

## Winter Storms and Extreme Cold Weather Events

A guide to livestock-based emergency preparedness, response and recovery

Christine C. Jost with Batjargal Erdenebaatar



## **CONTENTS**

Аси	ronyms	2
1.	Introduction	3
2.	Livestock livelihoods and the impacts of severe winter weather	3
Cen	ntral and East Asia	3
The	e Himalayas	4
Sou	th Asia	4
Wir	nter storm impacts on livestock-keeping households	4
3.	Introduction to the LEGS Handbook	5
4.	The LEGS planning tools	6
Stag	ge 1 – initial assessment	6
Stag	ge 2 – response identification	8
Stag	ge 3 – analysis of interventions and options	9
Stag	ge 4 – response plan	11
5.	Supporting food security and nutrition	12
6.	Preparedness and risk reduction	12
7.	Good practices and things to remember	13
Ann extr	nex 1: Examples of livestock-based interventions for slow-onset severe winters and reme cold weather events	14
Mor	ngolia case study	17
Afgł	hanistan case study	17
Nep	pal case study	17
Refe	erences	18

#### ACRONYMS

AHSP	Animal health service provider	GBV	Gender-based violence
CVA	Cash and Voucher Assistance	LEGS	Livestock Emergency Guidelines and Standards
DRR	Disaster Risk Reduction	NEMA	National Emergency Management Agency,
EWS	Early Warning System		Mongolia
FAO	Food and Agriculture Organization	PRIM	Participatory Response Identification Matrix
	of the United Nations	PVP	Private veterinary pharmacy
FMD	Foot and mouth disease	SMS	Short Message Service

## **1. Introduction**

This Technical Brief focuses on the application of the Livestock Emergency Guidelines and Standards (LEGS) in the context of winter storms and extreme cold weather events in Asia. The brief provides users with knowledge and good practices in response planning and delivery for livestock-dependent communities in Asia that experience emergencies due to winter and extreme cold weather. It also provides LEGSbased good practice guidance to support better preparedness and response and help safeguard livestock livelihoods. Although documented evidence exists of LEGS being used to prepare for winter storms and extreme cold weather events in Mongolia (14), there is limited documentation for other Asian countries that experience these weather conditions. Throughout the brief, past responses are used to explore how LEGS can be used to support future responses to such events.

## 2. Livestock livelihoods and the impacts of severe winter weather

In the cold and mountainous areas of Asia, rural livelihoods often depend on keeping livestock for food and income because harsh conditions limit other types of agricultural activities.

## **Central and East Asia**

In Mongolia, 75% of the land is high pasture or 'steppe', and 35% of the population are nomadic herders (31). Mongolian livestock are well adapted to cold winter conditions. The Mongolian word for severe winter is 'dzud', which usually occurs when a summer drought resulting in poor pasture production is followed by heavy snow and extreme cold, leading to insufficient fodder for grazing livestock. There are four main types of dzud. A 'white dzud' deep snow prevents camels, cattle, yaks, goats, sheep and horses from using their hooves and snouts to dig through the snow to reach dry grass on pastures; in a 'black dzud', pastures that are already denuded of grass because of summer drought suffer from a lack of snow, leaving the bare pastures looking black; an 'iron dzud' occurs when a short thaw followed by freezing temperatures locks pastures under ice; a 'cold dzud' occurs when winter temperatures are colder than normal for a prolonged period of time, causing animals to burn through their fat reserves too quickly (18). Historically, livestock production in other Central Asian countries like Kazakhstan was also primarily nomadic pastoralism. However, economic development and agricultural diversification has led to a sedentary, industrializing livestock sector that is relatively immune to severe winters on the Kazakh steppe.



### The Himalayas

Livestock play a vital role for sedentary farmers and herders alike in the Himalayas. In Nepal, nearly 80% of households own livestock (24). Mid-hill farmers grow cereals, pulses and vegetables supported by livestock such as buffalo, cattle, sheep, goats and poultry that provide fertilizer and traction for farming and highnutrient foods and income for families. In the high hills, livelihoods become mostly if not fully dependent on goats, sheep and yak for food, wool, transport and income. Transhumance is common, with herders moving livestock to rich highland pastures in the summer and back down to the homestead for the winter. In the highest, remote districts of Nepal and Tibet where there are no roads, yaks are used as pack animals that provide the only means of transport for goods, particularly in the winter. Similar to the cold dzud, cold waves in the Himalayas can cause livestock to lose condition very quickly, while heavy snowfall can bury local pastures and trigger avalanches. As the snows melt, flooding and landslides can occur.

## South Asia

The northern areas of Afghanistan experience winter conditions similar to *dzuds* and affect sedentary farmers keeping cattle, sheep and goats as well as Kuchi nomads who also keep camels. Livelihoods in mountainous areas of Pakistan and Afghanistan are dominated by transhumant livestock keeping and experience similar conditions and hazards as the Himalayas (6). In Afghanistan, insecurity and conflict can prevent households from moving their animals to high pastures, resulting in poor nutrition that makes them more vulnerable to severe winters.

## Winter storm impacts on livestockkeeping households

In addition to causing animals to die, winter storms and extreme cold weather events can impact livestockkeeping households in a variety of ways. When drought occurs, animals will consume less and thereby enter winter in a poor state of nutrition. Harsh winter weather can damage or destroy feed stores and vital infrastructure like livestock shelters, water points and roads. Injuries and diseases also increase during severe winters. For example, weak livestock can be injured around their feet and mouths trying to access grazing under snow and ice, rendering them unable to eat sufficiently or migrate. Concentration of livestock on the few remaining pastures and at the water points increases the spread of infectious diseases such as sheep and goat pox, and their congregation in poorly ventilated shelters causes diseases like pneumonia to set in. When diseases occur, the productivity of livestock declines and families lose food and income. Herders may be forced to migrate far from home in search of feed and water, and so families may not be able to sell animals to meet income needs. Feed prices increase, while prices for animals in poor condition decrease. Because they may be farther from home and service providers cannot access them during severe weather, households experience difficulties in accessing livestock inputs and services. The welfare of the household may also be impacted as families lack the cash to buy basic necessities such as heating fuel and food, and the loss of animals means that fresh livestock-derived foods that are rich in energy, protein and micronutrients are unavailable when household members have to perform labour-intensive winter work. Households can sink into food insecurity and the vulnerable members, especially the elderly, children, and pregnant and lactating women, can become malnourished.

Many factors are worsening the impacts of winter storms and extreme cold weather events, such as population growth and increasing demand for meat, which are driving increasing livestock population numbers. This in turn exacerbates overgrazing and pasture degradation. However, the most important factor is climate change, which is worsening summer droughts, shifting the timing of precipitation, and increasing the severity and frequency of extreme events like cold spells and snowfall.

For example, in Mongolia the severity and frequency of climate-related natural disasters have doubled, costing the country USD14–20 million per year (22). Average temperatures have risen by 2.46C over the past 80 years, a rate of increase twice as fast as the global average (31). At the same time, the severity and frequency of dzuds are increasing. While there haven't been studies on the linkages between more frequent and severe dzuds and climate change (21), dzuds used to be once-in-a-decade events, but there have been five in the past 10 years (26). In Pakistan, severe winter events are becoming more extreme and are occurring more frequently, particularly extreme cold weather events such as the extreme snowfall that struck Muree in the Punjab region in 2022, stranding 1,000 vehicles in which 22 people died (1). Winters are also becoming shorter in Pakistan, reducing the amount of snowfall in the north that provides water for crops during the growing season (27).

In addition to the direct impacts of winter storms and extreme cold weather events, in cold and mountainous areas the impacts of natural disasters such as earthquakes and flooding that occur during winter or from which households have not recovered before winter strikes can be magnified and longer lasting.

In the long term, livestock keepers can enter a boomand-bust cycle that forces them to focus on animal numbers rather than increasing the productivity of their livestock as a pathway out of poverty. This can worsen pasture degradation and reduce the availability of natural resources vital to livestock livelihoods. Families can fall into poverty traps as they take out loans to survive and recover from winter emergencies, loans that they can't pay back before the next emergency occurs. With repeated shocks, families may no longer be able to maintain their livelihoods, leading to rapid urbanization and growth in city slums such as the ger districts of Ulaan Baatar in Mongolia (30). The impacts may disproportionately affect women and children, who can face increased household labour as men migrate in search of work, increasing rates of gender-based violence (GBV), and have less opportunities to attend school.

### 3. Introduction to the LEGS Handbook

The Livestock Emergency Guidelines and Standards (LEGS) Handbook provides guidance to humanitarian actors responding to emergencies impacting the livelihoods of livestock keepers (13). LEGS supports

the decision-making process, from assessment to planning to monitoring and evaluation. As a member of the Humanitarian Standards Partnership (12), LEGS is based on eight principles (Chapter 2, page 46) that are complementary to the Sphere foundations (28) and support the Core Humanitarian Standard Commitments (4).

The LEGS planning process is based on three livelihoods objectives (Chapter 1, page 20):

- To obtain immediate benefits from using existing livestock assets
- To protect key livestock assets
- To rebuild key livestock assets

When using LEGS, livestock communities, local governments and organisations, and humanitarian actors identify livelihood objectives for their responses and assess technical interventions against those objectives. The LEGS process includes six technical interventions that can be implemented during a winter emergency:

- Provision of feed (Chapter 4)
- Provision of water (Chapter 5)
- Veterinary support (Chapter 6)
- Shelter and settlement (Chapter 7)
- Livestock offtake (Chapter 8)
- Provision of livestock (Chapter 9)

See Table 1 for a few examples of technical interventions for emergencies caused by winter storms and how they help to support the LEGS objectives.

LEGS livelihoods objective **Example LEGS interventions** Livestock offtake: When winters may be severe, livestock keepers may need To obtain immediate benefits assistance to access markets and sell some non-breeding animals to obtain income from using existing livestock that can be used to support the core breeding stock. assets Water: Immediately after a deep freeze it may be necessary to unblock and repair critical water points for livestock. Feed: During severe winters, pastures and stored feed may run out and it may be To protect key livestock assets necessary to provide livestock keepers with feed. Shelter: Livestock keepers can be helped to build or repair their shelter when a severe winter is expected, when a storm has damaged existing shelter, or when they are displaced and cannot access their normal shelter. Veterinary support: As livestock keepers are recovering from a severe winter, it is To rebuild key livestock assets important that they have access to animal health services to protect animals that have survived and to make sure newborns are thriving. Provision of livestock: Some livestock keepers may have lost so many animals they can't recover without new animals for their herd.

 Table 1. The three LEGS livelihood objectives and examples of related LEGS technical interventions

## 4. The LEGS planning tools

Most often winter emergencies are slow onset, such as a dzud in Mongolia, with early warnings before severe winter weather sets in. During the normal phase, livestock keepers are carrying out their usual spring and summer production activities. During the alert phase, livestock keepers may take note of sub-optimal production conditions such as drought that may leave them less prepared for winter. There may also be early warnings of a severe winter ahead issued by national meteorological services and disaster management authorities. During the alarm phase, severe winter conditions have set in, and livestock keepers experience initial impacts such as livestock losses and poor animal/ feed terms of trade due to feed scarcity and high market prices. They may begin migrating to areas beyond their normal route in search of feed and water for their livestock. During the emergency phase, keepers may no longer be able to access inputs such as veterinary care and feed, and livestock losses become so large keepers may not be able to recover without assistance. During the recovery phase, livestock keepers are focused on rebuilding their livelihoods.



However, some winter emergencies are rapid onset. They involve an unanticipated event that has humanitarian consequences during an otherwise normal winter, such as a snow avalanche in the Himalayas that, in addition to direct human consequences, kills animals, destroys shelter and stored feed, and damages critical infrastructure such as roads, markets and water points. In this case, communities can go from the normal phase to the immediate aftermath within hours. Following initial efforts to save people's lives and alleviate suffering, activities to support livestock-keeping communities will focus on meeting the survival needs of the remaining animals. In the early recovery phase, the focus shifts to the immediate needs of livestock keepers as they rebuild, and then longer-term support during the recovery phase focuses on helping livestock keepers build back to their previous livelihoods and aims to increase their resilience.

There are also winter emergencies where an initial shock such as the earthquake that occurred in November 2023 in Nepal's Karnali Province (see case study 3) has immediate impacts such as animal losses and damage to livestock infrastructure, in which the timing of the disaster leaves people and their remaining animals vulnerable to winter conditions that they would typically be resilient against. No matter the type of emergency, the LEGS Handbook includes tools that support the planning process in four stages.

## Stage 1 – initial assessment (Chapter 3, pages 79–86)

In most cases, local governments and communities affected by severe winters will carry out their own impact assessments of the emergency. If an assessment is being led by humanitarian actors, it is important that those directly impacted by the emergency participate in design, implementation and analysis of the results. The LEGS Assessment Checklists help affected communities and humanitarian actors understand the type, phase, severity and context of a winter emergency, and gather information needed for response planning. See Table 2 for some specific points to remember when using the LEGS Assessment Checklists to capture the impacts of winter storms and extreme cold weather events in livestock-keeping communities.

<sup>1</sup> LEGS defines the following five phases for slow-onset emergencies: 'normal' when there is no emergency, 'alert' when it is first recognized that a shock such as a *dzud* may occur, 'alarm' when a shock begins, 'emergency' when the greatest impacts of the shock are felt, and 'recovery' after a shock has resolved and livestock keepers rebuild their livestock assets.

<sup>2</sup> LEGS defines the following four phases for rapid-onset emergencies: 'normal' when there is no emergency, 'immediate aftermath' right after a shock such as an earthquake has occurred, 'early recovery' after the shock has passed and livestock keepers focus on their animals' immediate needs, and 'recovery' when livestock keepers rebuild their livestock assets.

When preparing for an assessment, the first step is to gather and review existing information (LEGS page 80). Government offices and local organisations will likely have information such as the types and number of livestock kept in the area, production practices, norms related to culture and gender, locations of communities and homes, and migration routes. Many local governments have disaster preparedness plans that can provide information such as what types of winter hazards occur in the area, the types of impacts that occur, vulnerable households, location of infrastructure, and contact information for local leaders and organisations. There may also be secondary data available from statistics offices, veterinary departments, and maps. The three LEGS Assessment Checklists (LEGS pages 82– 86) are composed of open-ended questions that guide assessment teams in gathering information and deciding if a humanitarian response is needed. They are designed to be participatory, flexible and completed rapidly so that, if the assessment finds that a response is necessary, it can happen as soon as possible. The three checklists cover:

- Checklist 1: The role of livestock in livelihoods (page 82)
- Checklist 2: Nature and impact of the emergency (page 83)
- Checklist 3: Situation analysis (page 85)

Checklist	Point
1: The role of livestock in livelihoods	<ol> <li>In Central and East Asia, the Himalayas and South Asia, there are often other sources of income in addition to livestock, such as remittances, trading, crafts etc., and these may also be affected by a severe winter event, or may provide sufficient cushion to carry a community through without outside intervention.</li> <li>A household's animals can support a family's survival in many different ways, including transport for critical winter necessities such as feed for the herd, providing high-energy and nutrient-dense foods, and providing hides and wool for shelters for people and animals.</li> <li>It is important to pay attention to the different customary roles in a household, particularly those of women and children, including non-livestock responsibilities such as going to school and earning an income from petty trade.</li> <li>Most livestock-keeping communities have indigenous practices to reduce their vulnerability to winter storms and cold weather events. These should be well documented and used as the foundation for emergency responses so that these mechanisms are supported rather than replaced.</li> </ol>
2: Nature and impact of the emergency	<ol> <li>In places where severe winters are common, households and local governments will often have contingencies in place to mitigate the impact of a shock. In Mongolia, herders stock hay and feed for the winter, and local governments are required to maintain a central stock that can be distributed during an emergency. It is important to document the differential effects of winter emergencies on different types of livestock and households—larger stock kept outdoors may be more affected by a sudden freeze than small stock kept tightly concentrated in a shelter; hay stockpiles or shelters can be damaged.</li> <li>A winter emergency can impact members of a household differently, particularly when the household is split because men and boys have migrated with the bulk of the herd in search of feed, water and shelter. It is important to pay particular attention to the impact of a winter emergency on women and girls when added stress can lead to increased levels of GBV, and children who may have leave school when cut off by winter conditions (34).</li> </ol>
3: Situation analysis	<b>1.</b> Winter emergencies can make it difficult to access livestock-keeping communities. Local governments and actors like non-governmental organisations (NGOs) and livestock associations are often familiar with the local context such as where it is too dangerous to travel and what communities may be cut off. They may also be able to contact communities remotely via cell phone and radio.

**Table 2.** Points to remember when assessing the impacts of winter storms and cold weather events

<sup>3</sup> The new LEGS/ SEADS (Standards for Supporting Crop-related Livelihoods in Emergencies) Joint Assessment Tool can be used to assess the impact of emergencies in communities such as the mid-hills of Nepal and the north of Afghanistan whose livelihoods include both crop agriculture and livestock.

## Stage 2 – response identification (Chapter 3, pages 87–90)

Should a livestock-based response be necessary, the LEGS Participatory Response Identification Matrix (PRIM) tool helps to identify which of the six technical interventions would be most relevant and timely based on the livelihood objective(s) for the response. The PRIM is designed to be used in a workshop-like setting so that the planning process is participatory and involves affected communities, experts and responders alike. When completing the PRIM, workshop participants use the information gathered during the initial assessment to make their decisions.

Between 31st December 2019 and 13th January 2020, snowfall, avalanches and heavy rain occurred in the Pakistani province of Baluchistan and Pakistanadministered Kashmir. The emergency affected 1.7 million people and led to 107 deaths. There is no information available on the use of LEGS during this emergency, but Table 3 provides an example of results that can be obtained using a PRIM to identify technical interventions for a hypothetical response to heavy snowfall and avalanches like those that occurred in Pakistan. The Food and Agriculture Organization of the United Nations (FAO) responded to this emergency during the recovery phase by distributing poultry to highly vulnerable affected households, providing government veterinary centers with medicine and equipment, and supporting curative and preventative veterinary services (35). Other partners, such as the Islamic Relief Fund, met immediate humanitarian needs with cash and non-food items such as soap and medicines (11). The benefit of the PRIM process is that it allows communities and supporting partners to identify interventions that they might not have thought of at first glance. In the Pakistan example, the affected communities may have also benefited from the provision of livestock feed and water early on in the emergency. Then during the recovery phase, communities may have benefited from support to strengthen indigenous household hay storage structures so that they could build back better after the emergency.

	Scoring against LEGS livelihood objectives			Appropriate timing for intervention		
TECHNICAL INTERVENTIONS	Immediate benefits	Protect assets	Rebuild assets	Immediate aftermath	Early recovery	Recovery
Feed	0	1	1	~	~	~
Water	0	1	1	~	~	~
Veterinary support	1	3	3	~	~	~
Shelter	0	0	0			
Livestock offtake	0	0	0			
Provision of livestock	0	0	3			~

**Table 3:** Hypothetical results from a rapid-onset PRIM workshop to identify technical interventions for a livestock-based response to the 2020 heavy snowfall and avalanches in mountainous Baluchistan, Pakistan

As set out in Table 3, cold weather events can pose unique challenges in terms of access, making it impossible or very challenging for affected communities and local organisations to attend a PRIM workshop. Where connectivity allows, video conferencing can help overcome such challenges. When this is not possible, an alternative approach can be calling key stakeholders prior to the workshop to solicit their input and then reporting on the calls during workshop deliberations.



# Stage 3 – analysis of interventions and options (Chapter 3, pages 90–95)

Once the technical interventions have been identified, the tools available in Stage 3 allow communities, local organisations and humanitarian actors to identify specific options for each intervention so that its design and implementation will be appropriate, feasible and timely. The five tools to support this decision-making process are found in the technical standards chapters of the LEGS Handbook and are also explained in Chapter 3: Emergency Response Planning. See Table 4 for a hypothetical example of using the Stage 3 tools to analyze the provision of fodder in response to the Mongolian *dzud* of 2024. **Table 4.** Hypothetical use of the LEGS Stage 3 tools to plan a feed response to the 2024 dzud in Mongolia, based on the United Nation's Dzud Early Action and Response Plan (December 2023–May 2024) (22)

LEGS Stage 3 tools	Decision process	Decision result	
Tool 1: Outline of options (pages 138–139)	When providing households with feed to support their livestock during an emergency, responders can choose from two options: home-based emergency feeding or feed camp emergency feeding.	Home-based emergency feeding	
Tool 2: Benefits and challenges table (pages 140–141)	During the winter in Mongolia, herders are widely distributed in their winter locations, and during a <i>dzud</i> herders may go far in search of resources for their animals. This makes feeding in camps impractical. There are benefits and challenges to distributing feed directly to <i>dzud</i> - affected households. Herders maintain management of their livestock, but there are costs and logistical challenges of getting feed to herders in remote locations. However, all herder families have their own means of motorized transport and can pick up their feed from drop-off points or use cash/vouchers to buy feed in the market as long as roads have been cleared.		
Tool 3: Timing table (page 142)	A <i>dzud</i> is a slow-onset emergency for which early warnings are issued weeks or months in advance. The greatest benefit from feed distribution is achieved during the alarm phase when a <i>dzud</i> has begun to set in and a family's feed supplies are almost used up but before animals lose too much condition and roads are blocked by snowfall. Feed provision should continue through the emergency phase.	Feed provision during the alert and alarm phases from January through May	



LEGS Stage 3 tools	Decision process	Decision result
Tool 4: Decision tree (pages 149–150)	To confirm the above decision, communities and responders can work through the decision tree for livestock feed options and, if appropriate, develop a response plan. Feed can be sourced from the productive eastern provinces, and moved to central and western provinces. The plan calls for targeting the neediest households, including those that are women-headed and from marginalized communities. Local suppliers and transporters can be contracted to provide and move the feed, which can be stored in district government facilities. Voucher-based distribution is not common in Mongolia, and herders are used to picking up feed from central stores. For herders who are snowed or iced in, roads will be plowed and maintained to allow for their safe movement.	Home-based emergency feeding confirmed
Tool 5: Standards and guidelines (pages 151–160)	<ul> <li>There are four technical standards that need to be considered for livestock feed:</li> <li><b>1.</b> Preparedness: As mentioned above, hay is commonly transported to and stored in the feed-deficit central and western provinces. These stocks will be assessed to determine if additional feed should be procured, identifying local and national sources if necessary, without disrupting the market. Distribution will be managed jointly by local governments and herder associations.</li> <li><b>2.</b> Assessment and planning: Providing feed is expensive, so only core breeding stock in each household will be targeted for feeding. The provision of feed will be linked to the provision of cash assistance so that households can also purchase food and other necessities for the family.</li> <li><b>3.</b> Feed levels: Feed types and levels can be determined using FAO's Livestock-Related Interventions During Emergencies Manual, Annexes 3A and 3B, respectively (9). Large stocks of feed have been stored by the national and local government as well as the private sector, and market disruptions are not expected.</li> <li><b>4.</b> Feed safety: There are sanitary, phytosanitary and contaminant risks associated with the movement of feed. For example, trucks used to transport the feed can be contaminated by residues from other materials; seeds from invasive species may be present in hay; hay may be contaminated with pathogens from diseases like foot and mouth disease (FMD). Trucks will be thoroughly cleaned before use.</li> </ul>	

#### Stage 4 – response plan (Chapter 4, pages 96–98)

At this point, local governments, communities and humanitarian actors have all the information they need to develop their response plan. The LEGS Handbook provides a response plan template (page 124) that captures top-level elements of the plan, including the theory of change and the monitoring, evaluation, accountability and learning plan (MEAL). In Mongolia, Mercy Corps and World Vision have worked with the National Emergency Management Authority (NEMA) to adapt the national 'disaster protection plan template' used by local governments. The template is now based on the six LEGS technical interventions. Mercy Corps also trained local governments to use the new LEGSbased templates to develop their winter preparedness plans (17). The plan is used to identify the most critical investments for the year to reduce disaster risk, and before winter sets in the plan is reviewed and updated.

See Annex 1 for a detailed list of recommended livestock-based interventions that could be planned in response to a winter event. FAO's Livestock-Related Interventions During Emergencies (The How-To-Do It Manual) (9), which complements the LEGS Handbook, provides detailed technical guidance for each LEGS intervention.

<sup>4</sup> Outbreaks of FMD can start in the autumn and early winter season in Mongolia associated with the movement of contaminated hay, resulting in the imposition of strict quarantine zones by government veterinary services that impacts herder's livelihoods, income generation and food security.

# 5. Supporting food security and nutrition

Because of the impacts of winter storms and extreme cold weather events, it is important that livestockrelated humanitarian responses support household food security and nutrition and as well as livestock livelihoods. Some ideas for supporting household food security and nutrition are:

- Whenever possible, provide food-insecure households with cash rather than or in addition to in-kind assistance so that they have the flexibility to prioritize what they buy (23) (33) (see the LEGS Handbook page 119 for a table showing response modalities for LEGS technical interventions and options). The 2024 *Dzud* Early Action and Emergency Response Plan for Mongolia identified cash as an urgent humanitarian need for herder households (22).
- In summertime, support nutritionally vulnerable households with poultry, beekeeping and other diversified livelihoods that improve income generation and the availability of livestock-derived foods. For example, after the snowfall and avalanches that occurred in Pakistan between December 2019 and January 2020, FAO distributed poultry to help the most vulnerable affected families to build back better (35).
- Provide enough feed for a small number of animals kept at the household to keep them in lactation longer into the winter.
- Provide trainings on feed requirements for livestock lactation during cold weather, ideally delivered simultaneously with nutrition interventions for women and children for vulnerable households.
- Provide food-insecure households with vouchers or cash to access veterinary support such as appropriate seasonal vaccinations before winter, and care for sick animals during winter.
- In the autumn, match food-insecure households with traders who have agreed to provide favourable prices for livestock and products such as wool so that they enter winter with more cash to buy food and other necessities.

## 6. Preparedness and risk reduction

While LEGS interventions focus on emergency response and recovery, LEGS Principle 4 emphasizes supporting preparedness (pages 58–59), and early action and standards on preparedness are included in five of the six technical intervention chapters (pages 151, 186, 226, 268 and 303). For example, Standard 1 in the chapter on livestock offtake (page 303) is 'Preparedness: The critical time for livestock offtake is identified and preparedness activities undertaken'. Corresponding Guidance Note 4 (page 304) includes identifying traders, value adders, meat processers, ranchers etc. so that commercial offtake can be implemented on time. For a slow-onset emergency such as a dzud, these assets can be identified during the normal and alert phases when an Early Warning System (EWS) alert has been issued. However, in areas that are prone to rapid-onset emergencies like an avalanche, communities and agencies need to be well prepared so that actors can be mobilized quickly to move animals that have survived but can't be cared for to market as quickly as possible.

The Disaster Risk Management Cycle (pages 28–29) is framed by Disaster Risk Reduction (DRR) activities that reduce the risk that a shock results in an emergency. The key elements of DRR are preparedness, contingency planning and early response. For example, Mongolia's disaster protection plan template is used by local governments for two purposes—first, to identify problems that could make the impact of a winter storm or extreme cold weather event worse, such as degraded pastures where forage production is poor, or could prevent an effective response, such as roads that are in disrepair. These problems are then prioritized, and throughout the year local governments prepare for winter by investing in repairs and other necessary actions. Second, local governments develop contingency plans for responses to common winter events, which allows them to respond early to an event.

EWS help to identify when and where severe winter conditions are expected. The Mongolian Information and Research Institute of Hydrology, Meteorology and Environment (IRIHME) produces monthly *dzud* risk maps that it distributes to Mongolia's ministries, NEMA, local governments, the media and the Food Security

<sup>5</sup> Supplemental feeding of livestock to continue milk production during the winter is not common practice in areas of Asia subject to winter storms and extreme cold weather events, because of the large number of additional calories that would need to be provided. It may be hard to overcome the normal practice of declining milk production during winter, and so this intervention may need to be targeted to only the most food-insecure households.

Cluster so that livestock keepers and local governments can prepare for severe winters (5) (19). Mercy Corps' Leveraging Tradition and Science (LTS) project developed and transferred to NEMA an short message service (SMS)-based system whereby livestock keepers can prepare for the winter with information about the weather, pasture conditions, snow fall and *dzud* early warnings (16).

Mercy Corps and World Vision have helped local governments in Mongolia integrate LEGS into their annual disaster plans so that they are prepared to take early actions like stocking extra feeds when a *dzud* is anticipated (14). This early warning serves as the basis of *Dzud* Early Action and Response Plans that are issued for Mongolia by its Humanitarian Country Team such as in 2024 (22). The Humanitarian Country Team also uses the EWS to coordinate the *dzud* response with humanitarian actors (18).

# 7. Good practices and things to remember

When responding to severe winters and extreme cold weather events, good practices to keep in mind are:

• Support rather than supplant indigenous practices for managing livestock and household nutrition that reduce vulnerability to severe winters and extreme cold weather events.

- The impacts of severe winters and extreme cold weather events often disproportionately affect women and children and put them at risk of GBV. Livestock-based interventions should be designed to minimize such risks for women and children.
- Livestock-related humanitarian responses should support the food security and nutrition of vulnerable households as well as livestock livelihoods.
- The eight LEGS principles should be integrated into every livestock-based response.
- Every livestock-based response should be designed to support one or more of the LEGS livelihood objectives.
- To identify the most appropriate technical interventions and design the best response, follow the LEGS response planning process, including the initial assessment using the LEGS checklists, response identification using the PRIM, analysis of interventions and options, and developing the response plan.
- Access information from EWS and implement anticipatory actions to prevent or mitigate the magnitude of severe winters and extreme cold weather events.



## Annex 1: Examples of livestock-based interventions for slow-onset severe winters and extreme cold weather events

Technical	EMERGENCY PHASES			
intervention	Alert	Alarm	Emergency	Recovery
Livestock feed (Chapter 4: Technical Standards for Livestock Feed)	<ul> <li>Assess the national feed balance, identifying surplus and deficit areas</li> <li>Conduct market assessments to identify feed traders and sellers</li> <li>Repair household and central feed storage infrastructure</li> <li>Preposition feed stocks in deficit areas</li> <li>Provide feed to food- and nutrition-insecure households to keep a small number of animals at the homestead in lactation during winter</li> <li>Print vouchers for access to livestock feed</li> </ul>	- Where livestock condition scores have begun to deteriorate, begin support to feed distribution; use Cash and Voucher Assistance (CVA) whenever possible; target feed distribution to the most valuable breeding stock, supporting livestock offtake for non-core breeding animals	<ul> <li>Continue home-based emergency feeding; re-evaluate modality and continue with CVA or switch to direct distribution if necessary</li> <li>Consider switching to in-out feed camp systems in sedentary farming areas</li> <li>Consider switching to residential feed camp systems in areas where households have become displaced or where migrating pastoral herds have concentrated</li> </ul>	<ul> <li>Continue feed distribution until pastures have regrown to avoid localized overgrazing</li> <li>Continue feed distribution to vulnerable households until cultivated fodder can be harvested or pastures regrown</li> <li>When supporting new livestock livelihoods with the provision of livestock, ensure beneficiaries have access to necessary feed for the first production cycle</li> </ul>
Provision of water (Chapter 5: Technical Standards for the Provision of Water) <sup>6</sup>	<ul> <li>Assess waterpoints, identifying strategic waterpoints that need repair in settled areas and in migration areas</li> <li>Train waterpoint committees on waterpoint management and maintenance</li> <li>Identify waterpoint repair service providers, assess availability of parts and equipment, and place orders for out-of-stock and low-stock items for waterpoint repair</li> </ul>	<ul> <li>Repair strategic water points</li> <li>Print vouchers for access to water for household use and livestock (providing access to water only for household use or only for livestock forces households to divide limited amounts of water to meet all its needs so that no need is adequately met)</li> <li>Train waterpoint committees on voucher system</li> </ul>	<ul> <li>Continue provision of water point repairs</li> <li>Distribute jerrycans so that households can collect water for household use</li> <li>Use CVA whenever possible</li> </ul>	<ul> <li>Hand over waterpoint repair kits to waterpoint committees</li> <li>Support drilling of new waterpoints in communities and migration areas that are water deficient</li> </ul>

14

Technical	EMERGENCY PHASES			
intervention	Alert	Alarm	Emergency	Recovery
Veterinary support (Chapter 6: Technical Standards for Veterinary Support)	<ul> <li>Map veterinary service providers and prices</li> <li>Provide animal health service providers (AHSPs) with refresher training</li> <li>Support local government, private AHSPs, private veterinary pharmacies (PVPs) and local livestock keepers to identify the main disease threats for livestock and livelihoods</li> <li>Ensure curative and preventative animal health services are available through local government and/ or private providers, including advice on zoonotic diseases</li> <li>Use private AHSPs paid by livestock keepers using CVA where possible</li> <li>Begin support for livestock disease surveillance, providing information to livestock keepers of disease threats and outbreaks</li> </ul>	<ul> <li>Monitor the delivery and coverage of animal health services, ensuring that key diseases are being addressed</li> <li>Where appropriate, support vulnerable households to access clinical veterinary services through private AHSPs using CVA</li> <li>Monitor drug storage and use practices of AHSPs and PVPs, providing corrective support as necessary</li> <li>Develop a carcass disposal plan including transportation, disposal sites and disposal protocol; train participating personnel on the plan, health and safety risks, use of personal protective equipment etc.</li> </ul>	<ul> <li>Continue support for disease surveillance and information, access to clinical veterinary services, and monitoring of AHSPs and PVPs</li> <li>Implement carcass disposal plan; monitor implementation</li> </ul>	<ul> <li>Continue access to clinical veterinary services and monitoring of AHSPs and PVPs until vulnerable livestock keepers are able to pay for veterinary services</li> <li>Establish monitoring system for carcass disposal sites for leakage, water contamination, predator disturbance etc.</li> </ul>
Livestock shelter and settlement (Chapter 7: Technical Standards for Livestock Shelter and Settlement)	<ul> <li>Identify indigenous livestock shelter practices and assess livestock shelters in at-risk areas; procure materials necessary for repair and building new shelters</li> <li>Support livestock keepers to build effective livestock shelters using local materials</li> <li>Ensure livestock keepers are aware of how to prevent respiratory and other diseases that increase in confined spaces (see Chapter 6: Veterinary Support)</li> </ul>	<ul> <li>Support vulnerable households to repair their shelters or build new shelters</li> </ul>	<ul> <li>Provide emergency livestock shelter to households that have lost shelters; support vulnerable livestock keepers whose shelters are damaged by winter events to repair them</li> <li>If livestock keepers are displaced with their animals, ensure the host community or camp includes a secure and healthy location for livestock; train livestock keepers on livestock facility management and maintenance</li> </ul>	- Transition households using emergency shelters to more durable and sustainable solutions

Technical	EMERGENCY PHASES				
intervention	Alert	Alarm	Emergency	Recovery	
Livestock offtake (Chapter 8: Technical Standards for Livestock Offtake)	<ul> <li>Assess local and national livestock market capacity to absorb excess animals; work with value chain actors to increase capacity</li> <li>Support public announcements (radio, television, community meetings, SMS etc.) about the <i>dzud</i> early warning and the benefits of destocking at-risk animals</li> <li>Identify and contract livestock traders willing to buy animals from remote households, providing incentives as necessary; connect households and traders</li> </ul>	<ul> <li>Continue support for commercial livestock offtake</li> <li>Design a slaughter offtake for consumption programme, including butchers and meat inspectors, management of waste, and health and safety; train programme personnel</li> </ul>	- Switch to slaughter offtake for consumption if necessary		
Provision of livestock (Chapter 9: Technical Standards for the Provision of Livestock)				<ul> <li>Identify indigenous restocking practices; if feasible, design and implement a programme to replace lost livestock assets that complements these practices for vulnerable households that are unable to recover their livelihoods without assistance</li> <li>Ensure availability of associated support packages</li> </ul>	

#### Mongolia case study

The 2023–24 *dzud* brought the most snow in almost 50 years (32), killing 7.44 million animals (18), with more than 7,000 families losing over 70% of their animals (21). In February 2024 when the *dzud* began to set in, the government of Mongolia distributed hay, fodder, food, petrol and medical supplies to herders in the worst-affected districts, and the United Nations issued an appeal for USD6.3 million in additional assistance based on the *Dzud* Early Action and Response Plan developed in collaboration with relevant authorities in the Government of Mongolia (22). In response, nine organisations provided humanitarian assistance spanning nine different technical areas across 237 districts, including food security and agriculture assistance. Livestock-based interventions were implemented by World Vision, Good Neighbors and FAO. Multiple organisations also provided multi-purpose cash transfers that could be used by beneficiaries to support their livestock. Mongolia's Humanitarian Country Team coordinated between partners to ensure there were no redundancies and gaps in assistance, and maintained an online information system to provide humanitarian actors with regularly updated information about the *dzud* and its impacts on livestock (18). Source: OCHA. (2024). Mongolia: 2024 *Dzud* Early Action and Response Plan (December 2023–May 2024) and Mongolia Humanitarian Country Team. (2024). 2024 *Dzud* livestock losses dashboard.

#### Afghanistan case study

A cold wave hit Afghanistan between December 2022 and January 2023, resulting in the loss of 46–100% of cattle, sheep, goats and camels in households exposed to the shock across all production systems, from farmers to nomads. The main reasons for the massive losses included heavy snowfall, lack of housing, lack of feed and diseases. An FAO assessment of the extreme event and its impact recommended that emergency relief assistance be provided, including cash, livestock feed concentrates and animal health services (6). Source: FAO. (2024). Afghanistan: Cold wave assessment on livestock. Data in emergencies impact report, July 2023.

#### Nepal case study

On 3rd November 2023, an earthquake struck the mid- and high-hill mountainous regions of Nepal's Karnali province, where 70% of the population were engaged in agriculture. Five hundred and thirteen animals were lost during the earthquake, particularly cattle and goats, worth USD188,167. Many more animals were injured, and households lost their livestock shelters and stocked fodder (3). An FAO assessment of the earthquake and its impact recommended that humanitarian assistance be provided to reconstruct animal sheds and restock cattle and goats (7). However, two months later in January, the humanitarian response was slow-moving, with just 45% of displaced households in temporary shelter and no livelihood support provided. The provincial government initiated an elaborate food security response plan involving reviving the livestock sector, but without support for basic early recovery households were in jeopardy of not being able to take advantage of the plan (29). Source: Derived using information from FAO's Nepal: Impact of the November 2023 earthquakes – DIEM-impact report, April 2024.



#### References

- BBC. (2022, 9 January). Pakistan snow: Hundreds rescued from vehicles in deadly blizzard. Retrieved July 22, 2024, from https://www.bbc.com/ news/world-asia-59927266.
- 2 Bertram-Huemmer, V. and Kraehnert, K. 2017. Does Index Insurance Help Households Recover from Disaster? Evidence from IBLI [Indexbased livestock insurance] Mongolia. American Journal of Agricultural Economics, 100(1): 145-171. https://doi.org/10.1093/ajae/aax069
- 3 Bhandari, R. P. (2024). Jajarkot EQ analysis report: Rescue, relief and early recovery. Retrieved July 22, 2024, from https://www.dpnet.org.np/ resource-detail/1718
- 4 Core Humanitarian Standard website. The CHS: Nine commitments to people affected by crises. Retrieved July 22, 2024, from https://www.corehumanitarianstandard.org/the-standard
- 5 Davaadorj, A., Erdenetsetseg, B., Elbegjargal, N., & Oyunjarga, L. (2017). Dzud early warning system over Mongolia. Presented at the 5th Session of the EASCOF, 8–10 November 2017, Tokyo, Japan. Retrieved July 222, 2024, from https://www.data.jma.go.jp/tcc/tcc/library/EASCOF/2017/ P3-4.pdf
- 6 FAO. (2024). Afghanistan: Cold wave assessment on livestock. Data in emergencies impact report, July 2023. Retrieved July 22, 2024, from https://openknowledge.fao.org/items/0584751b-d0af-4eaf-8e81b593df798fd8
- 7 FAO. (2024). Nepal: Impact of the November 2023 earthquakes DIEM-impact report, April 2024. Retrieved July 22, 2024, from https:// doi.org/10.4060/cd0639en
- 8 FAO 2022. The resilience capacity analysis of Mongolian herder households using the RIMA was first conducted under the UN Joint Programme on "Expanding Social Protection to Herders with Enhanced Shock Responsiveness" with the aim of providing the evidence needed to better understand and support Mongolian herder households based on what they need most. https://mongolia.un.org/sites/default/files/2023-08/ RIMA-eng\_0.pdf. Accessed 5 August 2024.
- 9 FAO. 2016. Livestock-Related Interventions During Emergencies The How-To-Do-It Manual. Edited by Philippe Ankers, Suzan Bishop, Simon Mack and Klaas Dietze. FAO Animal Production and Health Manual No. 18. Rome. https://openknowledge.fao.org/server/api/core/ bitstreams/465f2789-aed4-4250-a99d-98c2a2b07cf6/content
- 10 Global Resilience Partnership. 2023. The struggles of a herder from Rasuwa, Nepal, 27 June 2024. https://www.globalresiliencepartnership. org/the-struggles-of-a-herder-from-rasuwa-nepal/. Accessed 22 July 2024.
- 11 Humanitarian Coalition. (2020). Winter storm, Pakistan, January 2020. Retrieved July 22, 2024, from https://www.humanitariancoalition.ca/ winter-storm-pakistan
- 12 Humanitarian Standards Partnership website. Retrieved July 22, 2024, from https://hspstandards.org/
- 13 LEGS. 2023. Livestock emergency guidelines and standards (3rd ed.). Rugby, UK: Practical Action Publishing. https://practicalactionpublishing. com/book/2672/livestock-emergency-guidelines-and-standards-3rdedition
- 14 LEGS. (2023). Strategy for the institutionalization of the Livestock Emergency Guidelines and Standards (LEGS) in Mongolia–April 2023. Retrieved July 22, 2024, from https://www.livestock-emergency.net/ wp-content/uploads/2023/06/Strategy-for-Institutionalising-LEGS-in-Mongolia-April-2023.pdf
- 15 Mercy Corps. 2020. Leveraging Tradition and Science in Disaster Risk Reduction in Mongolia - 3 (LTS3), final report, December 2020. https:// pdf.usaid.gov/pdf\_docs/PA00XF3D.pdf. Accessed 22 July 2024.
- 16 Mercy Corps. (2017). Mongolia strategic resilience assessment, final report, April 2017. Retrieved August 5, 2024, from https://www. mercycorps.org/sites/default/files/2019-12/Mercy\_Corps\_Strategic\_ Resilience\_Assessment\_Mongolia\_April\_2017.pdf
- 17 Mercy Corps. 2015. Leveraging Tradition and Science in Disaster Risk Reduction in Mongolia-2 (LTS2-Mongolia), quarterly program report, 30 July 2015. Retrieved July 22, 2024, from https://pdf.usaid.gov/pdf\_docs/ PA00KKFW.pdf

- 18 Mongolia Humanitarian Country Team. (2024). 2024 Dzud livestock losses dashboard. Retrieved July 22, 2024, from https://app.powerbi.com/ view?r=eyJrljoiODIxNzExMzYtNWNjZi00NzUzLTk5MzktZDM2ZTR kOGRkZDIIliwidCl6ljBmOWUzNWRiLTU0NGYtNGY2MC1iZGNjLTVIY TQxNmU2ZGM3MClsImMiOjh9
- 19 Nandintsetseg, B., Shindoa, M., & Erdenetsetseg, B. (2019). Developing an early warning system of *dzud* (cold-season disaster) in Mongolia. Retrieved July 22, 2024, from https://www.researchgate.net/ publication/340861520\_Developing\_an\_Early\_Warning\_System\_of\_ Dzud\_cold-season\_disaster\_in\_Mongolia
- 20 Nandintsetseg, B., Shinoda, M., Du, C. et al. Cold-season disasters on the Eurasian steppes: Climate-driven or man-made. Sci Rep 8, 14769 (2018). https://doi.org/10.1038/s41598-018-33046-1
- 21 Yoon, J., & Sengupta, S. (2024, April 1). A harsh Mongolian winter leaves millions of livestock dead. The New York Times. Retrieved July 22, 2024, from https://www.nytimes.com/2024/03/29/world/asia/mongolia-winteranimals-dead.html#:~:text=Mongolian%20herders%20are%20no%20 strangers,according%20to%20the%20United%20Nations
- 22 OCHA. (2024). Mongolia: 2024 *Dzud* Early Action and Response Plan (December 2023–May 2024). Retrieved July 22, 2024, from https://www. unocha.org/publications/report/mongolia/mongolia-2024-dzud-earlyaction-response-plan-dec-2023-may-2024
- 23 People in Need. (2017). Support of basic needs and livelihood protection of vulnerable dzud-affected herder households in Dornod province, Mongolia, June 2019. Retrieved August 5, 2024, from https://mongolia. peopleinneed.net/media/publications/2063/file/report\_people-in-needbasic-findings-from-post-distribution-monitoring\_dzud-emergencyresponse-2017.pdf
- 24 Paudel and Parajuli. (unknown date of publication). Yak husbandry and rangeland management in Nepal. CABI Digital Library. Retrieved July 22, 2024, from https://www.cabidigitallibrary.org/doi/ pdf/10.5555/20163337395
- 25 Prevention Web. 2024. Saving the Gobi Desert and Mongolian steppes from the *dzud* will also save lives and livelihoods, 12 Marcy 2024. https:// www.preventionweb.net/news/saving-gobi-desert-and-mongoliansteppes-dzud-will-also-save-lives-and-livelihoods. Accessed 22 July 2024.
- 26 Save the Children. (2024). Another severe winter in Mongolia as climate change puts children at risk - Save the Children, 29 January 2024. Retrieved July 22, 2024, from https://www.savethechildren.org.au/media/ media-releases/another-severe-winter-in-mongolia-as-climate-chang
- 27 Seyyed, H. (unknown date). Climate change and the winter weather. Pakistan House. Retrieved August 5, 2024, from https://pakistanhouse. net/climate-change-and-the-winter-weather/
- 28 Sphere Association. (2018). The sphere handbook: Humanitarian charter and minimum standards in humanitarian response (4th ed.). Geneva, Switzerland. www.spherestandards.org/handbook
- 29 Thapa, R. (2024). Jarjarkot earthquake, quad-day situation analysis report, 6-9 January 2024. Retrieved July 22, 2024, from https://www.dpnet.org. np/resource-detail/1699
- 30 Lawrence, D.. (2009, July 8). Mongolia's growing shantytowns: The cold and toxic ger districts. World Bank Blogs. Retrieved July 22, 2024, from https://blogs.worldbank.org/en/eastasiapacific/mongolias-growing-shantytowns-the-cold-and-toxic-ger-districts
- 31 World Bank Group. (2020). Bringing herders closer to markets and livestock services. Results brief November 30, 2020. Retrieved July 22, 2024, from https://www.worldbank.org/en/results/2020/11/30/bringingherders-closer-to-markets-and-livestock-services
- 32 WHO. (2024). *Dzud* in Mongolia. Retrieved July 22, 2024, from https:// www.who.int/westernpacific/emergencies/dzud-in-mongolia
- 33 World Vision Mongolia. (2023). Mongolian dzud emergency response (MONDER) project final report, 2 October 2023. Available from World Vision, Inc. (US), 300 I Street NE, Washington, DC, 20002, USA.
- 34 World Vision Mongolia. (2023). Gender-based violence rapid assessment during dzud, final report. https://test.wvi.org/sites/default/files/2023-11/ GBV\_RAPID\_ASSESSMENT\_DURING\_DZUD\_2023.pdf
- 35 United Nations CERF. (2021). Pakistan rapid response winter emergency 2020. Retrieved July 22, 2024, from https://cerf.un.org/sites/default/files/ resources/20-RR-PAK-41273\_Pakistan\_CERF\_Report\_0.pdf





LEGS Vesey Farm Little Clacton Road Great Holland Essex CO13 0EX United Kingdom

- coordinator@livestock-emergency.net
- 📀 www.livestock-emergency.net
- @TheLEGSProject

Winter Storms and Extreme Cold Weather Events - A guide to livestock-based emergency preparedness, response and recovery. A technical briefing paper for the Livestock Emergency Guidelines and Standards. Livestock Emergency Guidelines and Standards, UK.

© Livestock Emergency Guidelines and Standards (LEGS) 2024

Disclaimer: This publication was commissioned by LEGS and produced independently by the author. The views expressed in the paper are not necessarily endorsed by LEGS.