ASSESSMENT OF THE IMPACT OF NATURAL DISASTERS ON INTANGIBLE CULTURAL HERITAGE IN EASTERN REGION, MONGOLIA

Saruul Arslan [1], Enkhbat Galbadrakh [2], and Ankhsanaa Ganbold [3]

BACKGROUND

This paper examines and assesses Mongolia's intangible cultural heritage related to natural disasters based on a field survey conducted in the eastern region of Mongolia.

Mongolia has a high elevation, with a cold and dry climate. It has an extreme continental climate with long, cold winters and short summers, during which most precipitation falls. Mongolia's climate is characterized by extreme variability and short-term unpredictability in the summer, and the multiyear averages conceal wide variations in precipitation, dates of frosts, and occurrences of blizzards and spring dust storms. Such climate poses severe challenges to human and livestock survival. Official statistics list less than 1% of the country as arable, 8 to 10% as forest, and the rest as pasture or desert. Natural landscapes are characterized by alternating natural hazards such as extreme temperature fluctuations, severe storms, droughts, forest fires and *dzud* (National Statistics Office of Mongolia, 2022).

Mongolia is vulnerable to over ten natural hazards and disasters, including drought, *dzud*, floods, desertification, earthquakes, and human and animal infections. Unfortunately, the country experiences an average of 3,200 disasters and accidents each year, resulting in the loss of over 180 lives and the damage amounting to 89 billion Mongolian tugrik. Nonetheless, the situation has not yet escalated to a 'serious' natural disaster as it has not caused significant environmental changes, impacted people's lifestyles, destroyed values, or resulted in mass casualties (National Emergency Management Agency of Mongolia, 2023).

Hazards Profile

In our research, we have identified four hazards and disasters that could potentially harm Mongolia's intangible cultural heritage (ICH). These hazards include drought, wildfire, earthquake, and *dzud*. Among these risks, we have highlighted *dzud* as the primary natural hazard that can have a significant impact on Mongolia's cultural identity. Our decision to focus on *dzud* is based on the data gathered from various sources, including the National Emergency Management Agency, the National Statistical Office database, and the Information and Research Institute of Meteorology,

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1   Registration and Information Department, National Center for Cultural Heritage, Mongolia
2   Director, National Center for Cultural Heritage, Mongolia
3   Preventive Conservation and Risk Study Department, National Center for Cultural Heritage, Mongolia

Hydrology and Environment.

Dzud is a meteorological occurrence in which severe winter storms ensue as temperatures plummet below -46°C. The phenomenon is typified by a dearth of summer rainfall and a rugged winter characterized by copious amounts of snow, leading to the death of a substantial number of livestock. Winter storms, in this context, are found to be associated with periods of drought, exacerbating the animals' susceptibility to harsh weather conditions. In addition, malnourishment can weaken herds, increasing the losses and reducing future productivity. It is important to note that the consequences of *dzud* can have significant economic and social implications, particularly in the areas where livestock serves as a primary source of income. Mongolians use the following five terms to distinguish different types of *dzud*, which are well recognized (Figure 1):

- *Tsagaan* **(white)** *dzud* results from high snowfall that prevents livestock from reaching the grass. It is a frequent and serious disaster that has caused a great number of deaths.
- *Khar* **(black)** *dzud* results from a lack of snowfall in grazing areas, leading to both livestock and humans lacking water. This type of *dzud* does not occur every year, nor does it affect large areas. It mostly happens in the Gobi Desert region.
- *Tumur* **(iron)** *dzud* results from a short wintertime warming, followed by a return to sub-freezing temperatures. The snow melts and then freezes again, producing an impenetrable ice-cover that prevents livestock from grazing.
- *Khuiten* **(cold)** *dzud* occurs when the temperature drops to very low levels for several days. The cold temperature and the strong winds prevent livestock from grazing; the animals have to use most of their energy to keep warm.
- *Khavsarsan* **(combined)** *dzud* is a combination of at least two of the above types of *dzud*.

Mongolia is vulnerable to frequent steppe fires caused mostly by human actions. Grasslands depend on seasonal fires for growth, but the current approach to fire-fighting is largely preventive, which endangers the stability of natural ecosystems. The

Figure 1
White *dzud* occurred in Khentii province, eastern region in Mongolia, 2023 (Photo: Eagle TV)

ecological systems are fragile, with low soil depth, making it susceptible to erosion. Climate change has worsened the situation, with increased heat and cold extremes, droughts, and reduced water availability, affecting the pastoral industry.

Approximately 35 percent of the Mongolian workforce depends on herding for a considerable portion of their livelihoods, while about 63 percent of rural households' assets are livestock. Livestock herding accounts for approximately one-third of the employment in Mongolia (National Statistic Office of Mongolia, 2022). The worsening of food security and the potential rise in poverty levels may prompt an increase in rural-to-urban migration. These risks are more likely to have an adverse impact on ICH.

It is improbable that natural disasters caused by severe hazards will significantly affect individuals living in sparsely populated areas who rely on livestock. However, the increasing frequency of natural disasters and global climate change necessitates the establishment of a disaster risk reduction plan within the ICH to prepare for, prevent, and respond to emergencies in the future.

GEOGRAPHICAL BACKGROUND OF EASTERN REGION OF MONGOLIA

Eastern Mongolia can be classified into two distinct regions. The northern region presents a magnificent taiga landscape with pine forests, rugged mountainous terrains, and robust rivers. Alternatively, the southern region marks the eastern periphery of the great Gobi Desert.

Eastern Mongolia is also famously known as the 'land of cranes' due to seven crane species, including some scarce, nesting by the rivers and lakes in the region during summer.

The vast grasslands of Dornod and Sukhbaatar provinces are a prime location for observing the migration of enormous herds of black-tailed gazelles seeking greener pastures.

The steppe landscape spans 860,000 km^2, with a sizable portion of the land being government-owned pasture used by approximately 20,000 nomadic herder families residing in small communities scattered across the eastern area. These pastoralists rely on the fragile steppe landscape and its numerous ecosystem services, from grass to water to wildlife.

OVERVIEW OF THE INTANGIBLE CULTURAL HERITAGE IN EASTERN MONGOLIA

Throughout history, the vast and boundless steppe of Eastern Mongolia has been the cherished home of multiple ethnic groups, including the Khalkha, Buryat, Zakhchin, Dariganga, Barga, and Uzemchin (Figure 2).

The never-ending expanse of the eastern Mongolian steppe is adorned with lush, feathery grass that sways gently in the breeze. The nomadic Mongols' unrelenting efforts to safeguard and preserve this unspoiled land for future generations signify

Figure 2 Map of eastern Mongolia, with the location of research areas (Khentii, Dornod, and Sukhbaatar provinces) (Source: Information and Research Institute of Meteorology, Hydrology and Environment)

their deep-rooted nomadic philosophy and profound understanding of nature. The nomadic philosophy of Mongolia is deeply rooted in a profound understanding and reverence for nature. It emphasizes the importance of living in harmony with the environment and has been passed down through generations of Mongolian nomads. This philosophy is based on the principles of sustainability, respect for nature, and an appreciation for the interconnectedness of all living things. The Mongolian nomads' way of life reflects a deep understanding of the natural world and how humans can coexist with it.

The Integrated State Database of Cultural Heritage of Mongolia reports 11,189 registered ICH practitioners, as well as 277 ICH registered elements. Notably, the eastern region, comprising the Khentii, Dornod, and Sukhbaatar provinces, only accounts for 1,561 registered ICH practitioners, representing a mere 14% of the total (National Center for Cultural Heritage of Mongolia, 2023).

We have selected the eastern region of Mongolia, which includes the provinces of Dornod, Khentii, and Sukhbaatar, based on the data we collected during the desk study conducted in 2021-2022. Our focus is on natural hazards such as *dzud*, heavy snow, drought, and wildfire in the context of disaster reduction and their relation to the ICH elements of various domains.

The ICH domains and elements we have identified are:
1. Social practices, rituals, and festive events:
    –   Mongolian nomadic rituals and customs
    –   Customs associated taboos
2. Traditional techniques, knowledge, and practices concerning nature and the universe:
   –   Traditional knowledge and practices of protecting and preserving nature

- Traditional knowledge and practices of observing and studying nature
- Traditional knowledge and practices of choosing new pasture
- Traditional knowledge and practices of observing and studying livestock
- Traditional astronomical knowledge
- Traditional knowledge and practices of naming places

3. Traditional knowledge and techniques:
- Traditional knowledge and techniques of preparing white (milk) dairy products
- Traditional knowledge, treatment, and medicine
- Traditional knowledge and methods of rearing and educating children
- Traditional knowledge of observing the sky and forecasting weather
- Traditional knowledge of observing plants and pasture
- Traditional knowledge of observing animals and birds

RESEARCH AREA AND METHODOLOGIES

The study aimed to examine natural disasters in Mongolia, specifically focusing on the *dzud*, a multifactorial natural hazard.

The research utilized the data from the National Emergency Management Agency and the Information and Research Institute of Meteorology, Hydrology and Environment to identify three natural hazards: drought, wildfire, and *dzud* (Figure 3-5).

The study focused on the ICH in Eastern Mongolia, which exhibited good grazing capacity during the summer of 2022. However, this region is in a high-risk area for wildfires, with some places having a moderate risk of *dzud*. Some areas may also experience little or no snowfall, resulting in black *dzud* that leads to livestock mortality due to a lack of water and reduced grazing capacity.
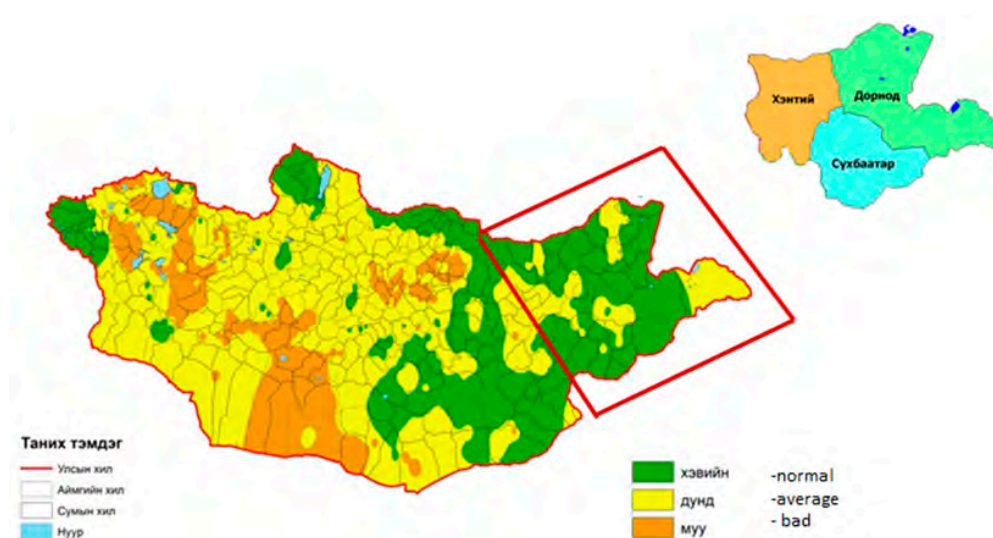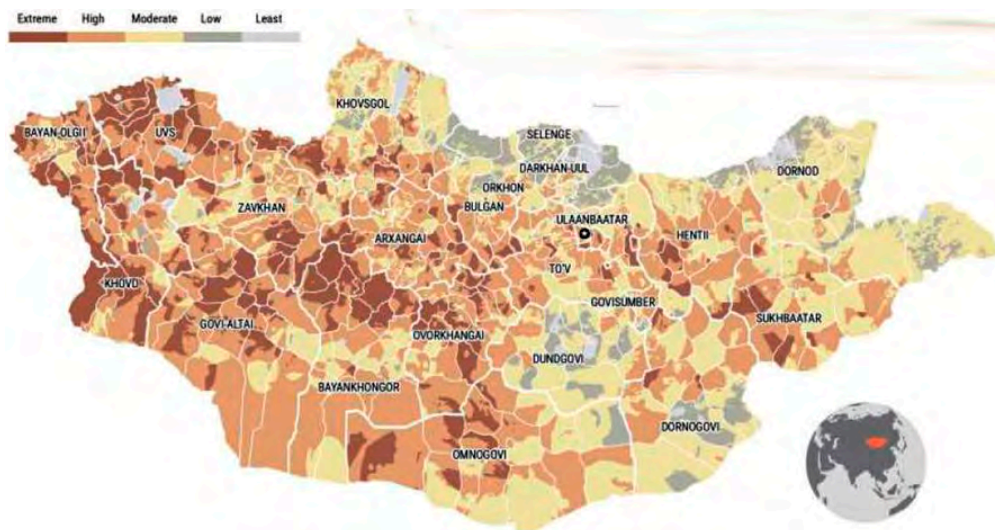

Figure 3 Drought and desertification map 2022 (Source: Information and Research Institute of Meteorology, Hydrology and Environment)
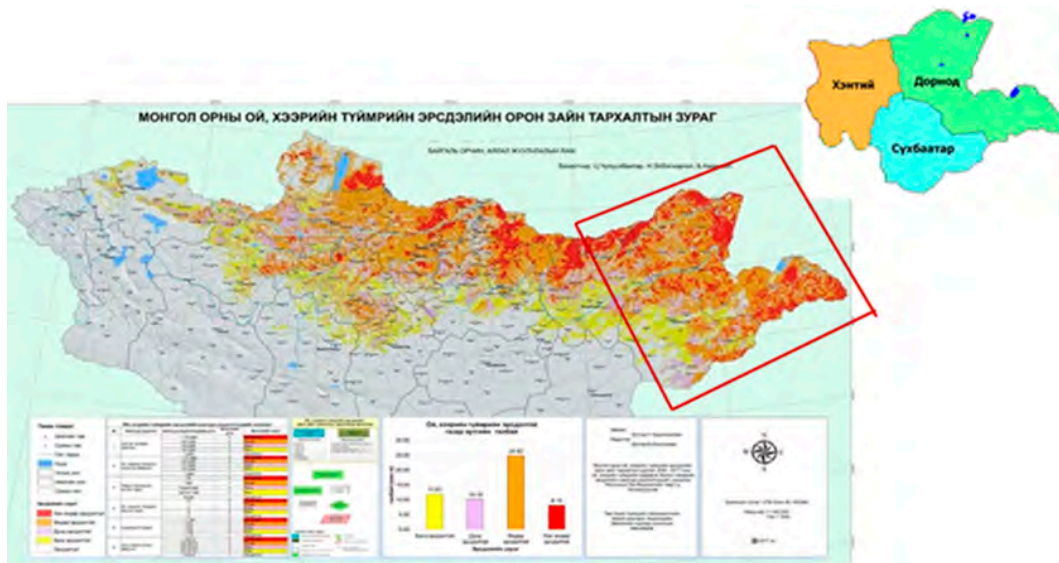
Figure 4 Wildfire, forest and steppe fires map 2022-2023 (Source: Information and Research Institute of Meteorology, Hydrology and Environment)

Figure 5 *Dzud* risk map as of 3 February, 2023 (Source: Information and Research Institute of Meteorology, Hydrology and Environment)

The study also aimed to assess the impact of natural disasters on the ICH in the eastern region. To achieve this, the research had three main objectives: firstly, to observe the types and frequencies of natural disasters in the study areas; secondly, to explore the community's traditions, customs, beliefs, culture, religion, and lifestyles within the study area; and finally, to assess the impact of natural disasters on the ICH of the study area.

The research was conducted extensively with local communities, including in-depth interviews with key informants and focus groups. Purposive sampling was leveraged to

carefully select areas that natural disasters, including wildfires, *dzud*, and droughts, have severely impacted.

The primary data collection method employed in this study was semi-structured interviews with herders and renowned practitioners of the ICH domains such as social practices, rituals, festive events, traditional techniques, knowledge and practices concerning nature and the universe, traditional knowledge and techniques, and traditional knowledge and techniques associated with herding livestock.

Interviewees were randomly selected from the Dornod, Khentii, and Sukhbaatar provinces. All interviewees were over 45 years old, native to the region, and had experienced several natural disasters. Semi-structured interview questions were utilized to explore aspects such as natural hazards and disasters, religion, beliefs, customs, traditions, and lifestyles of the locals.

ASSESSMENTS OF THE IMPACTS OF DISASTERS ON ICH

The herders in these regions possess extraordinary expertise in adapting to natural occurrences such as drought, wildfire, and the notoriously harsh *dzud*. Their herding lifestyle and traditional way of living have enabled them to amass a vast amount of knowledge and experience. They remain highly vigilant and constantly monitor weather forecasts from the Information and Research Institute of Meteorology, Hydrology and Environment, paying particular attention to the Malchin (Herders) TV. Moreover, they rely on their traditional knowledge to predict weather patterns by closely observing nature and their livestock. With such exhaustive preparation, they are always well-equipped to confront these phenomena head-on, minimizing the damages and ensuring their survival.

However, the impact of natural hazards on the environment cannot be disregarded. The country faces various effects due to climate change, such as drying up rivers and vast plains, melting glaciers and permafrost, and increasing dust storms and floods. These changes make it challenging to predict and forecast the weather, and recovering from disasters requires significant resources.

The country faces a persistent drought and harsh winter conditions, with dire consequences for livestock and herders. During the summer season, livestock typically benefit from the growth of pasture, grass, and crops, resulting in weight gain. However, in 2022, some regions' moisture deficits caused by drought have reduced livestock productivity and overgrazing due to the migration of pasture land. This has resulted in poor pasture quality, making it arduous for the animals to accumulate sufficient reserves. Furthermore, the thick snow cover and low temperatures during the winter pose a significant challenge for livestock accessing grazing grounds, resulting in death from hunger, exhaustion, and cold. Pregnant livestock are at risk of miscarriage or death, and young animals have a high likelihood of dying, particularly during the typical peak period of *dzud* from February to April. The impact and aftermath of the *dzud* devastate many herding households, often resulting in increased urban migration to cities such as Ulaanbaatar and the province center.

The elderly herders dwelling in rural areas have voiced their concerns about the natural hazards that have arisen due to climate change. They bemoan the impact of climate change on all the rivers, vast plains, glaciers, and permafrost. What were once flowery plains now teem with wormholes, and the skies, once clear, are now polluted. Climate change has triggered numerous changes in nature, both in Mongolia and worldwide. The light rains in summer and autumn that once provided coverage for the entire country have vanished altogether, and the increase in dust storms in spring and summer has led to a dearth of moisture.

The persistence of prolonged drought and severe winter events, or *dzuds*, can have debilitating consequences for livestock and pastoralists, necessitating extensive disaster recovery measures. Such interventions entail significant time and resource investments.

In the face of the combined disasters of drought and *dzud*, herders are confronting many challenges. These include:

- The deterioration of pasture and water supply, the need to move away from one's home, or pastoral winter migration to another land can be costly and difficult to find.
- The decrease in animal fat gain, yield, and quality and the falling prices of livestock and livestock products due to quality deterioration. The latter results in a significant reduction in the income of herders, affecting their ability to prepare for winterization and increasing losses due to poor winter-spring livestock.
- The availability of consumer goods becomes challenging, and the acquisition costs increase.
- Psychological stress and depression have become prevalent, increasing health and related costs.

Therefore, it is crucial to address these issues and provide sustainable solutions to mitigate the adverse effects of these challenges.

Numerous interviewees strongly believe ICH is critical in predicting natural phenomena and taking appropriate measures to mitigate their impact. The customs and traditions of Mongolian nomads represent a vast knowledge system that has been developed and passed down over generations. A range informs this system of factors, including geography, climate, herd structure, rituals, and symbolism. Mongolians closely observe all visible and audible signs to predict climate and natural changes.

Mongolian nomads have moved seasonally for centuries to allow nature to recover and prevent environmental risks like overgrazing and soil deterioration. They migrate with their herds across the four seasons, adapting to their surroundings based on the composition and distribution of their herds. These customs reflect the nomads' way of life and serve as a practical measure of natural phenomena.

For instance, they closely observe the sky and weather patterns, using sun signs rounded witch the circle like 'sun-stuffing' or 'three suns out' to predict snowfall and

harsh winter weather. In regions with camels, they even follow the direction in which the camel looked and laid on New Year's Day to predict good weather.

As the Mongolian saying goes, animals are an actual book to read the sky, and nomads use their behavior to predict and prepare for natural phenomena.

The loss of Mongolian traditional knowledge is a matter of grave concern, and it is crucial to ensure its uninterrupted transmission. Familiarizing future generations with traditional knowledge and spreading it is of paramount importance.

During the course of the interview, it was brought to attention that a comprehensive approach is required to mitigate potential risks in Mongolia. This approach should include:

– The evaluation of the livelihoods and disaster preparedness of herders,
– Precise selection and monitoring of drought and *dzud* risk indicators,
– Guaranteeing ample storage of forage to prepare for increased drought,
– Apprenticeship training for young herders regarding the traditional knowledge of observing Nature and herding.
– Efficient *otor* winter migration of herds, and
– Provision of veterinary services.

Moreover, it is recommended to incorporate traditional knowledge related to natural phenomena in disaster preparedness training. Emphasis should be placed on preventive measures to minimize the damage caused by heavy snowfall and cold weather. Additionally, proactive measures must be taken to mitigate the risks associated with environmental changes in Mongolia as a result of climate change, which can result in significant loss of livestock and crop stability.

CONCLUSION

Mongolia is one of the countries with the harshest climates in the world. Its summer lasts only two months, followed by a long winter with temperatures that can drop as low as minus 50 degrees Celsius.

Although natural disasters may not significantly impact Mongolians' living in sparsely populated areas with their livestock, global climate change and the frequency of natural phenomena such as *dzud* and drought are increasing daily.

The primary drivers of urban migration in Mongolia are the losses caused by *dzuds* and the subsequent loss of livelihood options. However, it is important to note that not all disasters have the same impact on the population. *Dzuds* are complex events that interact with various factors such as ecology, socio-economics, institutions, and physical characteristics.

Many studies have shown that families with a large number of animals are more resilient and recover more quickly due to their new births and the ability to sell, as well as being more mobile as they do not have to bear the cost of moving their herds.

On the other hand, small households cannot afford to increase their herd size to enhance personal resilience due to the high cost of fodder and their family needs. Consequently, low-income families are at risk of falling into poverty traps, facing disaster if their herd is lost, and are more likely to suffer from forced migration.

Notably, households following the pastoralist way of life have developed effective traditional methods and practices to cope with natural phenomena. These sustainable approaches enable these households to adapt to challenging environments.

According to historical data, it turns into a national-level disaster whenever *dzud* occurs in Mongolia with its pasture cattle breeding. The disastrous consequences of *dzud* have some definite relationship with the previous year's grassland yield. It is proved by much evidence that most disastrous *dzud* events mainly occur after a droughty summer-autumn period. If the summer is droughty and arid, the *dzud* should be expected to happen even if there is not so much snowfall in winter. If the grassland yield were sufficient in summer, the *dzud* conditions would not be formed even if much snow would fall in winter.

Establishing a disaster risk management program is of utmost importance in preparing for, preventing, and responding to emergencies. Furthermore, including ICH in disaster reduction and resilience is essential to mitigate the impact of natural hazards. This approach seeks to safeguard a community's cultural and societal components, which are often overlooked in disaster management. It is crucial to incorporate ICH into the disaster reduction and resilience planning process, as it allows for a comprehensive approach to disaster management that prioritizes the preservation of cultural heritage.

The field research team has developed recommendations for Mongolian official bodies and international organizations working in the intangible cultural field. These recommendations are as follows:
- Intensify research efforts on ICH and natural disasters. Conduct continuous field research to understand natural disaster risks and their impacts better.
- Include detailed disaster management regulations in sectorial laws to protect cultural heritage during disasters. Essential to consider the Law on the Protection of Cultural Heritage.
- Include the traditional knowledge in the disaster preparedness and mitigation training of the National Emergency Management Agency.
- Increase public awareness and promote traditional knowledge.
- Provide and strengthen social security for ICH practitioners.
- Implement specific measures that support ICH practitioners and communities during any disaster or risk.

REFERENCES

Information and Research Institute of Meteorology, Hydrology and Environment of Mongolia. (2023). Reports on Natural Disaster 2022-2023.

National Center for Cultural Heritage of Mongolia. (2023). Data from State Integrated Database of Cultural Heritage 2022-2023.

National Statistic Office of Mongolia. (2022). National Statistic Report 2022.

National Emergency Management Agency of Mongolia. (2022). Reports on Natural Disaster 2000-2020.