

The Mongolian rural economy is based on livestock reared by semi-nomadic herders. Agriculture contributes around 20 percent of the country's gross domestic product, and herding accounts for more than 80 percent of agriculture. According to the 2008 livestock census, Mongolia has about 44 million head of livestock, consisting of goats, sheep, cattle, yaks, horses, and camels. Livestock provide sustenance, income, and wealth to nearly half the residents of Mongolia. Shocks to the well-being of livestock therefore have devastating implications for the rural poor and for the overall Mongolian economy. Major shocks are common because Mongolia has a harsh climate where animals are herded with limited shelter. From 2000 to 2002, harsh winters (*dzud*) killed 11 million animals. The Government of Mongolia has struggled with the obvious question of how to address this problem.

Managing risk in the livestock sector requires a combination of risk mitigation and financial approaches. Pastoral risk mitigation, including winter shelters, fodder crop storage, and improved management of winter pastures, can help herders better prepare for moderate weather events. In extreme *dzud* events—that is, sudden-onset winter storms with very low temperatures, high winds, and heavy snow—high levels of livestock mortality are often unavoidable. Pastoral and herd management must therefore be complemented by financial mechanisms that provide herder households with immediate liquidity after a disaster.

In 2001 the Government of Mongolia requested assistance from the World Bank to address the problem of frequent high death rates in the livestock population. Traditional indemnity-based livestock insurance (based on individual losses) has proved ineffective in Mongolia because of the high cost of covering animals spread across vast areas, ex ante moral hazard (herders failed to protect their livestock), and ex post moral hazard (herders falsely reported animal deaths). The World Bank recommended an index-based insurance program based on livestock mortality rates by species and *soum* (county), as well as a comprehensive risk-financing strategy including self-insurance by herders, market-based insurance, and a social safety net. Index-based insurance can lower administrative costs and reduce moral hazard and adverse selection. Its main disadvantage is the presence of basis risk—that is, the index payout may not exactly match the individual livestock loss.

The Index-based Livestock Insurance Program

In 2005 the government entered into a credit agreement with the World Bank to implement the Index-Based Livestock Insurance Program (IBLIP). The government proposed beginning a three-year pilot program in three provinces of Mongolia, starting with sales in the spring of 2006. The pilot program aimed to provide insurance coverage against catastrophic livestock mortality events to complement household-level risk management strategies for smaller livestock mortality losses.

This program pays indemnities whenever the adult mortality rate exceeds a specific threshold for a localized area (for example,

the *soum* in Mongolia). This system provides strong incentives to individual herders to manage their herds to minimize the impacts of major *dzud* events. If a herder has no losses when his or her neighbors have had large losses, the better herder is rewarded for the extra effort by receiving a payment based on the area losses.

The coverage period is from January until May of a given year, when more than 80 percent of the historical livestock losses occur. The sales season is during spring of the previous year. In early June the National Statistical Office conducts a midyear census, which is compared with the previous end-of-the-year census, conducted in December, to determine the livestock mortality rate of adult animals. The program covers sheep, goats, camels, horses, cattle, and yaks.

Layering livestock risk

The insurance program is a combination of self-insurance, market-based insurance, and a social safety net. Herders bear the cost of small losses that do not affect the viability of their business, larger losses are transferred to the private insurance industry, and only the final layer of catastrophic losses is borne by the government.

The Base Insurance Product (BIP) is a commercial risk product, sold and serviced by insurance companies on a voluntary basis. Herders pay a commercial premium rate for this product, which pays out when the *soum* mortality rates exceed the trigger of 6 percent. The maximum payment for the BIP occurs when mortality rates reach a specified "exhaustion point" of 30 percent. The risk-based premium rate depends on the species and the location. It is slightly lower than 3 percent on average.

The Disaster Response Product (DRP) is a social safety net product financed and provided by government, which begins payment when mortality rates exceed the BIP exhaustion point of 30 percent. Herders who purchase the BIP are automatically registered for the DRP at no additional cost. Herders who do not purchase at least the minimum value of BIP must pay a small administrative fee for DRP.

As an example, consider a herder who owns 100 sheep where the value of a sheep is 20,000 Mongolian tugrik (Tg). The herder decides to insure 50 percent of the total value of his herd—that is, 1 million Tg. The premium rate for the BIP, with a strike (deductible) at 6 percent and a cap at 30 percent, is 3 percent in the selected *soum*, so the herder pays a premium of 30,000 Tg. Suppose the mortality rate in the herder's *soum* during a bad *dzud* year equals 40 percent. The payment rate for the BIP is equal to 30 percent – 6 percent = 24 percent. Thus the BIP payment is 24 percent × 1,000,000 Tg = 240,000 Tg. Payment for the DRP equals (40 percent – 30 percent) × 1,000,000 Tg. = 100,000 Tg.

The Livestock Insurance Indemnity Pool (LIIP)

Because mortality rates are highly correlated across regions in Mongolia, significant risks are associated with the commercial BIP product. Given concerns about financing extreme losses, the pilot

design involves a syndicate pooling arrangement for insurance companies—the Livestock Insurance Indemnity Pool (LIIP). Herders' premiums are deposited into the LIIP until the settlement period. Thus, indemnities are fully protected under this scheme. The LIIP also "ring-fences" this line of business and thus protects the domestic insurance market against any financial contagion caused by extreme livestock losses. The Government of Mongolia fully covers insured losses beyond the LIIP reserves through an unlimited stop-loss reinsurance treaty, backed by the World Bank credit. Reinsurance premiums paid by the LIIP to the government are set aside in the reinsurance reserves. The reinsurance reserves pay for the first layer of losses beyond the stop loss. Once the reinsurance reserves are exhausted, the government can draw upon the World Bank contingent credit to pay for any remaining losses.

Pilot performance and challenges

As of September 2009, three insurance cycles had been completed (Table 1). Participation has increased since the first season and reached 14 percent in 2008–09, exceeding expectations thanks to intensive information campaigns. In the last two seasons, however,

Table 1—Performance of the Base Insurance Product (BIP)

Indicator	2006–07 season	2007–08 season	2008–09 season
Number of pilot <i>aimags</i> (provinces)	3	3	3
Number of insurance companies	3	4	4
Number of BIP policies sold	2,222	3,034	3,281
Number of animals insured (thousands)	246	287	309
Total sum insured (thousand US\$)	4,510	5,588	6,272
Premium volume (thousand US\$)	98	141	153
BIP losses (thousand US\$)	1	195	288
Loss ratio (%)	1	138	189

Note: Table shows only BIP results. Premium volume includes risk-based premiums transferred to the LIIP and administrative and operating expenses (mainly delivery costs) kept by the insurance companies. Exchange rate is 1 US\$ = 1,200 Tg. Loss ratio is defined as the ratio of the BIP losses to the premium volume.

Source: IBLIP Project Implementation Unit, 2009.

losses were heavy compared with the premium volume, and insurers faced underwriting losses.

The IBLIP represents an innovative approach to agricultural insurance based on a strong public–private partnership. Unlike other government-sponsored agricultural insurance programs, it offers no direct premium subsidies to herders. Instead, the government covers other costs, such as the livestock census, the management of the LIIP, and the subsidized reinsurance treaty.

Nevertheless, the program faces major challenges, mainly related to its expansion to nationwide coverage over the next three years. These challenges include the following:

- Technical improvements are needed in data collection, and technical capacity building is needed in the insurance industry.
- To reduce the high cost of providing insurance through insurance agents, insurance products should be linked to other financial services, such as loans, offered through bank branches.
- Currently the government serves as reinsurer, but an important next step is to attract international reinsurers who could also supply international expertise.
- The program is currently managed by a dedicated technical support unit set up under the pilot program and financed by the government, but in the long term these costs should be covered by the scheme out of the commercial premium volume.

Conclusion

The pilot program is the first operation supported by the World Bank involving the design and implementation of a full agricultural insurance program in a developing country. Strong public–private partnerships have been implemented in order to (1) offer insurance products that are attractive and affordable to herders, (2) involve the domestic insurance market while protecting it against catastrophic losses, and (3) limit the government's fiscal exposure.

The pilot approach adopted by the Government of Mongolia ensures that the program will be continually adjusted based on experience. The next step is to expand the program to more *aimags* (provinces) and to strengthen its long-term viability. ■

For further reading: O. Mahul and J. Skees, *Managing Agricultural Risk at the Country Level: The Case of Index-based Livestock Insurance in Mongolia*, World Bank Policy Research Working Paper No. 4325 (Washington, D.C.: World Bank, 2007); O. Mahul and C. Stutley, *Public Support to Agricultural Insurance: Challenges and Options for Developing Countries* (Washington, D.C.: World Bank, forthcoming); Index-based Livestock Insurance Project website, www.iblip.mn.

Olivier Mahul (omahul@worldbank.org) is program coordinator of the Insurance for the Poor Program, World Bank. **Nathan Belete** (nbelete@worldbank.org) is a senior rural development economist at the World Bank. **Andrew Goodland** (agoodland@worldbank.org) is a senior agricultural economist at the World Bank.



International Food Policy Research Institute

2033 K Street, NW • Washington, DC 20006-1002 • USA

Phone: +1-202-862-5600 • Skype: ifprihomeoffice • Fax: +1-202-467-4439 • Email: ifpri@cgiar.org

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