

Children and Climate Change

Children's vulnerability and their capacity as agents for community-based adaptation in Mongolia

Global climate change is already affecting Mongolia. It is putting poor and vulnerable children and their parents at risk of losing their lives and livelihoods. The predicted effects of climate change on Mongolia include an increased frequency of extreme weather and environmental hazards, such as flash floods, droughts, dust and snowstorms, torrential rains, heat waves and wild fires as well as unfavourable changes in precipitation patterns, the shifting in ecological zones and desertification.

In particular, climate change threatens the ability of children and their parents to access nutritious food, safe water and sustain their livelihoods in a safe environment. It is pervasive and its impacts are diverse, meaning that it can no longer be addressed by separate ad hoc interventions. Instead, its effects on the core development priorities must be continuously assessed and such assessment integrated into the design, monitoring and evaluation of programmes and policies.

The situation now requires that the country adapt to the realities that climate change is bringing and will bring – adaptation is now both a survival and a development issue. The impacts of a changing climate introduce new threats to children's well-being; the new risks and detrimental effects on their lives need to be calculated and redressed. Strengthening disaster risk reduction policies and their focus on children is particularly important and includes continuously assessing present and future hazards brought on by climatic changes.



Where the full extent of localized impacts is difficult to determine with certainty, building resilience at the household, community, local and national levels must remain an urgent priority. The capacity of local and national institutions to adjust, modify or change their practices to provide an enabling environment for sustainable livelihoods in a changing climate needs to be targeted.

The UNICEF East Asia and Pacific Regional Office commissioned a study of children's vulnerability to climate change and their role in adaptation efforts in Mongolia. The study is part of a regional series aiming to raise the otherwise low profile of children's needs and capacity in relation to the growing international policy focus on climate change issues. This extract paper highlights the findings contained in the comprehensive report.



Summary of observed climate change and effects in Mongolia:

- The mean air temperature has increased by 2.14°C over the past 70 years, with more intensified warming registered since the 1980s.
- Warming has been most pronounced in winter, with a mean temperature increase of 3.6°C; while spring, autumn and summer mean temperatures have risen by 1.8°C, 1.3°C and 0.5°C, respectively.
- Autumn and winter precipitation has increased by 4–9 per cent.
- Spring and summer precipitation has decreased by 7.5–10 per cent.
- Grassland has declined by 7 per cent and forest areas have declined by 26 per cent.
- Annual heat wave duration has increased by 8–18 days.
- Surface water has declined by 19 per cent since the 1970s.
- There has been a marked decline in high-nutrient pasture plant species.
- The frequency and aerial extent of the forest and steppe fires in Mongolia have significantly increased in the second half of the twentieth century as a consequence of a 17 per cent decline in spring precipitation and a rise in surface temperature.

Climate projections for the period 2020–2080 in Mongolia:

- Winter warming will be more pronounced than summer warming – up to 8.7°C increase by 2080, leading to more frequent icing up of pastures, creating a barrier to livestock grazing.
- Winter precipitation will increase by between 12.6 and 120 per cent.
- More intense and frequent snow storms will occur during the winter periods.
- Summers will be drier because a slight increase of summer rainfall (from 2.5 per cent decrease to 11.3 per cent increase) will be matched by a much higher predicted increase of evapotranspiration, 13–90 per cent, depending on the ecosystem region.
- Summer temperature increase will vary, from 1.3°C to 8.6°C.
- Climate change is expected to reduce aquifer recharge and water levels, especially in shallow aquifers, resulting in increasing water shortages.
- The speed and volume of thawing of snow cover in spring is projected to accelerate in western Mongolia, and the thawing time could advance, which may lead to more flash floods in the spring.
- More frequent droughts, extreme weather events and increased heat wave duration will occur, along with an increase in the areas affected.
- Delays in the onset of spring and greening of pastures are predicted.
- Productivity of grassland in the country is expected to decline, particularly in the Mongolian steppe where a 10–30 per cent decline is projected by the end of this century. A northward shift of agricultural zones is likely, resulting in an expansion of the steppe and desert steppe.

Sources: Batima, P. et al., 2005; Bayasgalan, B. et al., 2011; Dagvadorj, D. et al., 2009; IPCC, 2007; Gomboluudev et al., 2005; Ministry of Nature, Environment and Tourism, 2010.

Climate change-related risks to children in Mongolia

Decreased access to food. The level of food insecurity is already high among children in Mongolia. Currently, approximately 42 per cent of the Mongolian population relies on nomadic pastoralism as their main or sole livelihood strategy. Livestock are raised at open pasture, making them directly dependent on the climate and natural resource base. Climate change will lead to decreased and limited productivity of grasslands, water scarcity and more frequent extreme weather events. Seasonal food insecurity will be severely exacerbated by increasingly adverse weather and climate patterns. In the rural calendar, early spring is when food is most scarce and also when livestock are weakest and most vulnerable. With climate change, the onset of spring will become delayed. More frequent dzuds¹ caused by climate change will lead to the increased deaths of livestock, creating severe food shortages in spring.

Frequent livelihood shocks and increasingly uncertain availability of natural resources to sustain pastoral livelihoods will mean that food insecurity among vulnerable children and parents will increase with the following implications for children:

- Increased risk of infectious diseases leading to infant mortality as lowered immunity among children results from increasing food and micronutrient shortages.
- Increased risk of malnutrition, with potential increase in stunting. Children younger than five years old are particularly vulnerable to the effects of malnutrition since they are in a vital stage of development and lack of nutrients affects their lives and capacity in the long term.

Water scarcity. Despite a predicted increase in overall precipitation, the recharge of groundwater throughout the country will diminish with climate change. Sudden and heavy runoff events will be combined with a decreased level of precipitation in summer months, leading to overall drought and water shortages that will impact rural and

There is a strong relationship between food insecurity and livelihood shocks and stresses caused by climate change. This highlights the need to address the underlying causes of lack of access to food while considering how these causes will be affected by climate change. Food insecurity is a key cause of vulnerability to climate change and disasters.

urban areas. In the rural areas, subsistence pastoralists' livelihoods are highly sensitive to water availability.

In the peri-urban and rural areas alike, the risk of water scarcity will be exacerbated by the low capacity of the water sector and a lack of water infrastructure (Batimaa, 2010). In 2005, only 27.7 per cent of district schools and 16.1 per cent of district hospitals had an institutional drinking water supply and only 50 per cent of these could meet the standard for safe water quality (UNICEF, 2007). An increased prevalence of droughts and water scarcity will mean the following for vulnerable children:

- Increased risks to children's health from waterborne infectious diseases. The latest figures from the World Health Organization show that 14 per cent of deaths of children younger than 5 years in Mongolia are caused by diarrhoeal disease. The highest rates of incidence of dysentery and salmonella in recent years occurred between 2001 and 2003, coinciding with a very severe drought during which many springs and small rivers dried up throughout the country.
- Increased risk of food insecurity for children of pastoralist families as livestock are lost due to drought and water shortages.

Disasters. The occurrence of dzud and other climate-related disasters, including dust storms, droughts, flash floods and wild fires, will become more frequent with climate change, affecting children's vulnerability in the following ways:

- **Children increasingly engage in risky household-coping strategies**, such as livestock herding during snow blizzards and dust storms.

¹ Dzud: A Mongolian word for mass mortality of livestock resulting from a sequence of or single occurrences of weather and environmental extremes.

- **Protection and care for children can decrease** when parents and caregivers are under extreme stress during a disaster. This leads to increasing risks to children from a range of other hazards in the home and outdoors, including injury and sickness.
- **Psychological stress during disasters** has been observed among children in Mongolia and has often resulted in psychosocial trauma. A recent study by UNICEF revealed that 47 per cent of children in areas affected by the 2010 dzud displayed signs of psychological stress, characterized by expressions of disappointment, loss of self-confidence, nervousness and insomnia (UNICEF, 2007). Psychosocial stress can impair children's development.
- **More children drop out of school and some children are coerced to take up or choose child labour** out of necessity in the aftermath of climate-related disasters. Boys are particularly vulnerable and a particularly hazardous form of child labour is informal mining.

Isolation. Isolation in remote areas will increase due to the lack of road access when blizzards, snow cover and dangerous icing are expected to become more frequent. In the 2010 winter, 12,500 people were left stranded in remote areas; of them, nearly 5,000 were children, elderly people, people with disabilities and pregnant women (UN, 2010). They were left with no access to fuel supplies, medical services, medicines and facilities. For children, the isolation means:

- **Increased risk that infants will be delivered under unsafe conditions** because families are more likely to be cut off from health care facilities and increased stress will be placed on hospital fuel reserves and infrastructure.
- **Infants may die due to an increased prevalence and fatality of pneumonia, acute respiratory infections and other infectious diseases** without access to medical treatment.



Children making a disaster-preparation list in Tsetserleg soum

Children's roles in an adaptive society and children's capacity to contribute to the resilience of households and communities

In Mongolia, children are major contributors to household subsistence and livelihood activities. They have an excellent knowledge of their environment and a strong sense of responsibility and duty to their parents. They fill an important role in their household's preparation for adverse and hazardous conditions and in coping strategies during a disaster. Their practical skills and knowledge in doing so can and should be considered as a starting point for further adaptive capacity-building efforts by United Nations agencies, child-focused agencies, the Government and other actors.

Children have a right to genuinely participate in climate change adaptation efforts. There are many ways to empower children to share their ideas, learn from each other's experiences, form and express their opinions and then put their ideas into action. This is particularly important in assessing their own levels of climate risk, vulnerability and capacity, mapping hazards in their environment and making their views heard in policy dialogue on adaptation to climate change.

During the UNICEF study in Tsetserleg soum, in Arkhangai aimag, groups of young adolescents used pictorial diagrams to represent the necessities for preparing a Mongolian child for a climatic hazard. They demonstrated acute awareness of the practicalities of preparedness and the importance of early warning, compiling exhaustive lists during



Children holding up a map they have drawn of their living area, including sites affected by climatic hazards

discussions with their peers. Items depicted on their diagrams included: mobile phones to receive early warning messages or to alert emergency services of hazards; maps to identify the location of hazards and orient themselves to safety spots; and medical facilities and personnel and other human capital, including people to help with heavy tasks (such as the emergency slaughter of livestock or the strengthening of shelters). This exercise demonstrated the children's ability to think comprehensively and creatively about reducing risks.

Children in Mongolia can be instrumental in identifying risky environments and environmental problems as part of participatory adaptation planning. They can communicate this knowledge and ensure their perspectives and priorities are documented through tools, such as child community and hazards mapping.

Peri-urban Ulaanbaatar is an area identified as particularly vulnerable to climate hazards and food insecurity. For the UNICEF study, children in one of its poorest settlements, Chingeltei, were randomly selected from the streets to conduct a mapping exercise of their community, pointing out sites affected by climate change hazards. The children depicted areas that are immersed in water during spring and summer flash flooding. Throughout the exercise and without prompting, the children expressed requests and recommendations on actions they wanted taken to improve their living environment and safety in specific

problem locations identified on their maps. For instance, they noted that the playground they had depicted and other areas where children play are dangerous because they are prone to rockslides in the spring. The children expressed a wish for the playground to be relocated. Torrential rains and storms are major triggers for rockslide hazards, and these are predicted to become more frequent. The unplanned and overcrowded peri-urban settlements in Mongolia are particularly vulnerable to the impacts of heavier rainstorms.

"In springtime, rocks roll down onto the playground... One of my friends was injured by a rock... We want to have a playground where we can spend our free time... This playground is dangerous and not in a good place..."

A boy, 11 years old, in Chingeltei, Ulaanbaatar

"Big floods happen in this area and I have seen a ger² floating on the flood water. Strong winds destroy the fences around our ger, letting stray dogs wonder into our yard."

A boy, 10 years old, in Chingeltei, Ulaanbaatar

Continued overcrowding of urban areas due to climate change stresses in rural Mongolia will worsen the living conditions for peri-urban children without the adaptation responses needed urgently.

Rural children typically contribute heavily to household-coping strategies during disasters or other periods of hardship. It is important, however, to distinguish between coping measures and household adaptive capacity. The involvement of children in emergency coping strategies is more likely to increase their vulnerability rather than be indicative of their heightened capacity as agents for climate change adaptation.

Learning and adapting: Children have a greater capacity to learn and adapt to new things. In the context of climate change, children are well placed to drive forward shifts in behaviour that enable climate-resilient development.

² A ger is a traditional Mongolian mobile dwelling with a wooden frame and felt insulation walls that is typically used by pastoralists, who continue to use them after losing or abandoning their pastoral livelihood to resettle on the periphery of cities.

“At school, rural children worry a lot about their families back home when a dzud strikes. Many children need to take days off from school to travel back to the family camp to assist with care of the livestock. One boy from my school died while herding livestock in a winter blizzard when he was 15. His parents informed the teacher, who then informed my class.”

A girl, 16 years old, in Khotont soum, Arkhangai aimag

*“Rural children are more at risk to disaster than urban children because rural children herd cattle.”
“Many people live in very remote areas and have no transport other than horses, meaning they have no quick way to access hospitals in an emergency.”*

Excerpts from group discussions with adolescent schoolchildren in Tsetserleg soum, Arkhangai aimag

“In the last winter dzud, I took turns to herd our livestock...around 40 animals. I needed to dig the snow to help the livestock reach the grass, sometimes by hand. When there is a snow blizzard, I can't see my way and I'm afraid of getting lost. I'm also afraid of wolves. My cheeks and ears freeze and I get frostbite... This makes my ears very painful by the evening and liquid comes from my ears.”

A girl, 16 years old, in Khashaat soum, Arkhangai aimag

There is a lack of adaptive capacity at the household level, which means households are unable to prepare for, anticipate or react to a hazard with flexibility using physical, social or adult human capital. This then means children are more likely to become involved in emergency coping strategies, which typically increases their vulnerability.

“If a family has no way of receiving weather forecast information, they can be affected by a disaster. Rural children have less access to weather warnings. Disasters may cause parents' care for children to weaken.”

“Young children don't have knowledge about just how dangerous extreme weather conditions can be. If they do not have proper care, then they are more exposed to the dangers.”

Excerpts from a group discussion with adolescent schoolchildren in Tsetserleg soum, Arkhangai aimag



Children pointing out a flood-prone location during a walk in their neighbourhood in peri-urban Ulaanbaatar

Zavzandulam, 15 years old, milks her family's yak. In their remote pasture camp, she and her sister look after the livestock and their young brother when their parents travel to the regional town for up to two days at a time.



The terms 'coping' and 'adaptation' are sometimes used interchangeably, leading to confusion about the similarities and differences between these two important concepts.

Coping	Adaptation
<ul style="list-style-type: none"> • Short-term and immediate • Oriented towards survival • Not continuous • Motivated by crisis, reactive • Often degrades the resource base • Prompted by a lack of alternatives 	<ul style="list-style-type: none"> • Oriented towards longer-term livelihood security • A continuous process • Results are sustained • Uses resources efficiently and sustainably • Involves planning • Combines old and new strategies and knowledge • Focuses on finding alternatives
<p>Implications for children in Mongolia</p> <ul style="list-style-type: none"> • Children drop out of school in order to assist with household coping strategies. • Children are coerced into hard labour as a livelihood coping strategy, lose their right to leisure time and become exposed to a hazardous or unhealthy work environment. • Children are exposed to hazardous conditions when taking care of livestock; children have died while herding livestock during extreme climatic conditions. • Emergency coping strategies include tying children to furniture to restrain their movement in the absence of child care to ensure they don't burn themselves on the stove or stray outdoors while parents are busy with labour during a disaster. 	<p>Implications for children in Mongolia</p> <ul style="list-style-type: none"> • Children have a chance to be involved in planning for their future and in becoming agents for change. • Livelihood and food security for children are integrated into adaptation planning in a sustainable way. • Emphasis on future sustainability allows for inter-generational equity. • Continuous participatory learning and action for adaptation can ensure that parents and children take stock of new and innovative strategies in building their resilience to climatic hazards and adapting to a changed environment. • The longer-term nature of adaptation ensures that the capacities of children, parents and communities are built over time, thus balancing with the social and cultural specificities of remote, isolated or excluded children and adults.



Urgent action for child-centred climate change adaptation in Mongolia

The following are ways in which the United Nations in Mongolia, partner institutions and the Government can cooperate to reduce the vulnerability and enhance the adaptive capacity of the poorest and most vulnerable children and their families. The recommendations are in line with existing government priorities but emphasize a focus on children and the urgent need for climate change adaptation:

1. Ensure a coordinated effort for national disaster preparedness and disaster risk reduction

Key actors: National Emergency Management Agency (NEMA); UN Mongolia

Increase support to the Government and NEMA in the coordinating and managing of national disaster risk reduction and preparedness programming, including the strengthening of early warning systems and ensuring children's participation in the designing and implementing of local disaster risk reduction activities.

2. Climate-proof and retrofit schools, dormitories, hospitals, play areas, wells and infrastructure

Key actors: Government of Mongolia; UN Mongolia

This is an urgent priority in Mongolia. Infrastructure needs to be recovered, invested in and adapted to an increasingly severe and changing climate. The introduction of legislation on building codes might be a good way to ensure this practice is sustained.

3. Ensure genuine participation of children in climate change adaptation efforts

Key actors: UN Mongolia; child agencies in Mongolia; education professionals; local government staff; the National Authority for Children; Ministry of Education, Culture, and Science; NEMA; Aimag Children's Councils; children in and out of school in rural and peri-urban areas

Important activities include participatory contingency planning with children in schools and dormitories, encouraging children to monitor their own levels of risk and to become involved in community-based climate change adaptation. The participation of children who are typically excluded from information and even basic services should also be a focus. Awareness raising at all institutional levels is needed on the value of genuine children's participation in climate change adaptation and should also be a priority.

4. Support programmes that improve access to safe water and sanitation

Key actors: Ministry of Nature, Environment and Tourism (MNET); Mongolia Water Authority; international NGOs; UN Mongolia

Linking the targeted efforts of the MNET, the Mongolia Water Authority and other partners could ensure that adequate budget allocations and resources are available to increase investments in the water sector, with a focus on the peri-urban supply and reaching remote off-grid population centres. Initiatives could also engage authorities in drafting and strengthening action plans under the new Integrated Water Resources Management Plan (national) and Integrated Urban Water Management Plan (Orkhon-Tuul river basin), helping to ensure that various actors are engaged and that hospitals, schools and domestic use are prioritized in water sector plans. UNICEF can help identify urban communities that are and will be most affected by shortages in water supply and propose short-, medium- and long-term solutions to help ensure that essential needs are met.

5. Addressing access to food and proper nutrition

Key actors: Ministry of Food, Agriculture and Light Industry; Ministry of Social Welfare and Labour; World Bank; UN Mongolia; grass-roots herder institutions; rural and peri-urban vulnerable households; vulnerable adolescents and youths

Interventions include livelihood diversification assistance, vocational skills training and awareness raising on proper nutrition for growing children and pregnant women.

Valuing the roles of children in adaptation processes and acknowledging the contributions they already make to household and community resilience and what they are capable of is essential.

Both adults and children need to realize, respect and protect children's agency for adaptation. Children's perspectives derived from direct dialogue and participatory research can and should be integrated into national adaptation policies and programmes, thus enabling them to genuinely participate in the political spheres of influence.

6. Integrating climate change into policy documents relating to children

Key actor: Government of Mongolia

Ensure that major national strategy and policy documents relating to children, such as the National Plan of Action for the Development and Protection of Children 2002–2010 and the National Report of the World Fit for Children Plan of Action: A Mongolia Fit for Children 2006, include an assessment of the climate change-related risks to the priorities, explicitly address climate change and have been reviewed for climate sensitivity and resilience.

7. Educate all children in remote areas

Key actors: Ministry of Education, Culture and Science; UN Mongolia; child-focused agencies

Continue the support to mobile education programmes to ensure access to information and the socialization of children in remote areas, enabling them to express their opinions and to act on adaptation to climate change.

8. Provide sustainable solutions for energy supply to households and children's facilities

Key actors: Ministry of Fuel and Energy; UN Mongolia

The increasing frequency of dzuds due to climate change will lead to increased pressure on fuel supplies for households. This may lead to an increase in the use of low-quality solid fuels, which are one of the leading causes of morbidity among children in Mongolia when used indoors for heating and cooking. Sustainable solutions to this problem should focus on reduced fuel and energy expenditure by poor households and on healthier solutions for domestic heating and cooking fuel and electricity supply. Such solutions would be in line with Mongolia's National Renewable Energy Programme. Work with the Government should ensure that schools and hospitals are priority targets. The Global Alliance for Clean Cookstoves may be a source for lessons of good practice and possible partnerships for similar initiatives in Mongolia.

9. Protecting the existence and functioning of markets, including in remote areas, and supporting private enterprise to improve market outcomes for the benefit of subsistence pastoralists.

Key actors: Ministry of Finance; Ministry of Food, Agriculture and Light Industry; UN Mongolia; international donor agencies; grass-roots herder institutions

Identify measures for local and central Government to promote markets, the national distribution of goods and storage, and year-round supplies, especially for emergency and seasonal fodder stocks; improve the rapid destocking capacity (reducing the number of livestock). This would increase livelihood security among subsistence pastoralists who are vulnerable to the effects of climate change. Sustainable markets would also facilitate a better supply of food to urban areas and a more varied supply of food to remote rural areas.

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Author: Preslava Nenova-Knight

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Design and layout: Quo Keen (www.quo-global.com), Bangkok, Thailand

UNICEF East Asia and Pacific Regional Office

19 Phra Atit Road

Bangkok 10200 Thailand

Tel: (66 2) 356-9499

Fax: (66 2) 280-3563

E-mail: eapro@unicef.org

www.unicef.org/eapro