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Food security in the face of climate risks – Mongolian herders' experiences

Pastoralists in Jinst, Mongolia, have faced both climate-related shocks (such as droughts and winter freezes – dzuds) and rapid economic change. In response, they have taken collective action to reduce risks to their income, nutrition and wellbeing. Collective management has helped store animal fodder for hard times and diversification has raised herders' incomes, better-protecting food security.

Overview

Mongolia, with 2.87 million people living on 1.5 million hectares, is the world's most sparsely populated country. This remote landlocked nation experiences high solar radiation, low precipitation and wide-ranging temperatures that result in a dominant steppe ecosystem. Mongolia's climate and natural resources are most suitable for extensive grazing, and pastoral livestock production is a major economic sector. Mongolia has about 44 million head of cattle, horses, camels, sheep and goats, averaging about 15 animals for every person in the country. Seventy per cent of the population works entirely in pastoral animal husbandry.

Herder households generally eat enough calories from their wheat, meat and milk-based diet, but its poor diversity means micronutrient deficiencies are common. Extreme weather, in both summer and winter, also present high risks to nutrition and food security. Across Mongolia, average temperatures have increased by about 1.6°C during the past 60 years.[1] Droughts are common and climate change is already affecting water availability and range lands. But an even bigger hazard comes from winter disasters, called dzuds, in which extended and extreme cold, combined with repeated snowfalls, kills many livestock. These climate-related challenges are further exacerbated by low livelihood diversification[2]. Large portions of the population can become destitute and food insecure from one season to the next if livestock is lost. Poor households (those having 50 or less head of livestock – about a quarter of the total herder population) are particularly vulnerable.

Herders have also faced market price risks linked to the country's transition from a centralised planned economy to a free market economic system post-1990.

During the transition period, inadequate income and savings, coupled with an undeveloped market and high inflation rates, encouraged herders to sell their products cheaply or accept disadvantageous bartering through middle-traders. The situation worsened when the country experienced a series of severe and consecutive droughts and dzud disasters from 1999 to 2002.

However, overall the market price for livestock products, especially raw cashmere, remained stable and high until early 2008, when a further economic shock faced herders. Most livestock products dropped rapidly in price, and the value of cashmere halved. These falls cut the value per head of livestock, meaning herders had to increase herd sizes to maintain income. In 2009, the price for cashmere started gradually increasing, again encouraging farmers to rapidly increase their herds.

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Bayarmaa Baljinnyam is a herder from Jinst County, Bayankhongor province, Mongolia.

This case study focuses on risk-reduction strategies in Jinst, an administrative area (soum) covering 531,264 hectares of mostly range lands and home to co-author Bayarmaa Baljinnyam. Jinst's population in 2012 was 2,115 people in 537 households. About 40 per cent of the population is younger than 18 years.

Bayarmaa's family belongs to the Orgil herder group, which includes 14 families who share the same pasture and grazing area. She lives about 40 kilometres from her nearest settlement (Jinst soum centre), which has a population of about 300. Her family of five mainly raises sheep and goats, which are the livestock best adapted to the semi-desert range land conditions. Her livelihood, and the family's food supply, depends entirely on her herd. What the family does not consume is normally sold in the market. Like all women in herding households, Bayarmaa is responsible for milking sheep, goats and camels to produce yogurt, Mongolian cheese and curds – the staple food items in the herder's diet. With a large enough herd, families can supply all of these staple food items throughout the year. Wheat flour, rice and tea are bought in local markets. A few families with smaller herds grow vegetables, such as potatoes, turnips, carrots and onions.

Herders raise a mixed herd in the new market economy, as it is too risky to tend the single species herds that were the norm during the collective period. However, from early 2000 herd composition has gradually shifted towards goats due to goat cashmere's rising market price. Goat cashmere, which is easier and cheaper to harvest, store and market than sheep wool, has become a main source of income, with sheep providing the bulk of a family's meat and domestic wool.

Poor families in Jinst were particularly affected by the 1999 to 2002 dzud. They lost proportionally more animals and had less access to resources including animal feed. Family food intake fell and its diversity declined. Families could not build up a store of dairy products or meat for the next winter, and faced the prospect of slaughtering their few remaining livestock. By spring 2002 all the cattle and horses and two-thirds of the sheep and goats (particularly female and young animals) had perished. Without lactating female animals to provide milk and dairy products, herder families faced deficiencies in essential nutrients and further nutrition-related health problems, especially among children, pregnant and lactating mothers, and elders. Access to and availability of essential non-food items and services such as candles, home-heating fuels, clothing, and education were also restricted. Some families lost all their livestock and were forced to move to district centres to seek alternative employment.

For almost two years many households did not have enough milk and meat to consume, as they were trying to rebuild their remaining flocks (a challenge heightened by several poor breeding seasons with high mortality and miscarriage rates). Local Jinst soum statistics report the total number of livestock dropped from 125,185 in 2000 to 24,104 in 2002.

Interventions and impacts

The experiences of Bayarmaa Baljinnyam and her neighbours and family shows the kinds of strategies and practices herder households test and adopt to minimise the risks from ongoing socioeconomic and climate change shocks on food security and nutrition.

Families with larger herds and herders with greater livestock management experience were less affected by the 1999 to 2002 dzud. Their resilience can largely be attributed to better skills and preparation for the coming winter.

For example, setting aside a reserve pasture is a common traditional practice among Jinst herders. Studies have shown that access to such reserve pastures and storage of hay and hand-fodder helps herders to reduce risks and vulnerability to dzud.[3]

The households in Jinst agreed to jointly address their common issues of food security, nutrition and climate change by organising for collective action. Between 2003 and 2008 the herders in Bayarmaa's neighbourhood were part of a UNDP-supported Sustainable Grassland Management Project, implemented by the Ministry of Food and Agriculture.[4] They rehabilitated winter shelters for livestock and received training on storing hay and hand fodder in preparation for any future dzud. They formed a community-based organisation to improve their livelihoods and regulate access and use of pasture land (for example a strict schedule for seasonal movements that helped ensure pasture could recover from year to year, and small reserve pastures kept to graze weak livestock and offspring in the spring or during blizzards). Herders had assigned tasks and roles within the group.

As a formal organisation, the group gained frequent interactions with local government and other external organisations, such as donors and non-governmental organisations. These interactions have helped herders mobilise small grants and technical assistance for well rehabilitation, development of common reserve pastures and alternative income-generation activities.

Bayarmaa Baljinnyam

Bayarmaa Baljinnyam's youngest daughter with their goat herd

Bayarmaa, for example, received training in producing handicrafts, felt boots and other felt products and this has increased her family's livelihood options. Along with other women herders, she can use sheep wool to make felt mittens and socks and sell them for cash to local people: "A few hundred grams of wool is required to make warm winter socks. In our soum, one kilogramme of wool is 500 tug (about 30-35 US cents) and about five to six products could be made from 1kg of wool. Normally in the winter warm socks are sold at about 2,000-2,500 tug (US$2)."

In 2009-2010, Jinst herders experienced another devastating dzud, but its affects were less severe. Local leaders tell the story, saying: "Herders in our group established a small area for reserve pasture by fencing it and kept it from summer and fall grazing for several years. By December of 2009 the forage in the reserve pasture was very think and almost one meter high and we used it in the critical time of spring 2010."

Another group leader mentioned that: "This time we didn't have much livestock losses, as we reserved pasture areas, collected hand fodder, and warmed up the livestock shelters. This helped a lot to overcome this year's dzud." One experienced elder shared that: "The main factor that saved our livestock during the past dzud is warm livestock shelters and constant feeding of younger and weak animals with hand fodder and supplemental feeds in the period from November to May, until young grass shoots. We occasionally grazed the livestock in the reserve pasture."

Main achievements and challenges

Community organisation has allowed herders to improve how they manage both climate and market risks – for example, by regulating land use and preparing fodder for winter, and by accessing training for vegetable and root crop cultivation, insect control, fertilisation and irrigation. The small-scale gardens families have established for household consumption have enabled them to diversify their diet.

Herders now also aim to raise more goats than other livestock – for the cashmere income value. There is a well-developed permanent cashmere market across the country, whereas the market for meat, dairy products and sheep wool varies depending on location and infrastructure development.

Community organisation has helped access training in value-added skills such as wool processing, felt making and maximising production of dairy products for outside markets. In 2007, several herders from Bayarmaa's group participated in an exhibition and trade fair in Uvurkhangai provincial centre. They had about 500 kilogrammes of dairy products that quickly sold out.

The process of group formation has been empowering for the herders and has strengthened their customary structures of cooperation. By being part of organised groups, herders can cooperate and network with local officials and trainers more often

than before and their group leaders and activists can communicate their concerns and interests across multiple scales and networks. Bayarmaa, for example, was the elected chair of the local citizen representative assembly from 2008-2012.

Lessons

Traditional strategies for coping with risk may not, on their own, be adequate to deal with the increasing effects of climate change, especially when compounded by other stresses. For herders in Mongolia, drought and dzud were compounded by issues of globalisation, market liberalisation and resource degradation. Traditional strategies can still however, contribute much that is useful. For example, adaptive management of the livestock sector in the face of climate change can draw on pastoralists' own drought and dzud strategies.

Collective action helps to scale up good risk management practices. For example, the herders have reduced their vulnerability by collectively harvesting and storing hay and fodder, establishing pasture reserves, improving livestock shelters and producing value-added livestock products. Small-scale gardens the families have established for household consumption have enabled them to diversify their diet.

Collective action spreads risk and builds social capital. Organising has allowed herders not only to pool resources among themselves, but also to draw on the resources of government agencies and non-government organisations to reduce their vulnerability to risk.

Being well prepared is a key risk management strategy. For herders, being well prepared for drought and dzud involves improving how local food and livestock markets function (aiming for easier buying, selling, transporting), as well as providing for future emergencies (for example, sites for simple slaughtering and processing, arrangements to use reserved areas).

Bayarmaa Baljinnyam

Bayarmaa Baljinnyam's family. play shagai, a traditional game using bones

Notes

[1] Batima, P., Natsagdorj, L., Gombluudev, P., Erdenetsetseg, B. 2006. *Observed Climate Change in Mongolia*, AIACC Working Paper No.12. www.aiaccproject.org [2] FAO/UNICEF/UNDP. 2007. *Special report on joint food security assessment mission to Mongolia*. www.fao.org/docrep/010/j9883e/j9883e00.htm [3] Fernandez-Gimenez, M.E., Baival, B., Batbuyan, B. 2012. Cross-boundary and cross-level dynamics increase vulnerability to severe winter storms (dzud) in Mongolia. *Global Environmental Change* 22: 836-51. [4] United Nations Development Programme. 2008. *Terminal Report: Sustainable Grassland Management project*. Interpress, Ulaanbaatar.