migrants to be unable to register their place of residence because of a lack of proper knowledge about the procedure and a lack of the necessary documents. Another reason why some migrants have not registered is that they are considering moving to another place or going back to their place of origin – two feasible options.

There is very strong technical expertise on data collection within both GASR and NSO, but the methodology used to collect the census is a relatively rigid address-based system. The current E-Mongolia, while very solid, has limitations when capturing mobile population patterns, whether in an emergency, in rural to urban migration, or as part of traditional nomadism. Recent work with IOM has shed some light on possible complementary methodologies for better capturing population mobility, including Displacement Tracking Matrix (DTM).

The last five years have witnessed the production of a significant number of reports and research on human mobility, such as the IOM-NEMA joint Mobility Monitoring for Disaster Preparedness in Uvs region (2018), the Internal Migration Situation in Mongolia Situation Analysis Report (IOM, 2023) mentioned earlier, the Research Study on Assessing the Effectiveness of Migration Restrictions in Ulaanbaatar City and Migrants' Vulnerability (IOM, 2021), and the Mongolia:

Migration and Employment Study (IOM, National University of Mongolia Population Training and Research Centre, and United Nations University – Maastricht Economic and Social Research Institute on Innovation and Technology, 2021), just to name a few. Data and conclusions resulting from these initiatives have not yet been integrated in DRR and CCA planning and implementation, and there is need for additional advocacy in order for the relevant institutions to acknowledge the usefulness of mobility data for DRR and preparedness planning.

Multiple protection case referral systems exist in parallel and require unification, this applies to protection both in regular times and during displacement. The Mongolian Gender Equality Center has mapped the existing referral mechanisms and proposed unifying strategies that could be explored by the relevant authorities and partners.

Lastly, databases compiling information on international migrants, refugees and other foreign citizens are hosted by the Border Management Agency, the Ministry of Foreign Affairs, NSO and other departments, and could also be brought together or better synchronised.

7.4.1 Strengths

- There is strong technical expertise on data collection and analysis within both GASR and NSO, with well-qualified personnel and suitable facilities.
- Recent work with IOM has shed light on possible complementary datasets and methodologies for better capturing population mobility, such as the DTM capacity programme that ended in 2023.
- Risk awareness mechanisms inform people via a variety of platforms, and reach out to displaced populations reasonably well considering the logistical challenges of the country's size and low population density.

7.4.2 Gaps and challenges

- The methodology used to collect the census is truly solid but lacks flexibility to work efficiently in case of sudden displacement or to capture dynamic mobility data.
- Data and conclusions resulting from research initiatives conducted during the last three years have not yet been integrated in DRR and CCA planning and implementation.
- There is no system in place to centrally manage data on migrants and foreigners in the country.
- There is no unified referral mechanism for protection cases, this needs to be fixed and represents an additional risk for vulnerable people in contexts of displacement.

7.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Unify or link the databases on foreigners and migrants into a single database.	Not Urgent	Complex	Low budget
Create and centrally manage a unified country-wide protection cases referral mechanism.	Urgent	Complex	Low budget
Establish a country Information Management & Data Working Group.	Not Urgent	Easy to implement	Low budget
Re-engineer or reform the residency registration service so that it: • Relies less on hard evidence of property ownership or rental, focusing more on motivating mobile populations to inform authorities of their location in an honest and timely manner; • Is available online; • Implements campaigns to encourage migrants to register as soon as they move to the capital city.	Urgent	Complex	Low budget
Continue de-linking public services from migrants' places of residence and link them to the individuals themselves. At the same time, simplify residency registration and increase access to registration, especially for the most vulnerable.	Urgent	Complex	Low budget

7.5 Technology and equipment

NEMA and LEMA dispose of adequate (though occasionally aging) technologies and communication equipment to respond to displacement but have gaps in terms of prepositioned items, and need to equip additional evacuation sites, especially with winterization equipment. There are generally sufficient resources and technologies available at the central level, but less so at the provincial and local levels. A more exhaustive assessment of resources could be conducted, if requested and agreed upon by NEMA, since details on exact resources available within NEMA, both human and material, are protected by law, which made it impossible to conduct an accurate assessment in this area. It appears however that most provinces and all main border crossings have limited availability of shelter materials or NFIs, even for a smaller case displacement or crisis.

Winterization materials are essential in the context of Mongolia and must always be available in stock as they can prove life-saving. Given local production of gers, and the proven expertise of most population in their use, it could be explored to invest and keep traditional gers as winterization or back up winterization solution in case of displacement, in addition to or in combination with shelter materials of internationally accepted standards.

Lastly, border authorities are not sufficiently prepared to manage sudden or intense inflows of people in the context of disasters, an unlikely scenario. There are no contingency stocks available or resources at the borders to respond to sudden cross-border displacement. Current capacity is only sufficient to hold a few individuals during a short period of time until these are referred to specialised facilities in either the national capital or provincial capitals.

7.5.1 Strengths

- Well-structured system of warehousing management and strong logistics.
- Centralized willingness to invest and maintain national and provincial preparedness capacities.
- Regular communication about risks and hazards, including displacement, between the central and provincial NEMA offices.

7.5.2 Gaps and challenges

- Limited prepositioning of emergency materials in case of larger scale disaster (+10,000 displaced) or protracted displacement.
- Limited availability of stocks and materials outside the capital and potential delay in delivery times.

7.5.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Invest on additional prepositioning of winterization materials, this is life-saving material in the context of Mongolia. Explore traditional and non-traditional winterization methods.	Urgent	Complex	High budget
Establish dedicated provincial response stocks also in the capital, with a pipeline for quick delivery.	Not Urgent	Complex	High budget
Set up small-scale transit centres near the main border crossings.	Not Urgent	Easy to implement	Low budget
Determine a standardised NFI relief kit for response to internal displacement in Mongolia, this could reduce procurement costs and improve delivery times.	Not Urgent	Easy to implement	Low budget

Photo: UNDP/Mongolia

8. SOCIAL SECTORS – SOCIAL PROTECTION

Social protection is the leverage of several Sustainable Development Goals, such as reducing poverty and inequality, improving decent work and economic growth, improving good health and wellbeing, and quality education. In this sense, the provision of accessible social protection services during any potential disaster or crisis is important to reduce the negative impact on the population of any shocks or natural disasters, including those induced by climate change. In times of disaster, there are people and social groups who are regularly more vulnerable to the many adverse effects of multiple hazards, for example, women, girls, children, people with disabilities, the elderly, immigrants, refugees, and people with chronic diseases. Therefore, it is important for the social protection sector to take into account how the social situation can evolve and change during disasters, to consider the specific risks of specific individuals and vulnerable groups, and prepare to meet their special needs.

According to the survey released by the National Statistics Committee of Mongolia in 2022, the total population of Mongolia reached 3,457,548, an increase of 1.4% from the previous year (51% women and 49% men). As of 2022, there are a total of 115,115 people with disabilities in the country (3% of the total population), and 281,016 people aged 60 and over (8% of the total population). In total, 1,104,799 are children aged 0-14 (32 percent of the total population). These statistics illustrate the high proportion of vulnerable population that would require specific social protection support in times of disaster.

The MLSP is responsible for having full-time disaster protection staff in charge of the implementation of disaster risk management in the field of social protection, as well as for calculating and reducing disaster risk in the development policy and strategic planning of the sector.

In addition, the ministry is responsible for ensuring the continued operation of social protection during disasters and emergencies, and for the development and implementation of relevant regulations, guidelines, instructions, and standards. However, after analysing the legal documents relevant to the sector, it appears that the issues of effective disaster risk management in the social protection sector are not reflected at all levels. Due to the lack of legal framework and policy planning, relevant rules, regulations, guidelines, standards, and approaches have not always been developed.

For the social protection sector, the area of exposure to disaster risk is wide. The challenge remains how to solve the impediments that vulnerable groups may face in the event of a disaster, what measures to implement, and how to respond to shocks, the responses to these questions are not sufficiently clear.

8.1 Governance

The labour and social protection sector has a strategic plan for the 2021 to 2024 period, and there are 30 commonly used laws that ensure the implementation of 41 laws in the sector. Analysing the existence of current provisions to strengthen disaster management in these laws, eight provisions

were included in a total of seven laws. There are two legal provisions in governance, two provisions related to knowledge, three provisions related to financing, and one provision related to technology and equipment. In addition to this, it is clarified that if any disaster or danger occurs, the relevant state organization will implement the duty of protection in accordance with the emergency and in line with the laws and regulations. The agencies operating in the field of social protection have not however comprehensively aligned with the Disaster Protection Law and other related regulations when developing policies, strategies, and legal documents for their sector.

The MLSP issues 12 different types of social assistance to the elderly, disabled people, senior citizens, children, mothers and citizens in need of other forms of social welfare support. However, there is no specific plan on what measures to take and how to manage the social assistance in the event of a disaster, how to quickly identify the needs of the vulnerable population, whether mobile or not, and how to protect people with disabilities in different situations, continuing social protection activities in a shock-responsive manner.

8.1.1 Strengths

- The expected activities of ministries of social sectors during various disasters that may occur are clearly reflected in the Disaster Protection Law and related regulations.
- The system for providing social welfare services of the MLSP is well established. For example, during the recent COVID-19 pandemic, floods, droughts, severe snow and dust storms, MLSP has been able to safely deliver humanitarian aid and cash transfers from international organizations to the desired target groups.
- Pensions and allowances are provided by the state in order to meet the minimum needs of citizens who have poor health, lack of family care, cannot live independently or have other specific needs and vulnerabilities.
- The social protection sector collects and provides relevant information to help the target groups, including people with special needs. This shows that it is possible to coordinate the disaster protection within the existing legal framework and operating procedures. For example, the Department of Family, Children and Youth of the MLSP cooperates with many stakeholders in the field of Child Protection, and with their participation, a standard for Child Protection During Disasters has been developed.

8.1.2 Gaps and challenges

- Policy documents and legislation in the field of social protection do not include specific provisions on disaster management, including how to respond to potential shocks and how to reach out to vulnerable social groups.
- There are no relevant rules, guidelines, standards, and assessment methods to determine how vulnerable groups of society are exposed to potential disasters and shocks, and what specific needs arise from these.
- Although the central state administration organization in charge of emergencies managed to create a good policy planning and legal framework, it has limited capacity for providing inter-sectorial methodology and monitoring in a situation of disaster.
- There is no structure or unit responsible for disaster issues within the social protection sector, one employee in each organization has the double responsibility for his main job and as focal point for disasters. Staff working as focal points for disasters do not generally have the support of the organization's management, incentives, or a team to collaborate with.

8.1.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Collaborate more closely across social sector service providers to enhance interdisciplinary coordination.	Not Urgent	Easy to implement	Low budget
Analyze the MLSP's ability to coordinate disaster-related activities, considering its structure, database, human resources, and social networks.	Urgent	Complex	Low budget
Integrate and adapt international humanitarian standards into social protection governance and strategies.	Urgent	Complex	Low budget
Perform sector-specific disaster planning with a focus on diverse social groups & develop comprehensive plans to respond to potential shocks impacting different social demographics.	Not Urgent	Complex	Low budget
Appoint dedicated full time DRR focal points in the social protection sector institutions and train them so that they can become DRR leaders in their agencies.	Not Urgent	Easy to implement	High budget

8.2 Implementation

Disaster prevention trainings are aimed at training and empowering officials, employees and citizens of state and local administrative organizations. In this context, training is organized regularly in the following categories: management officials, emergency organizations, students, children of pre-school age, state and local administrative organizations, legal entity officials, employees, disaster protection services, professional classes, and regular citizens. However, sector-specific capacity building is lacking. Due to the small number of trained representatives, there is a lack of skills, knowledge, and human resources to understand the specific problems of each sector and to then replicate the trainings with other employees within each organization or sector.

Since the social protection sector is considered one of the state's disaster protection services, a sector-wide disaster protection plan has been developed. However, during past disasters, such as the recent COVID-19 epidemic, when attempting to work according to the disaster protection plan, it appeared that employees of the social protection sectors did not have sufficient understanding of their roles and responsibilities, nor did they know how to reach out to vulnerable groups of society, lacking clear and practical guidelines to complete their work.

Therefore, temporary procedures had to be rapidly developed specifically for COVID-19. There are no rapid assessment methods to determine the needs of target groups in need of

assistance during disasters and no registration system for use in emergency situations.

8.2.1 Strengths

- There are training modules for public awareness of disasters developed with the support of disaster management projects of international organizations, international humanitarian standards translated into Mongolian that can be used in every sector, and various research reports made to identify social protection challenges.
- The MLSP and implementing agencies have a strong network to ensure the safety and security of the lives of vulnerable social groups in need of assistance, a system for providing accessible social security and welfare services in peacetime, and methods for collecting relevant data.

8.2.2 Gaps and challenges

- Due to the lack of disaster risk assessment in the social protection sector, other sectorial plans are used as basis for the social protection components, but these are not sufficiently adapted or suitable.
- Due to the limited capacity of the MLSP, it is challenging to discuss the issue of disaster protection at the social protection level and get the necessary support from the relevant departments to form a comprehensive disaster management system.
- There is a lack of understanding on how professional organizations and social protection agencies can work together in a disaster. Professional support is sought from social security, but sector-wide coordination is sought from emergency organizations.
- During a disaster, it is difficult for the MLSP to cooperate with social protection actors and local organizations. In Mongolia, emergency commissions are established in times of disasters, and ministries at the state and provincial authorities at local levels are organized as disaster protection & specialized units under the leadership of emergency services. This does not allow the MLSP to directly manage its branches during disasters.
- Disaster prevention trainings have not been organized at the level of specific sectors. This does not allow the social protection sector to identify its priorities and to differentiate between disaster response measures.
- Current training materials do not have versions for target groups, including people with different types of disabilities.
- Organizations that provide services to the community do not have disaster experts, so there are different professionals who are responsible for disaster issues, for example, finance, human resources, training specialists, treasurers, etc., who have dual responsibility for disaster-related questions in addition to their main duties.

8.2.3 Recommendations

- The organization in charge of emergency issues will analyze the training methods and content, and include content that is suitable for the specifics of the line ministries and related agencies. There is also a need to develop more options for practical training. (For example; one sector-level training, cross-sector training to improve the interoperability of multiple sectors, training aimed at improving the sector's disaster protection plan, etc.)
- Establish a disaster management team consisting of representatives of departments while appointing disaster management experts to enterprises.
- Promote international humanitarian response standards in the field and how they can be implemented in harmony with the current system.
- Address areas that need to be improved using the multi-disciplinary research reports conducted in the field of social protection.
- Special attention should be given to increasing public awareness of disaster prevention, especially to develop training materials in collaboration with educational institutions for social groups such as people with disabilities, their caregivers and the elderly.

Recommendations	Urgency	Ease of implementation	Cost
Analyse training methods and content by the organization responsible for emergencies, ensuring suitability for the specifics of line ministries and related agencies.	Not Urgent	Complex	High budget
Develop a variety of practical training options, including sector-level training, cross-sector training for interoperability, and training focused on improving sector-specific disaster protection plans.	Not Urgent	Complex	Low budget
Promote the implementation of international humanitarian response standards in the field, ensuring they align with the existing system.	Urgent	Easy to implement	Low budget
Address areas that need to be improved using the multi-disciplinary research reports conducted in the field of social protection.	Not Urgent	Complex	Low budget
Develop and improve training materials in collaboration with educational institutions, specifically tailored for social groups like people with disabilities, their caregivers, and the elderly.	Urgent	Complex	Low budget

8.3 Financing

After analysing 30 legal frameworks widely used in the field of social security; there are only three laws, namely the Law on Labor, the Law on Social Welfare, and the Law on Military Servicemen's Pensions and Benefits, that can relate to social protection in disasters or special circumstances. However, none of these provisions fully consider the disaster management system. In addition, there is no mention of the allocation of funds and budgets intended for use in times of disaster.

8.3.1 Strengths

- Although there are no budgeted funds during disasters, allocation of state resources such as the government's reserve fund, governor's reserve fund, etc. distribution of allowances and the distribution of humanitarian aid by international organizations has been generally sufficient to address the most pressing challenges, particularly among the most vulnerable.

8.3.2 Gaps and challenges

- Due to the lack of provisions for disaster management and response to potential shocks in the legal environment of the social security sector, there is no specific basis for relevant budget planning.
- Under the current social welfare law, a citizen or family affected by a disaster receives a one-time benefit of 1,200,000 ($340) thousand MNT, regardless of the amount of assets lost by the disaster.
- The social protection sector does not have a shock-responsive social protection plan, and there is no provision for planning a budget related to disaster management in the legal environment, so there is no social protection budget for disaster risk reduction, disaster response and recovering after a disaster.

8.3.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Plan a budget specifically for reforming the social security legal environment and strengthening the disaster management system.	Not Urgent	Complex	High budget
Making the one-time benefit amount received by citizens post-disaster flexible and adapted to the levels of loss and vulnerability	Not Urgent	Complex	Low budget
Procure special equipment, develop communication channels, and skills in the field of social security, with a focus on reaching out to people with special needs.	Urgent	Easy to implement	Low budget

8.4 Knowledge

Although the social protection sector has its own system for collecting data related to the provision of social care services, it does not include data content for use in disaster response. Each sector that provides services to the community collects data for its own activities, but in the event of a disaster, there is a need to re-collect the necessary information at that time.

8.4.1 Strengths

- NEMA provides instructions for developing a disaster protection plan based on the methods of disaster risk assessment for each type of hazard, and related training activities are underway.
- The MLSP is fully capable of conducting a wide range of data analysis based on available research resources at all levels of society.

8.4.2 Gaps and challenges

- There is no mechanism for monitoring, evaluating and reporting humanitarian activities in the social protection sector.
- It is not currently possible to provide rapid information on the location of high-risk areas and specific target groups during any disaster.
- Humanitarian organizations and emergency organizations are not provided with timely information about vulnerable social groups and their specific needs.
- The MLSP and the Agency for Disabled Persons do not cooperate sufficiently with methodological recommendations on how to work with vulnerable social groups, including people with disabilities.

8.4.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Analyse the data that can be collected from the current information systems for use in disaster response, specifically in the areas of climate change and disaster preparedness.	Not Urgent	Complex	High budget
Utilize risk maps, weather reports, and earthquake micro-region maps from emergency organizations and research institutes to assess disaster risks and the exposure of vulnerable groups, including people with disabilities.	Not Urgent	Complex	Low budget
Create detailed survey maps identifying vulnerable groups who require assistance.	Urgent	Easy to implement	Low budget

8.5 Technology and equipment

Until now, the social protection sector actors have not made a specific and comprehensive assessment and of their overall equipment and technological capacity to sustain preparedness and DRR. Therefore, it is difficult to diagnose the current technology, information management system, human resource capacities and areas for further improvement in this field. Based on the experience of working during the COVID-19 epidemic, when the quarantine was established, the employees of the social security sector were mobilized to visit the emergency management office in turns to monitor and maintain records of people entering and exiting through mandatory checks. The difficulty at that time was that although the professionals were fully provided with protective equipment, and the safety of workers was appropriate within the boundaries of COVID-19 facilities, there were no regulations aimed at providing protective equipment and equipment for workers in other sectors.

8.5.1 Strengths

- The MLSP is capable of operating at a very large-scale system in terms of delivering social security and social welfare services to the target groups of society, regulating labour relations, collecting information in the field of social protection for disabled people, the elderly, children and women, and making cash transfers.

- While the MLSP standard system has the potential to become a baseline for disaster preparedness, it is not specifically linked to climate change or disaster situations and is a ready-to-use system whenever required.

8.5.2 Gaps and challenges

- The country is overall unprepared for sector-wide disaster response in terms of ensuring continuation of the social protection network. This is accompanied by a lack of experience by social protection actors in working in disaster situations, other than increasing access to care for targeted social groups.
- Vulnerable social groups, including people with disabilities, do not have equipment for being informed about early warning of danger, and there are no regulations in place on how to reach out to them and what specific response measures can be taken to support them.

8.5.3 Recommendations

Recommendations	Urgency	Ease of implementation	Cost
Enhance applied information technology tools to better gather, share, and analyse data about vulnerable groups in times of disaster.	Not Urgent	Complex	Low budget
Fortify the disaster protection management system across all levels, ensuring the effective implementation, monitoring, and provision of feedback with the special focus on vulnerable groups in times of disaster.	Urgent	Complex	Low budget
Proactively address potential adverse impacts and challenges that vulnerable groups may encounter during disasters by developing accessible early warning systems.	Urgent	Easy to implement	High budget
Improve the quality and suitability of resources and supplies used in disaster response and reconstruction to meet the specific needs of vulnerable groups.	Not Urgent	Complex	High budget

ANNEXES

Annex I: List of institutions consulted

Ministries and Agencies

National Emergency Management Agency

National Institute for Security Studies

National Rescue Brigade

Ministry of Food, Agriculture, and Light Industry

- Policy Planning Department
- Livestock Policy Implementation and Coordination Department
- Crop Policy Implementation and Coordination Department
- Food Policy Implementation and Coordination Department
- General Agency for Veterinary Services

Ministry of Health

- Medical Care Department
- Policy Planning Department
- Public Health Department

Ministry of Labor and Social Protection

- Social Welfare Policy Implementation Coordination Department

Ministry of Road and Transport Development

Ministry of Science and Education

Ministry of Construction and Urban Development

- Sectoral Monitoring Department

Ministry of Digital Development and Communication

Ministry of Economic Development

- Integrated Policy and Planning Department

Ministry of Energy

- Monitoring Department

Ministry of Environment and Tourism

- Administration Department
- Special Envoy of Mongolia on Climate Change

Ministry of Finance

- Construction Engineering and Policy Coordinating Department
- Sectoral Monitoring Department (MCUD)
- Development Policy and Urban Development Department

Information and Research Institute of Meteorology, Hydrology and Environment

- Climate and Environmental Numerical Modeling and Research Department

Forest Agency of Mongolia

National Agency for Meteorology and Environmental Monitoring

- Prevention of Hydrometeorological and Environmental Department

Agency for Land Administration and Management, Geodesy and Cartography (Spatial Information Division)

Construction Development Agency

- Building Blueprint Monitoring Department
- Building Code Department

Financial Regulatory Commission

- Insurance Department

Social Insurance General Office

- Operational Division

General Authority for Development of PWD

- Administration Department

Geodesy and Water Construction Agency

- Elevation Planning Department

National Statistics Office

- Data Analysis Department

Capital City

- Air Pollution Reduction Department
- Emergency Management Department
- Policy Implementation Monitoring Division

City Governor's Office

- Environment and Air Pollution Reduction
- Mayor's Administration Department
- Policy Development and Planning Department
- Secretariat of the Capital City Emergency Management Agency

Institute of Astronomy and Geophysics

Mongolian University of Life Sciences

- Biology Institute
- School of Civil Engineering and Architecture

Mongolian University of Science and Technology

- School of Civil Engineering and Architecture

National University of Mongolia

- Geology School

NGOs

- Mongolian Red Cross Society
- People in Need
- Save the Children
- World Vision Mongolia
- Association of People with Wheelchair

UN Organizations

- Human Rights Commission
- National Committee on Gender Equality to UN House
- World Health Organization

Private companies

- Mongolian National Reinsurance JSC
- Nomin Insurance

Annex II

Capacity assessment questionnare

This survey aims to assess the extent to which disaster preparedness is integrated into the operations of NEMA. It was initiated to complement the evaluation of preparedness, response, and early warning capacities undertaken by NEMA as part of the CADRI assessment.

Question 1. Kindly specify the entity you are affiliated with professionally

- NEMA HQ
- LEMA

Question 2. Please indicate your location.

- Arkhangai
- Bayan-Ulgii
- Bayankhongor
- Bulgan
- Darkhan-Uul
- Dornod
- Dornogovi
- Dundgovi
- Govi-Altai
- Govisumber
- Khentii
- Khovd
- Khuvsgul
- Orkhon
- Selenge
- Sukhbaatar
- Tuv
- Ulaanbaatar
- Umnugovi
- Uvs
- Uvurkhangai
- Zavkhan

Question 3. Please indicate your rank

- Sergeant
- Officer
- Senior officer

Question 4. Please indicate your education level

- High school
- Higher degree (University)
- Advance degree (Master and above)

Question 5. Please indicate your gender

- Male
- Female

Question 6. How many years have you been with NEMA/LEMA?

- Less than 2
- 3-5
- 6-10
- More than 10

Question 7. Please indicate the duties/responsibilities that you associate the best in your position.

- Assess disaster risks
- Develop disaster risk management plan
- Implement the disaster risk management plan
- Monitoring of the implementation of the disaster risk management plan
- Conduct trainings
- Fire and emergency response
- Emergency operations
- Finance and administrative tasks

Question 8. Who should be responsible for leading the preparedness?

- NEMA/LEMA
- Sector-responsible Ministry
- Local authorities
- Disaster risk management council
- State Emergency Commission
- Emergency Operations Center EOC

Question 9. Mark all stakeholders who should be involved in the preparedness activities for various disasters?

- NEMA/LEMA
- Sector-responsible Ministry
- Local authorities
- Disaster risk management council

Question 10. Please self-evaluate your capacity to take over preparedness activities for the following disasters (1-very poor; 2 – poor; 3-fair; 4-good; 5-very good)

- Drought
- Dzud
- Fires (forest, steppe)
- Fires (urban areas)
- Floods
- Earthquake
- Extreme weather events (e.g. strong wind, etc)
- Human and animal infectious diseases
- Sudden population displacement

Question 11. How confident do you feel in the following tasks or areas of knowledge?

disasters (1-not confident; 2 – poor; 3-fair; 4-good; 5-very confident)

- Emergency response operations (field operations: rescue operation, evacuation, firefighting)
- Guiding colleagues from within/outside NEMA/LEMA what risk reduction measures should be taken specific disaster scenario.
- Coordinating ministries and local government departments in the process of rehabilitation and reconstruction after a disaster.
- Knowledge of laws and regulations for disaster risk reduction.
- Knowledge of different natural hazards and why disaster happens.

Question 12. Chose three best ways to reduce disaster risk.

- Stockpiling relief items and distributing them efficiently when disaster hits.
- Making public buildings, hospitals, and schools resilient to earthquake.
- Improve weather and climate forecasting.
- Educating your child(ren) or family members on how to prepare for a disaster event.
- Drive an electric vehicle.
- Insuring your house and car against disasters.
- Increase financial resources to strengthen flood protection facilities.

Question 13. Please indicate what you would need to implement disaster prevention activities as a part of your professional duties:

- Improved knowledge on what is prevention
- Capacities to train others
- Financial resources
- Information, data
- Physical assets and tools, emergency kits
- Time dedicated to the prevention activities

Question 14. Please share any other idea, insight or recommendation that you would like to share with the assessment team

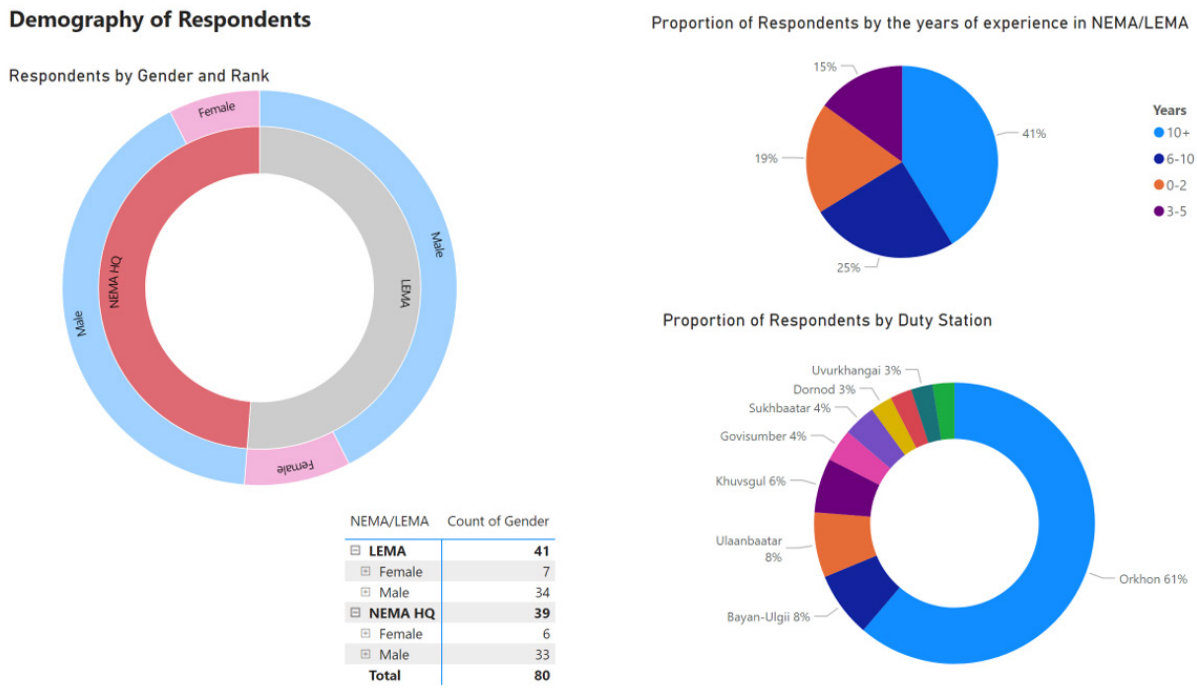

Figure 21. Demography of respondents

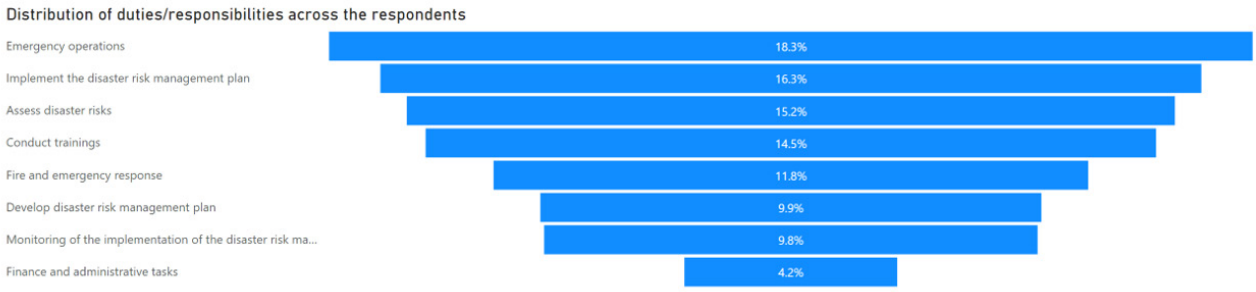

Figure 22. Distribution of duties across the respondents

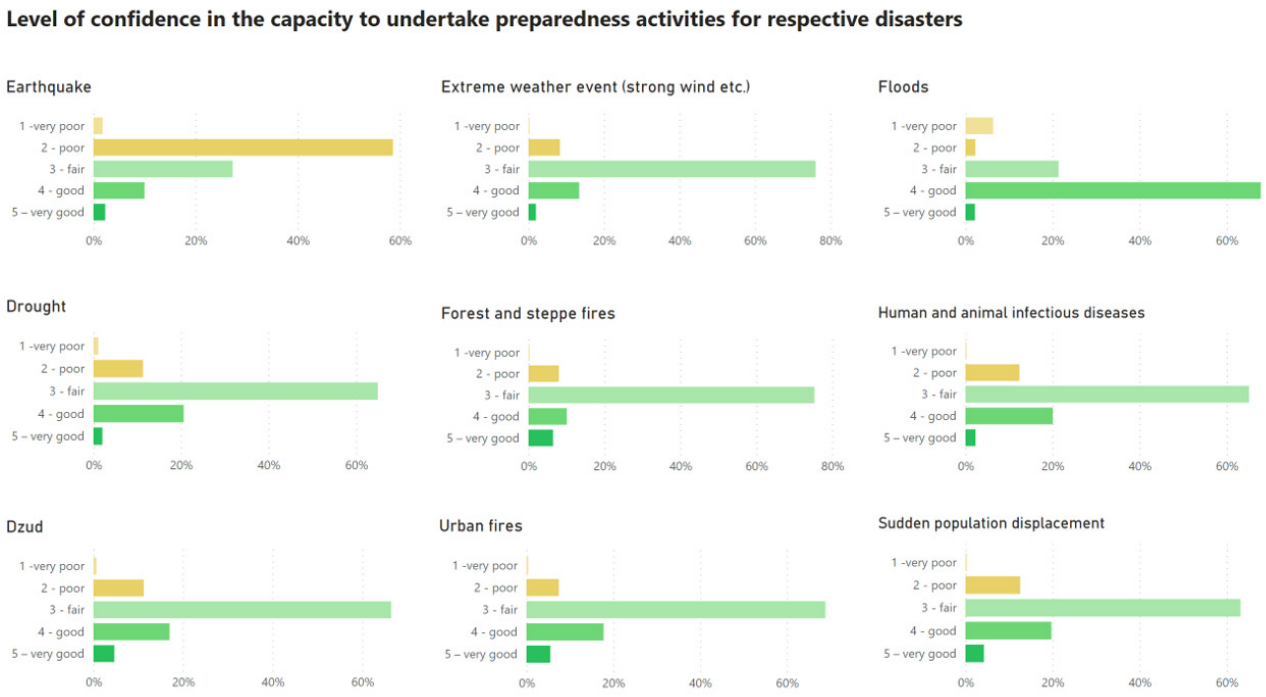

Figure 23. Level of confidence in the capacity to undertake preparedness activities for respective desasters distribution of duties across the respondents

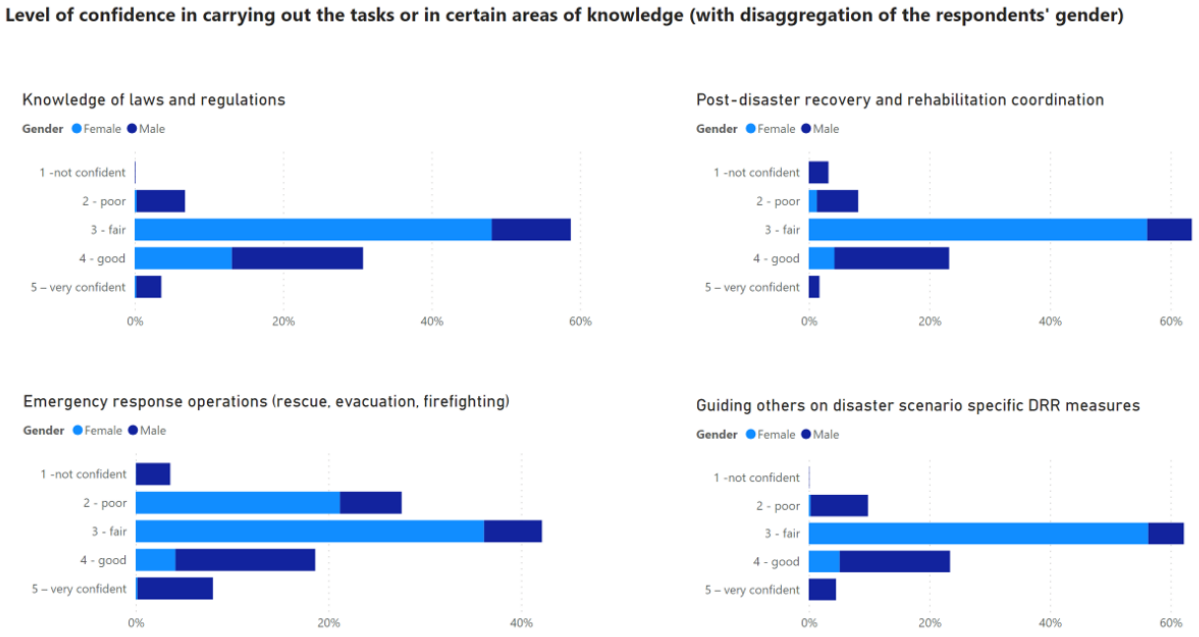

Figure 23. Level of confidence in carrying out the tasks or in certain areas of knowledge

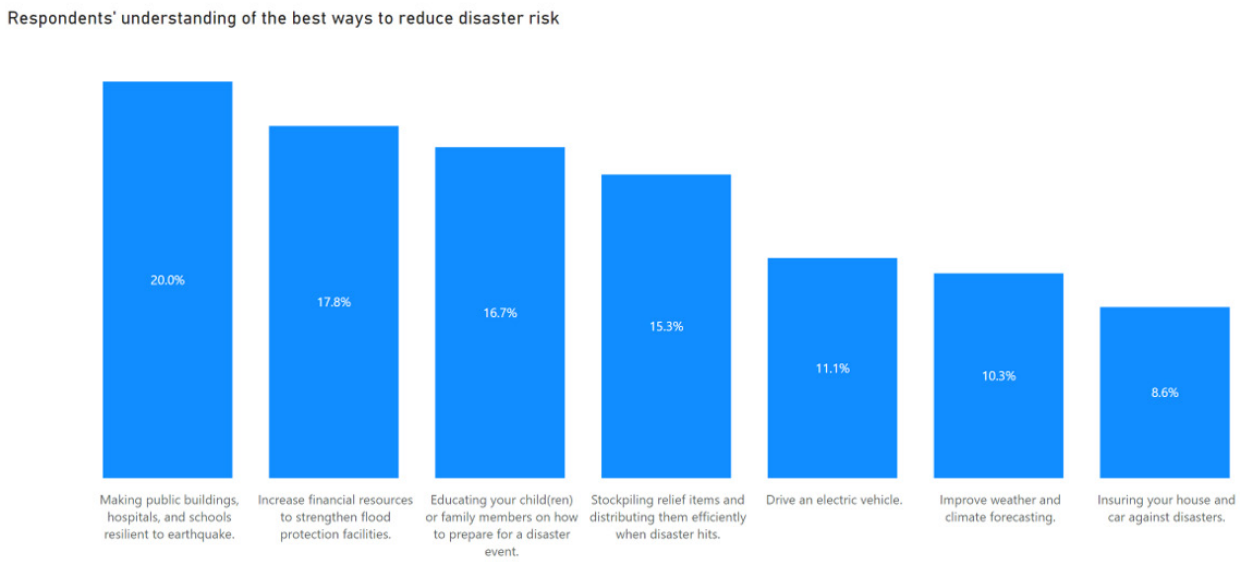

Figure 24. Respondents' understanding of the best ways to reduce disaster risk

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3 Climate change impacts on health and livelihoods. Mongolia assessment, 2021
4 The impact of climate change on education n Mongolia. UNICEF Mongolia CO, Ministry of Education and Science, 2019
5 The Government Order No.08 of 2004
6 IRIMHE (2023) Updated Meteorological Hazard Maps for Mongolia (draft), prepared as part of the ADB's TA-9880 Mongolia Strengthening Capacity on Disaster Risk Assessment, Reduction and Transfer Instruments in Mongolia
7 Suzuki, Y., T. Nakata, M. Watanabe, S. Battulga, D. Enkhtaivan, S. Demberel, C. Odonbaatar, A. Bayasgalan, and T. Badral (2020). Discovery of Ulaanbaatar Fault: A New Earthquake Threat to the Capital of Mongolia, Seismol. Res. Lett. 92, 437–447, doi: 10.1785/0220200109
8 Originally developed as a system to manage ambulances and fire brigades.
9 https://www.desinventar.net/
10 Mongolia, The Project for Strengthening the Capacity of Seismic Disaster Risk Management in Ulaanbaatar City, Final Report, Volume 2 Main Report (2013), Asian Disaster Reduction Center, Urban Disaster Research Institute, Tokyo Electric Power Service Co., Ltd.
11 Tumurbaatar, Z.; Miura, H.; Tsamba, Ts. Development of Building Inventory Data in Ulaanbaatar, Mongolia for Seismic Loss Estimation. ISPRS Int. J. Geo-Inf. 2022, 11, 26. https://www.mdpi.com/2220-9964/11/1/26
12 ICEM (2023) National Disaster Risk Assessment of Mongolia (draft), prepared as part of the ADB's TA-9880 Mongolia Strengthening Capacity on Disaster Risk Assessment, Reduction and Transfer Instruments in Mongolia
13 Livestock insurance was introduced in 2005 with the assistance from the World Bank
14 In 2014, the Government of Mongolia established Agricultural Reinsurance Co. Ltd., which was expanded and renamed to the Mongolian National Reinsurance Co. Ltd., in 2018. Currently, the Mongolian National Reinsurance holds 15% of the total insurance market in the country.
15 Currently, there's a law for seed crop insurance, but its high premiums (8% of the insured asset value https://legalinfo.mn/mn/detail/14) have limited its adoption. To address this, a new draft law on crop insurance is being developed.
16 It will cover various types of properties, with insurance indemnities ranging from 5 million to 50 million tugrugs depending on the property type
17 As of September 2023, fifth version of the Law on Risk Insurance is prepared
18 The following agencies' projects have been mapped: ADB, Asia Foundation, Care International, EEAS, EBRD, FAO, GIZ, IOM, JICA, Mercy Corps, Mongolian Red Cross, OCHA, People in Need, UNDP, UNEP, UNESCAP, UNESCO, UNFPA, UNHABITAT, UNICEF, USAID, SDC, WFP, WHO, World Bank, World Vision.
19 p.40-41, Mongolia National Mid-term Review of the Sendai Framework for DRR, 2022
20 https://inff.org/country/mongolia
21 International Search and Rescue Advisory Group
22 There is a coalition of NGOs called the Environmental Civil Council which has approximately 320 non-governmental organisations nationwide.
23 Report from Mongolia, UN Convention to Combat Desertification, March 2023
24 https://www.gazar.gov.mn/storage/reports/October2023/oiur13U7gxFAioKwVrC2.pdf
25[1] Government of Mongolia, 2019. National Program on Soil Conservation and Reduction of Land Degradation. https://www.legalinfo.mn/annex/details/10091?lawid=14627
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27 https://openknowledge.worldbank.org/server/api/core/bitstreams/6cd7c24b-a3c3-5c67-b6b5-3d0f5f600b5c/content
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30 Comprehensive school safety assessment in Mongolia. Ulanbaatar, Mongolia, 2018, UNICEF

31 A study indicates several existing building standards for accessibility with a need of improvement in the standard itself and compliance. (Source: Living with Disability in Mongolia - Progress Towards Inclusion, ADB, December 2019)

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34 United Nations Statistics Division, 2022.

35 International Organization for Migration (IOM), 2023. Internal Migration Pathways Situation in Mongolia: Situation Analysis Report. IOM, Ulaanbaatar.

36 Other Mongolian legislation governing migration and migration-related issues includes the following: (a) 1992 Constitution of Mongolia (Constitutional Court of Mongolia, 1992); (b) 2022 Civil Code of Mongolia (State Great Khural of Mongolia, 2002); (c) 2018 General Law on State Registration of Mongolia (State Great Khural of Mongolia, 2018a); (d) 2018 Law on Civil State Registration of Mongolia (State Great Khural of Mongolia, 2018b); (e) 2018 Guidelines for registering and reporting civil movements within the territory of Mongolia (Government of Mongolia, 2018).

37 International Organization for Migration (IOM), 2023. Internal Migration Pathways Situation in Mongolia: Situation Analysis Report. IOM, Ulaanbaatar.

38 The General Authority for Border Protection of Mongolia (bpo.gov.mn)

39 United Nations Statistics Division, 2022.

Photo: UNDP/Mongolia

UNITED NATIONS
MONGOLIA

CADRI
Partnership
Capacity for Disaster

Food and Agriculture Organization of the United Nations
IOM UN MIGRATION
UNDP
UNFPA
unicef
IFRC
WORLD METEOROLOGICAL ORGANIZATION
OCHA
unesco
UNOPS
World Health Organization
World Food Programme
GFDRR
GNDR
GDI
OECD
redr australia
UNDRR
UN Office for Disaster Risk Reduction
unitar
United Nations Institute for Training and Research
UN WOMEN