

Index-Based Livestock Insurance in Mongolia:
Potential Impact on Financial Sector Development

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At the request of the Government of Mongolia (GoM), the World Bank is developing a pilot project in Mongolia to provide livestock herders with a risk management instrument to protect them against shocks to their livelihoods resulting from severe livestock deaths. While the primary target is to provide a viable form of livestock insurance, the project design is intended to foster development of the insurance and financial sectors with the broader goal of promoting the development of rural financial markets and new alternatives for risk management. Further it is anticipated new opportunities for risk sharing and risk mitigation can emerge by integrating risk transfer into the activities of NGOs and herder cooperatives.

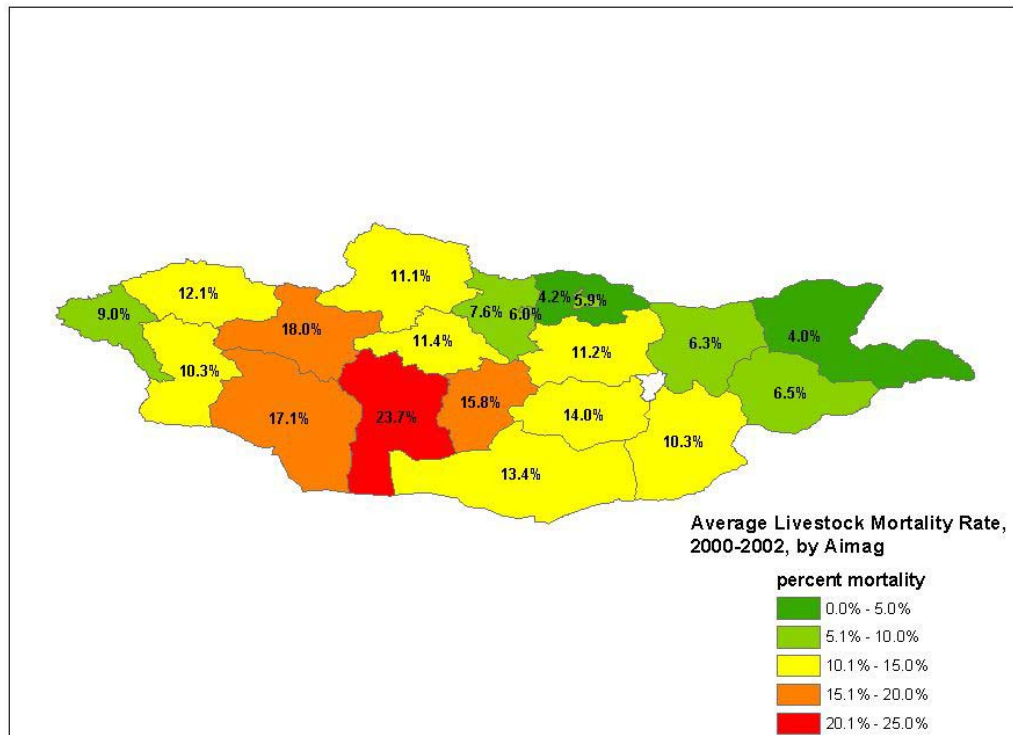
The herding livelihood is constantly challenged by the environment and the weather. During the socialist period, the State provided support to herders to help them deal with severe conditions by providing fodder and veterinary services. However, following the end of the socialist period, this support system was no longer in place. In 2000, 2001 and 2002, extreme weather conditions were compounded by social and economic factors that created a greater vulnerability and as a result millions of livestock died during the winter *dzuds*. During the nineties, economic hardships led many urban households to retreat to the countryside and depend on herding as a livelihood. Though, many new herders lacked the knowledge and experience to properly manage their livestock and natural resources, and to cope with extreme conditions. Additionally, the influx of herders created greater demands on pasture resources and greater competition for access.

Still, the increase in herding households coupled with mild conditions during the nineties led to an increase in livestock which may have put a strain on the carrying capacity of the land. These factors, combined with the absence of State supported mitigation measures, exacerbated the impact of the weather during these three years. Drought and overgrazing during the *summers* of this period meant livestock were not as strong going into the winter and were easily weakened by the extreme conditions.

In these three years a third of adult livestock (over 11 million) died during the winter *dzuds*. Nearly half of all cattle and yak were lost in this time. Losses of this magnitude had a significant impact on herding households. Over 10,000 households lost their entire herd, while the herd size for many others dropped below sustainable levels. Further, the impact on the economy was significant as the combined economic value of the dead

animals for these three years exceeds US\$ 200 million. Figure 1 below illustrates the widespread livestock mortality that occurred from 2000-2002, showing the average livestock mortality rate for each *aimag* over the three year period.

Figure 1. Mortality Rates of Adult Animals



As a result of the losses suffered, the GoM requested assistance from the World Bank in developing a viable livestock insurance scheme that would enable herders to protect themselves against the economic impact of large scale losses of livestock.

Herders in Mongolia are extremely limited in the risk management strategies they can employ to deal with shocks. In an ideal world, households or individuals have several strategies available to them for risk mitigation (e.g., fodder, migration), risk transfer (e.g., insurance), or risk coping (e.g., credit, social support networks, sale of assets). By having a choice of alternatives, households can develop a strategy that might include one or a combination of mechanisms that best suits their needs.

The rural poor throughout the world often have very limited access to formal risk management mechanisms and so often rely on informal sources such as moneylenders or

kin networks. Mongolian herders are no exception. Households who are dependent on agricultural activities are exposed to significant risks from weather, natural disasters, disease, and may experience great variability in their income from year to year. Banks and insurance companies are hesitant to extend their services in rural areas because they do not want to *assume* those risks. For lending institutions, there is a risk that customers will be unable to repay their loans if they lose their livestock. This is of special concern should a widespread disaster occur because a larger proportion of loans may go into default when entire communities are affected. Banks also have concern that following a disaster account holders will withdraw their savings at once to meet their needs, reducing the banks ability to lend credit which would also be in high demand.

Disaster risks pose unique challenges as many of the mechanisms used to manage and cope with other types of risk are not effective when an event has a widespread impact. Whereas individuals may be able to rely on others in their community when they experience hardship due to a health crisis or unforeseen expenses, a natural disaster often causes widespread correlated losses. That is, many people within the same community may be affected by the event and therefore informal moneylenders and social support networks may be unavailable. The sale of assets (property or livestock for example) is another risk coping strategy that may be employed. However, livestock are a significant asset and a source of wealth for herders, so when many livestock die, there are limited assets to fall back on.

For Mongolian herders, weather risks challenge livelihood security but also deter the development of financial markets that could provide some buffer against economic shocks and allow herders to accumulate savings. Developing a financially viable livestock insurance scheme is a challenge. Insuring individual animals requires a great deal of monitoring and underwriting to prevent fraud and to verify claimed losses are a result of natural causes, and not as a result of neglect or abuse. For this reason world examples of existing livestock insurance programs are supported by heavy government subsidies. There is an additional challenge to structuring an insurance product that will hedge against catastrophic events. The risk of widespread livestock losses creates a financial exposure that is too large for insurance companies to handle. In addition, the frequency and severity of a disaster is difficult to predict, so insurers must have access to substantial financial resources in the chance that a major disaster strikes and there are large indemnities to be paid.

There are several issues that deter the use of traditional insurance markets for insuring against natural disasters:

- ❖ correlated risk
 - many losses over a geographic area
 - many claims at one time can bankrupt insurance company
 - insurer may not have adequate reserves to cover all indemnities

- ❖ uncertainty about the frequency and impact of an event
 - makes premium pricing difficult
 - maximum possible liability can be very large

- makes risk financing difficult
- ❖ shortsightedness
 - infrequency of disastrous events lowers perception of risk
 - demand for disaster insurance is low-perception that the likelihood of a payout is too low to justify cost of insurance premium

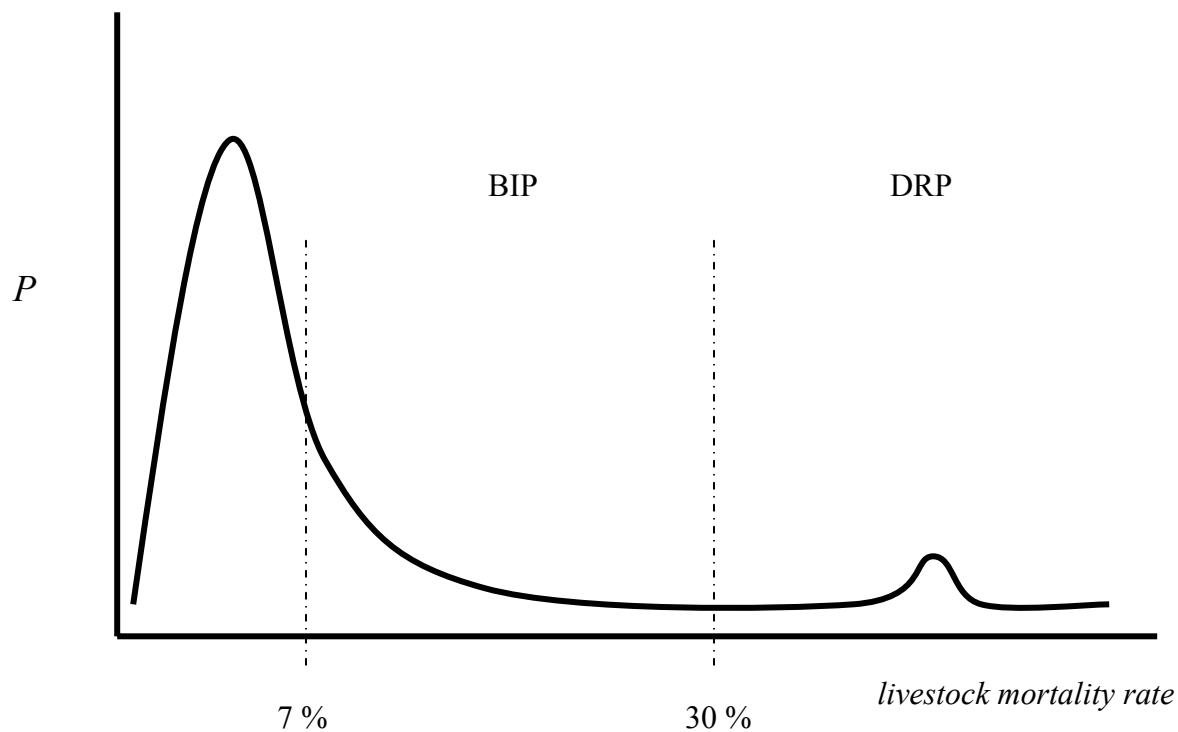
For Mongolia, a new approach needed to be considered that was financially viable and also provided incentives for herders to employ good management and mitigation measures. The GoM does not have the resources to subsidize a traditional insurance program for livestock. Nor does the Government have the financial resources to provide the same level of support that was provided to herders during the socialist period.

Index-based insurance offers a unique approach for managing the risk of events that cause widespread correlated losses. The structure being proposed for the pilot project segments the risk exposure into manageable layers for the insurance companies and for the GoM. It is designed to hedge against the risk of events like the *dzud* events of 2000-2002, that impact large areas and cause high livestock losses. The index-based approach to insurance means that instead of paying for each herder's individual livestock losses the insurance pays based on an objective index of livestock mortality across an entire area. The index uses *sum*-level livestock mortality rates based on statistics gathered by the National Statistics Office. The insurance would pay policyholders when the livestock mortality rate for the entire exceeds a specified threshold.

To make the insurance scheme feasible for insurance companies, the risk is segmented into two layers, one layer that is covered by the commercial insurance providers, and the catastrophic layer that is covered by the GoM. Creating a finite segment of risk for commercial insurers to manage limits their risk exposure, and allows for the calculation of maximum liability and financing requirements.

The Base Insurance Product (BIP) that will be sold by commercial insurers will cover losses for mortality rates between 7 and 30 percent per species and *sum*. Herders will pay a premium for the BIP based on the value of their own herd. They will be able to insure between 30% and 100% of the market value of their herd. Above 30% livestock mortality the GoM will provide disaster payments to herders who have registered for the Disaster Response Product. Figure 2 shows how the risk will be segmented between herders, commercial insurers, and the GoM. The line represents a probability distribution function for livestock mortality rates. There is a high probability of lower levels of mortality. However, the bump in the tail of the distribution indicates that there is a risk of an event causing high livestock mortality. The probability of a catastrophic event is solely based on historic data, i.e. what has happened in the past. Therefore, it is not an accurate predictor of the likelihood of another severe event.

Figure 2. Segmenting the Risk Exposure



The BIP will cover more frequent, less severe losses. The GoM covers low probability, high loss events with the DRP. DRP coverage will be free to herders who have purchased the BIP. Herders who have not bought the commercial insurance will be required to pay a small administrative fee to register to the DRP. Both products will be offered through insurance agents. The GoM will finance all DRP losses, financing the ambiguous, catastrophic risk that is uninsurable in the private market. Essentially, the DRP will provide a structured mechanism for the allocation of government funded disaster relief based on the mortality index. The mortality index determines the payment *rate* for each *sum* while the amount of the indemnity payments made to herders for both products depends on the value of their own herds.

The pilot is planned for 3 *aimags* that are representative of the different agro-climatic zones in Mongolia. Interviews with herders in the proposed pilot areas revealed they are interested in the index-based livestock insurance but only a pilot test will reveal if herders are willing to pay for the insurance and how well the structure functions to meet the needs of herders and the government.



There are limitations to index-based insurance. For example, it does not provide complete risk transfer. Payments are based on what happens in the entire *sum*, and not on each individual loss experience. The mortality rates within individual herds will not always match the aggregate mortality rate for the entire *sum*, thus, indemnity payments will not be perfectly matched to each herder's loss. However, the idea is to provide a starting point. Creating a mechanism to manage the correlated, more severe risks is a step forward in building more complete financial markets so that there are a variety of risk management instruments for people to choose ones that best suit their needs. Index insurance can hedge against the extreme risks and reduce some of the risk exposure for insurance markets and financial institutions. It is envisioned that the index-based livestock insurance will facilitate other rural development objectives including the expansion of rural finance, disaster mitigation and planning, and resource management.

A major emphasis of the pilot project is to provide capacity building to financial and regulatory institutions in Mongolia, so that there is an enabling market environment. During the pilot there will be arrangements will rural bank branches for the transfer of indemnity payments to herders. This arrangement may help to build a relationship between herders and the rural banks, leading to more tailored services for herders. In the future it may also be possible for rural banks and microfinance institutions to reinsure their lending portfolios with index-based insurance to hedge against the risk of loan defaults following a disaster. Alternatively, index insurance could be tied directly to herder loans.

The World Bank and other donors are providing strong support for technical assistance to the insurance sector in general, including strengthening the regulatory and supervisory

capacity of the government. These initiatives are necessary for the development of the index-based livestock insurance project, but will also help the insurance market to develop by establishing standards licensing, reserve requirements, financing arrangements, and contract enforcement. A major hurdle will be to build public trust in insurance companies following some problems in the past.

Using the index-based insurance to hedge against larger losses, insurance companies could then develop other insurance products for herders to protect against more frequent, individual risks or to compensate for differences between the mortality index and an individual's herd losses.

It may also be possible for index insurance to be used to provide mutual insurance for herder groups or cooperatives. Donors may be willing to subsidize the insurance premium as a means to encourage risk mitigation activities such as pasture management and fodder preparation. Any indemnities received could be used to support group activities or needs.

Another goal in the project design was to organize a system for objective and structured disaster response. Disaster assistance is more timely and efficient when there is a clear plan in place for the allocation of aid. In response to the livestock losses of the 2000 and 2001 *dzuds*, international aid poured into Mongolia, yet there was little account of how it was used, or who benefited. Linking a disaster response mechanism to the livestock mortality index allows for an objective and structured determination of disaster payments. While the DRP will not replace the need for additional relief efforts, it should help the GoM and international donors to establish disaster response plans. Since the GoM must finance DRP payments on extreme livestock losses, the GoM will have an incentive to undertake efforts to mitigate vulnerability and the impact of *dzud*. Donor groups may also want to utilize the index to identify areas that are hardest hit and help determine where to focus their efforts.

The motivation behind index-based livestock insurance is to provide a starting point for structuring effective mechanisms for risk management and risk transfer. It is meant to strengthen the insurance sector and foster the development of a variety of risk management instruments.