Livestock Insurance in Mongolia: The Search for New Solutions: Policy Briefing Document for Mongolian Members of Parliament

Submitted by GlobalAgRisk, Inc. under contract with the First Initiative and in Collaboration with The World Bank

The Problem

From 2000 to 2002, over 11 million adult animals died in Mongolia due to harsh winter disasters (*dzud)*. The total population of animals was reduced from over 33 million to less than 26 million – over 48 percent of the cattle and yak died in these three years. Over 10,000 herder families lost all of their animals.

The total value of animals lost from 2000-2002 exceeded US $200 million. Financing losses of this magnitude with any traditional approaches to insurance is simply out of the question. A small percentage of herders in Mongolia purchase such insurance and insurance companies are reluctant to become involved in writing livestock insurance. There are good reasons why traditional insurance will not work in Mongolia:

- ✓ The financial exposure is simply too large for any insurance company. The total value of animals lost from 2000-2002 exceeded US $200 million.
- ✓ It is impossible for the insurer to have adequate information on individual herders in Mongolia. This compounds the classic dual problems of adverse selection and moral hazard.
- ✓ Traditional insurance *reduces* the incentives for herders to care for their animals during *dzud* events.
- ✓ The vast geographic area of Mongolia makes it expensive to perform the basic practices needed to properly manage an insurance program. Among the more

basic problems is verification of the number and value of animals lost by an individual during a *dzud* event.

- ✓ Insurance companies in Mongolia are small, relatively inexperienced in true markets, have very limited financial capacity, and little access to the financial resources of global reinsurance markets.

While many in Mongolia advocate mandatory livestock insurance, such an approach ***fails to address any*** of the problems outlined above. Different approaches are needed. In 2001, Skees and Enkh Amgalan recommended use of readily available data in Mongolia to develop mortality index insurance by sum and species. Since that time more work has been performed on this approach and this document provides the basic recommendations.

Searching for a New Approach

The Government of Mongolia (*GoM)* is searching for solutions. It is likely that a combination of social and commercial risk sharing is needed for the very large risks that are present in livestock mortality. The *GoM* and the international community did respond to the extreme hardships that were created by the loss of 2000-2002. However, a response with more structure to make payments based upon the severity of the loss should be superior to the ad hoc response that followed the events of 2000, 2001, and 2002. Such a response can be structure with 'insurance-like' principles that include collaboration between the *GoM* and other social partners from the international community. This response should involve the *ex ante* financing that is needed to cover some portion of the most catastrophic risk. More importantly, *ex ante* financing is critical for both the social risk and the commercial risk sharing. In both cases, structured rules that pay based on severity of the events should be used.

While other index insurance products (e.g., rainfall that impacts pasture and satellite images (the NDVI) of the grazing land) may be possible, mortality index insurance can be organized most quickly and potentially holds the greatest promise for compensating using principles of severity of loss by species. Nonetheless, enabling legislation should clear the way for using alternative index insurance as well. Ongoing work will determine how well other measures correlated with extreme mortality levels of adult animals. Should this work demonstrate strong relationships, rainfall and NDVI measures could also be used to make payments. More importantly, should these measures correlated strongly with livestock losses; they could be used as a form of reinsurance in the international reinsurance community. Mexico obtained reinsurance using weather indexes for their portfolio of crop insurance risk in 2001. More details on this arrangement are available upon request.

The major concern for mortality index insurance involves the quality of the estimates of mortality rates by species in sum. While some degree of measurement error is acceptable for index insurance contracts, systematic errors must be avoided. The incentives to systematically over report livestock deaths will be greater once indemnity payments are made on these data. This would be form of moral hazard by local officials who are responsible for reporting animal deaths. In general, a strong legal and institutional framework exists to mitigate this type of moral hazard. The *GoM* has emphasized the

importance of obtaining reliable estimates of both animal numbers and animal deaths for several decades. Existing laws that emphasize proper reporting for the census of animals are important for maintaining the integrity of the data used for payments. Some of the key points associated with development of the data are presented in a section below. In addition, a complete report on these issues is available from Enkh Amgalan.

Mortality index insurance has the following advantages:

- ✓ Low administrative cost as the payments would be made based upon existing government statistics that are already being developed each year (the census of adult animals in December and the mortality of adult animals throughout the year).
- ✓ Strong incentives for individual herders to continue to save their animals as they will not be paid based on individual losses, but rather the sum mortality rates. Saving the animals via good management must continue to be a priority for the *GoM.* Using a mortality index as the means of paying for losses rewards those who save their animals and does not give incentives to individuals to lose their animals during extreme events.
- ✓ On the commercial side, index insurance clears the way for innovation in the market as insurance provides can use the mortality index insurance as a form of local reinsurance to offer tailored products to herders in various regions.
- ✓ On the social side, index insurance provides a clear set of structured rules for making payments when severe losses of animals occur even down to the local level. The international community misses some local events that are severe as they do not capture international attention.
- ✓ As for economic development goals, index insurance can be used by development oriented NGOs and others who are trying to motivate improved risk mitigation by herders. NGOs could chose to either write the index insurance contracts themselves or pay some of the premiums for the BIPs as a precondition to organizing collective action on the part of local herders.
- ✓ Further toward economic development goals, index insurance can be used to facilitate more access to rural finance by groups or individual herders. Development groups that bring herders together to manage resources and to pool risk via microfinance or other cooperative efforts, simply cannot manage the correlated risk that come from major losses during a *dzud.* Index insurance contracts can serve to remove much of that risk from theses herder groups.

The Specific Recommendations

In the near term, legislation should be developed to open the way for index insurance products for livestock in Mongolia. This legislation should be enabling legislation with regulations that work out many of the details that will be recommended. First Initiative has a contracted Richard Carpenter to develop recommended draft legislation. Carpenter also drafter the broader Mongolian insurance law in the fall of 2003. The intent of the enabling legislation will be to provide the broad framework for using index insurance contracts for livestock losses with a defined role for the *GoM* and the markets. Details of

the precise contracts to be used and the precise way to implement these programs can be developed in the regulations that accompany the "Mongolian Livestock Insurance Law".

The enabling legislation should clear the way for the following activities:

1) A pool or Consortium of Market Providers (CMPs) that will offer and share risk on the government sponsored base insurance products (BIPs).
2) A government Risk Management Agency that will design and rate the BIPs and offer reinsurance for the CMPs.
3) Clear rules and authority to separate the functions of the RMA so that they can work both with the CMPs and with the social side for delivering the catastrophe insurance products to herders.

To facilitate the dual goals of providing risk management protection in the commercial sector and a social safety net in the public sector, it is recommended that the mortality index insurance be divided into 2 distinct components:

1) The commercial risk products would be facilitated with the BIPs that are sold and serviced by a member of the CMPs. For mortality index insurance this would be a simple product that begins paying when the mortality rate for a species reaches 10 percent within a sum. The BIPs would stop making payments at a CAP on the mortality rate (either 25, 30, 35 or 40 percent). For high risk sums and species, the BIP would stop payments at the lower levels. For low risk sums and species, the payments may go to 40 percent. Thus, the commercial products would pay what is called a 'layer of risk'. Herders would pay a fully loaded premium rate for these products.
2) The social safety net products would begin payments at mortality rates that exceed the CAP. In other words, the social product would begin paying where the commercial product stopped paying. This product will be called the Disaster Relief Product (DRP). Herders would be eligible for the DRP by simply registering the number of animals by species and sum. The payout structure would be the same as the BIP. However, as will be more fully developed below, the financing and full payments on the DRP would not be guaranteed as they are for the BIP. The *GoM* and the international donor community would promise to make as many payments as possible.

Specific Recommendations and Details for the BIP and the DRP

Data for 325 sums, for 32 years (1971-2002) and 5 species were supplied by the National Statistics Office with great assistance from the Center for Policy Research (CPR). These data were used to develop a very explicit insurance model. The model allowed for examination of numerous alternative approaches that would facilitate both the commercial risk management goal and the social goal for copying with the large losses created by *dzud* in Mongolia. The model uses the actual data for the 32 years to examine losses from alternative insurance contracts and also to aggregate these losses to make an estimate of what the exposure would be should events of the past be repeated today with the current spread of animals around Mongolia. A technical report is available to explain

these procedures. The research also included standard actuarial procedures for developing recommended loaded premium rates[1] for the BIP.

The Commercial Risk Product (the BIP)

The commercial insurance product is designed to make payments for relatively infrequent events but not for the most severe events. Thus, a layer of insurance is recommended for mortality rates between 10 percent and 30 percent. The CAP of 30 percent could be varied by relative risk, however, such a procedure would add complexity.

The nature of mortality risk by sum is quite unique. While 80 to 90 percent of the time, there are relatively small losses, some areas suffer moderate to extreme losses 10 to 20 percent of the time. On average, mortality rates exceed 10 percent about one out of every 10 years for all species. When over 10 percent of the animals in a sum are lost, one can expect that there is serious suffering. However, knowing what is extreme is quite difficult as mortality rates at 100 percent are possible. There is a very wide range between 10 and 100 percent mortality. Mortality rates beyond 30 percent are a 1 in 100 year event for most species. However, given the recent data, for cattle and yak mortality rates above 30 percent are a 1 in 30 year event. In any insurance market, the first rule is to 'never say never'. Thus, even though 70 percent of the sums have not had mortality rates in excess of 30 percent for sheep and goats, the simple fact that higher values are possible will lead to very large premium loads should a market provider attempt to insure for losses beyond some fixed mortality rate. The data are not good enough to know what the true risks are beyond certain mortality rates. This is called ambiguity risk in the market.

To avoid very large premium loads due to ambiguity risk, the BIPs will pay only for a range of losses between 10 and 30 percent mortality. The payoff function is also very straightforward and easy to understand:

Payout = 0
when morality rate is less than 10 percentage points

Payout Rate = Actual Morality – 5 percentage points
when morality rate is between 10 and 30 percentage points

Payout Rate = 30 – 5 or 25 percent
when mortality rate is at or greater than 30 percentage points

Payout = Estimated Value of the animals x Payout rate

Value of animals will be simply the product of the number of animals reported by the herder at the end of the previous year multiplied by the average value of the species by aimag. For example if a herder has reported 37 sheep in the aimag Khovsgol where the

[1] Should the *GoM* decide to move forward with the recommendations, one final step is need for the actuarial development. At the current time, the base rates are developed by sum and species with the implicit assumption that mortality rates are independent. Loaded rates account for some of the correlated losses. However, a final step is needed to 'smooth' premium rates across space.

value per sheep is approximately 27,000 Tg, the value insured would equal about 1,000,000 Tg[2]. Given a value of sheep equal to 1,000,000 Tg and the mortality rate is 20 percent in the sum, the payments will be calculated as follows:

Payout Rate = 20 -5 or 15 percent x 1,000,000 Tg= 150,000 Tg.

Premium calculations are also quite straightforward.

The premium rate is multiplied by the value of the animals to determine the premium payments. If the premium rate is 2 percent[3]:

Premiums paid = 1,000,000 Tg x .02 = 20,000 Tg

The 5 percentage points that are subtracted from the estimated mortality rate represent a type of deductible. The intent is to lower the transaction cost associated with making payments that are very small (i.e., less than a rate of 5 percent). The problem with such a contract design is that it can create some added incentives for moral hazard by local officials who report animal deaths. Such officials will have added incentives to 'adjust' mortality rates when the numbers are getting close to 10 percent. For example, if the local officials know that the rate is going to 8 percent, it may be easier to report numbers that get the rate to 10 percent since payments start at 5 percentage points. While such behavior is to be avoided, it is unlikely to be pervasive. Furthermore, such small numbers are unlikely to adversely impact the actuarial performance of the contracts. In the end, it is a judgment that avoiding the high transaction costs associated with making very small payments was more desirable than attempting to prevent some minor problems that may emerge because of the contract design.

Assuring that adequate financing is available to pay for the full scope of possible losses during major events, will require careful planning. These losses can be very large depending upon how many herders purchase the BIPs. However, regardless of how many herders purchase the BIPs, the indemnities paid out can exceed the premiums collected by five fold or more during a year like 2001. The *GoM* must play the role of reinsurer for these losses. More will be developed on this below.

The Disaster Relief Product (the DRP)

Since the BIPs will limit payments by using a CAP on mortality rates at 30 percent, it is necessary to consider what happens to losses beyond 30 percent. It is still possible to

[2] The value of the animals can be used as the maximum amount of insurance that can be purchased. However, herders should be allowed to purchase any amount less than this value. The calculations of premium payments and losses paid are simply the product of premium rate and payout rate times the value insured (liability). Allowing herders to purchase any amount below the estimated value of their animals will make the insurance more affordable for some herders.

[3] In true insurance terms, the maximum liability for the BIP is 25 percent times the value of the animals. Thus, premium rates for this layer of risk are actually 4 x the rates being used. The motivation for using this approach is that is a simple calculation and the fact that purchasing the BIP will automatically qualify the herder for the next layer of coverage from the government side. The maximum liability in this layer of coverage is much closer to the full value of the animals.

have losses well beyond 30 percent. In 2001, over 41 percent of the sums had cattle and yak losses that exceeded 30 percent. Other species had around 10 percent of the sums with losses in excess of 30 percent mortality in 2001. Such losses are very difficult to model for the commercial insurance products as they are infrequent and represent what is commonly referred to as 'ambiguity risk'.

A disaster relief product (DRP) is recommended for payments beyond 30 percent mortality. The same rules and information would be used to make the payments. However, herders can obtain this product with no premiums. For example, if the same herder represented above where herding the 37 sheep in a sum that suffered a 55 percent mortality rate, that herder could receive a DRP without purchasing any insurance. The DRP payment would be calculated as follows:

Payout rate= (55-30) -5 =20 x 1,000,000 = up to 20,000 Tg payment.

Again, the actual payments made would be constrained by available funds. Rules for how the funds would be allocated when they are not adequate to pay for all losses from the DRP pool must be developed. At the moment, the most straightforward rule would be to simply pro-rate the payments. Thus, if all losses from the DRP total US $ 20,000 million and the available funds total only $US 10,000 million, the payments for all individuals would be factored to 50 percent. In the case above, the herder would be paid 10,000 Tg rather than 20,000 Tg. Another way to allocate the funds would be to reset the CAP for all herders. Thus, an *ex post* second CAP might be set at some value like 45 percent. In this scenario, the government would stop payments when the mortality rate reaches 45 percent. For the example, above the payout would be the same as the 50 percent factor.

In either case, since the mortality is greater than 30 percent, if the herder purchases the BIP, the Payout rate would be at the maximum level of 25 percent. Thus, an additional payment of 25,000 Tg would be made from a member of the CMPs. This payment must be guaranteed with adequate financing.

The DRP will be a free catastrophic layer of risk protection that is provided by the *GoM* in junction with the international donor community. This product will facilitate *the social goal* of government. Funds for this product may or may not allow for full payments. As indicated above, the government must work out rules about how payments will be divided based on available funds. They can either go with the prorated rates or with a new CAP.

In the most catastrophic years, the international donor community will likely be needed to fund part of the DRP payments. The only obligation from herders is that they register the number of animals they are herding by species and sum before the year begins. This registry will be used to determine the value of payments for the DRP. Herders may be obligated to register their animals with a CMP member to give the BIP providers an opportunity to sell them the additional protection offered by the BIP or new products that they develop.

How can this structure spur the market?

It is believed that a *base insurance product* (BIP) can facilitate development of the private insurance sector in Mongolia. To do so requires a very careful structure that involves a clear role for government and a clear role for the market. The world experience in mixing government and markets to deliver agricultural insurance has not been good. Those in the market have every incentive to make money at the expense of the government. This form of 'rent seeking' can be mitigated by setting clear rules and organizing base products that are largely free of adverse selection and moral hazard. The government should not take the risk of bad management decisions or poor product designs that come from the private sector. This structure avoids these problems.

Some insurance providers in Mongolia may believe that the choice is either the index insurance or traditional approaches to insurance. In reality, by offering the BIP the government can clear the way for traditional approaches to insurance. The *BIP* can serve as a form of local reinsurance for innovative companies that desire to deliver traditional insurance that would pay herders. For example, some herders may only want insurance for their breeding stock. An insurance provider could have the herder purchase the *BIP* in the usual fashion, assign the indemnity payments over to the insurance provider and then, in turn, offer a limited coverage that would pay the individual for individual animal deaths as with more traditional livestock insurance. The indemnity payments from the *BIP* would serve to protect he insurer against widespread and correlated losses that come from major *dzud* events. Still, insurance companies would need to be extremely selective in such offerings as significant problems would remain in monitoring the herder to make certain that it is not bad management that creates losses. However, with this structure, that responsibility would rest solely with the private companies. The government has facilitated the risk taking by allowing them to have the herder assign the indemnity payments from the *BIP* over to the insurance provider. However, the government assumes no risk regarding the individual contract that the company sells the herder.

The Government Reinsurance Role and Expected Cost

Even though the most catastrophic risk will be eliminated by imposing a limit on payments for the BIPs at 30 percent, there are still significant large financial exposure risk remaining. This is because the livestock mortality problems are highly correlated as was already demonstrated by the number of animals lost from 2000 to 2002. Even when putting 32 years of data together for a spread of risk all across Mongolia, there are still large losses in the modeling work that has been performed. In the modeling work, the premium rates are loaded an average of 70 percent above the pure premiums. Still, there are 6 of the 32 years where indemnities would exceed premiums. Losses would have exceeded premiums by 2.5 times in 2000 and 2002 and 5 times in 2001. These are not insurable risk in classic insurance markets. Further, this is the profile of risk if every herder purchased the BIP for all species. Such a well-diversified portfolio of risk is not likely in the early years of the program. More likely some areas will have a larger percentage of herders purchasing the insurance than others.

To facilitate proper risk sharing, those selling the BIP must be able to pool their policies into the CMPs. The *GoM* will need to offer reinsurance for that pooled risk. Those firms

selling BIPs would pay the *GoM* the pure premium rate for reinsurance for their specific book of business. Net losses or gains from the total pooled book of business would be shared back with the firm's based on their portioned share of premium collected from herders. The *GoM* reinsurance would likely be in the form of a stop loss contract for the total pooled risk. In the early years, before the reinsurance fund has been built to any significant level, the stop loss would likely have to be offered at very low levels (e.g., 105 percent of the pooled book of business). As the fund builds, the government could offer higher levels and also begin to seek forms of reinsurance in the global markets.

To illustrate the potential losses for the *GoM* as a reinsurer providing a stop loss of 105, if all herders had purchased the BIPs for all species and the 2001 event repeated, the *GoM* would have paid in excess of US $ 63 million for the extra losses. The CMPs would have lost over US $ 4.5 million. With the 105 stop loss the companies would average nearly US $ 6 million in profits. In 7 of the 32 years, they would lose about $4.5 million. In the best 7 years, they would make over $10 million.

Importantly, one can expect that participation in the BIPs would grow relatively slowly. Even after a few years of activity, one would not expect more than 10 percent of the herders to purchase these contracts. Under these conditions, the 2001 event would create net losses for the *GoM* of around US $ 6 million. The companies would have maximum losses of roughly US $ 450,000. Over time, the government collects premiums from the CMPs. Thus, overtime the net cost to the government for the reinsurance service should be zero. However, careful planning is needed to assure that big payments can be made should the serious losses occur early in the offering – before a reinsurance fund is developed. The World Bank can offer contingent loans to the *GoM* in the early years to cover these risks. *In the early years, the maximum exposure should be significantly less than US $ 10 million.*

The Government Disaster Role and Expected Cost

Participation in the DRPs should be significantly greater than the BIPs. Herders would only need to register the number of animals they own by species and sum to qualify for this set of structured payments. For purposes of planning, it is reasonable to assume that only 50 percent of the herders will participate in this program in the early years. When modeling this risk, the government would be making some level of payment in every year. This is important as it emphases the fairness of this approach. In every year of the 32 years of data, there were at least a few sums where some species of livestock had mortality rates in excess of 30 percent.

Given 50 percent participation, one third of the time these cost should be less than US $ 40,000. The most likely cost is roughly $106,000. Twenty percent of the time, the cost would exceed $388,000. The three worst years would have been 2000 at $5 million, 2002 at $9 million and 2001 at $10 million. It should be obvious that there will be a complete overlap with the high cost years for the DRPs and the high cost years for the reinsurance service provided by the government. Thus, it is likely that the international donor community will be needed to help in making payments on the DRPs.

Background and Issues with the Livestock Census

The National Statistics Office (NSO) governs the livestock census. NSO *aimag* bureaus distribute the census guidelines to *sum* and *bag* governors. Mongolian law sets forth the requirements and responsibilities of recording livestock numbers.

- ✓ *Bag* governors have the responsibility of reporting livestock births and losses on a monthly basis
- ✓ Penalties may be imposed for misreporting or impeding livestock statistics.

Rules governing the counting process for the annual census are as follows:

- ✓ Counting must take place between December 7-17
- ✓ Counting must adhere to NSO guidelines, i.e. by eye counting
- ✓ All animals must be counted, regardless of ownership status
- ✓ Animals of absentee owners must be counted under the name of the herder who tends the herd

Temporary census commissions are established by *aimag* and *sum* governors to coordinate and conduct the census. Herders are to be given notice of when counting is to take place and are responsible for bringing their livestock together for ease of count. Livestock are to be counted by eye with signed confirmation from the owners. The livestock numbers are aggregated from the *bag* level to *sum*, *aimag* and then onto the NSO for national aggregation. The preliminary livestock count must be submitted to the government before January 5. The final report is due March 1. *Aimag* and *sum* governors may conduct half-year or quarter year census if necessary, though it is uncommon.

Livestock Losses

The national census tracks changes in the numbers of livestock, accounting for losses due to sales, theft, consumption, disease, and disaster. Individual herders are responsible for reporting losses to the bag officials. Losses include all animals that have died due to dzud or other natural disasters (e.g., flash flooding). Losses also include death of animals due to disease, theft of animals, and animals who have wondered off during storms never to return. While there may be some initial concern about including all of these numbers in the insurance index, this is not a problem. Since the insurance is an index and not individual insurance, there is no problem including even losses such as theft.

The State Standing Emergency Commission (SSEC) records livestock losses following natural disasters or disease outbreaks. Losses are recorded as needed between December and May. Losses are recorded every two weeks following natural disasters. The livestock losses recorded by the SSEC are used for disaster assistance and management purposes and are not used for statistical purposes.

Reporting Errors

Although the government has a protocol in place for complete and accurate recording of livestock numbers and mortality, there are institutional constraints that may reduce the accuracy of the census and mortality numbers.

The accuracy of livestock numbers is believed to be quite good and reliable. Taxation of livestock may discourage over-reporting of livestock numbers; however under-reporting can reflect badly on the herder and the community. Furthermore, local superstitions also enforce the notion that misreporting of the herd size will cause livestock deaths.

Livestock mortality is assumed to be less accurate as there are social incentives to understate losses. Large livestock losses can damage a herder's reputation. Local and national competitions for the coveted title of 'Best Herder' are awarded on the basis of the fewest livestock losses. Additionally, time and financial constraints limit the ability of *bag* governors to monitor each household's losses and certify each livestock death. Thus, monthly livestock losses are often a partial estimate. Also, because *bag* governors are appointed officials, they may be susceptible to the influence of their constituents to misreport livestock statistics. Transferring the responsibility of recording livestock to an independent, outside party should reduce the likelihood of this type of error. This may be needed as the BIPs are introduced.

Despite the errors that are currently present, some degree of error in the livestock mortality numbers is acceptable and should not grossly interfere with the pricing and payment of the BIPs as long as the error is randomly distributed. The current trend toward underreporting livestock losses may reverse however, with the introduction of an insurance product with indemnities based on reported livestock losses.
Indemnity payments would be dependent on the mortality rate of a *sum*. Enkh Amgalan reports that the livestock census numbers are thought to be accurate to within 1 percent. Some experts also suggest that mortality numbers could have measurement error as high as 20 percent when the losses are relatively low. This will introduce some bias in the payments. However, even these measurement errors do not present a serious challenge to the use of mortality index insurance as long as the measurement error is randomly distributed around zero. Furthermore, it must be kept in mind that there are no perfect insurance programs where the loss adjustment processes are free of measurement error.

Possible Roles for the GoM Risk Management Agency

- ✓ Design of the BIP(s)
- ✓ Premium rating for the BIP(s)
- ✓ Development of the official statistics to make payments for the BIP
- ✓ Building and maintaining the needed reserves to reinsure the CMIs.
- ✓ Collection of the reinsurance premiums from the CMIs.
- ✓ Payment of reinsurance to the CMIs when the pooled risk exceed specified stop losses (in the short term a stop loss at 110 percent of premium may be needed).
- ✓ Facilitation of sharing information so that the *GoM* can pay those who have purchased the BIP the extra catastrophe layer of risk.

Sample Language for Standard BIP Contract

DRAFT LANGUAGE FOR ILLUSTATION ONLY

This insurance is solely based on the official sum statistics on adult livestock losses for cattle and yak in sum Saintsagaan in aimag Dundgobi. The insurance will pay you when the mortality rate (the ratio of adult losses during the year 2004 divided by the total herd population at the beginning of the year) exceeds a rate of 10%. The payment will equal the estimated mortality rate – 5%. The maximum payment rate will occur when the mortality rate is equal to 30%. At that point, the payment rate will equal 25% of the value of your insurance. To be eligible, you must register for this insurance by June 1 of 2003. Registration involves a statement of intent to purchase and a reporting of your animal numbers at that time.

Value of Insurance
While we believe the average value of cattle and yak in the aimag Dundgobi to be about Tg 100,000, you may purchase any value of insurance between Tg 20,000 and Tg 100,000 per animal reported.

Paying Premium
You will pay a premium rate of 4% times the value of insurance you chose. The premium payment is due on January 1 of 2004. Should no payment be received by that time, we will cancel this insurance policy.

Paying for losses:
If the mortality rate for the sum of Saintsagaan in aimag Dundgobi exceeds 10%, we will pay you the product of the (mortality rate-5) times the value of insurance you have chosen. Please understand that you may have livestock losses when the sum mortality rate does not trigger a payment.

A final caveat on the new risk in Mongolia

The analysis for these products was performed as if the past 32 years will repeat themselves. It may be necessary to make premium rates a function of the stocking rates of animals. Quite clearly, the fact that animals were at record levels (over 33 million) in 1999 contributed to overstocking and the losses that followed. Thus, one can advance several arguments that the risks livestock deaths are now lower than they were in the recent past:

- ✓ Stocking rates are down (there are now 26 million animals rather than 33 million).
- ✓ Inexperienced herders have been forced out of the system.
- ✓ Numerous international donors, NGOs, and others have given attention to improved practices that mitigate the risk.