



**Technology Transfer Part 2:
The Voice of LEWS: Information Outreach
from the Gobi Forage Livestock Early Warning System**

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A series of droughts and winter disasters in Mongolia resulted in discussions between the United States Agency for International Development (USAID) and the Global Livestock-CRSP to transfer the GL-CRSP Livestock Early Warning System (LEWS) technology to Mongolia as risk mitigation for these extreme events. LEWS is a forage monitoring system that provides near-real time spatial and temporal assessment of current and forecasted forage conditions, along with an information and communication infrastructure that delivers the information for decision making to herders and other stakeholders. In 2004, the Gobi Forage project was initiated in the Gobi region of Mongolia using the blueprint from the GL-CRSP LEWS implementation, which was initially developed for the east African rangelands. Overall, the transfer of the general technology was successful, with the Gobi Forage team implementing the LEWS and forage quantity monitoring within two years, and forage quality monitoring shortly thereafter. The critical component for the success of Gobi Forage: delivery of LEWS forage quantity and quality information to herders and policy-makers has been most effective using maps delivered by the postal service, along with national radio broadcasts for early warning bulletins, in contrast to World Space Radio and Internet delivery utilized by the LEWS and LINKS projects in East Africa. The information outreach component of the program has been exceedingly well received at the local level, with over 70% of herders and nearly 64% of officials having some degree of familiarity with Gobi Forage products. Although considerable progress could still be made to improve information sharing at the national level, the transfer of LEWS to Mongolia in little over three years demonstrates considerable potential for the long-term impact of the program, as well as a fundamental case study for the benefits of livestock early warning systems in arid rangelands.

Background

During the period from 1999 to 2002, Mongolia experienced a series of droughts and severe winters that lowered livestock numbers by approximately 30% countrywide. In the Gobi region, livestock mortality reached 50% with many households losing entire herds (Siurua & Swift 2002). Due to these extreme losses of livestock and its impacts on pastoral livelihoods, discussions began in early 2003 between the GL-CRSP and the USAID mission in Mongolia to assess the possibility of transferring the Livestock Early Warning System (LEWS) technology developed in East Africa to Mongolia with the ultimate goal of providing timely information on forage conditions to increase lead time for risk mitigation decisions by Mongolian herders. In March 2004, the Gobi Forage project was implemented to apply proven LEWS forage and animal monitoring technology to pastoral communities in the Gobi region of Mongolia. The objectives of Gobi Forage were similar to those of the East Africa LEWS in that the primary emphasis was to develop a forage monitoring system that provides near-real time spatial and temporal assessment of current and forecasted forage conditions, along with an information and communication infrastructure to deliver the information for decision making to herders and other stakeholders. Under the Gobi Forage

program, the transfer of GL-CRSP LEWS technology had three major research activities including: 1) Infusion of forage monitoring technology developed by the GL-CRSP in East Africa to assess regional forage quantity; 2) Infusion of the near infrared reflectance spectroscopy (NIRS) nutritional profiling technology, developed in the USA and refined for early warning in East Africa, to assess livestock diet quality; and 3) Information delivery and outreach.

Gobi Forage represented the first attempt for the transfer of GL-CRSP LEWS technology from one pastoral region to another. The Gobi team began implementation of the Gobi Forage project in May 2004. For both the forage quantity and quality components of the program, the Gobi team sought to implement the protocols and methods developed in East Africa for information delivery and outreach.

The objective of this research brief is to provide an assessment of the successes, constraints, and lessons learned through the transfer of GL-CRSP technology developed in East Africa to Mongolia, and how this can be helpful in the transfer of this technology to other regions where drought early warning systems may be

needed. Part 1 of the brief (Angerer et al. 2009) describes the challenges associated with Activities 1 and 2 of the project: the transfer of forage monitoring and NIRS technology for use in the Mongolian version of LEWS. This brief, Part 2, investigates the issues, obstacles, and successes of the Gobi Forage project in delivering the benefits of this transferred technology for use by producers, traders, policy-makers, and development agencies throughout Mongolia, with implications for the use of LEWS technology in rangelands and pastoral areas outside of Asia and East Africa.

Major Findings

Information Delivery and Outreach

The general structure of information delivery for early warning products in Mongolia was similar to that developed in East Africa. The simulation model output for individual monitoring sites along with the 60-day forecast analysis was made available via Internet portal using the same software, databases, and analysis routines developed for the East Africa LEWS. For the map products, Gobi also used the geostatistical software and protocol developed for East Africa LEWS to create the *total forage available* and *deviation from long-term average* maps each half-month. However, delivery of the monitoring site and map information has been quite different in Mongolia. In East Africa, World Space radio download capability and the Internet were used to deliver information to monitoring zones where LEWS collaborators could access the maps and information and deliver it to stakeholders. The incentive to use World Space radios in East Africa is enhanced by the availability of other services such as the Africa Learning Channel. The World Space radio network is available in

A herder examines the Gobi Forage calendar. Photo by Dan Schar.



Mongolia via the AsiaStar satellite; however, the network is rarely used by herders and rural households. Also, there is no additional programming to provide incentives for multiple uses like in East Africa.

Internet access is scarce in most of the rural areas of the Gobi Region, although it has improved since the beginning of this study. Despite this improvement, Internet remains an unreliable means of transferring the maps due to the large size of the files and extended download time. Because of these limitations, Gobi Forage chose to use regular postal mail to deliver maps and situation reports to aimag (province) and soum (district) offices, so that the information could be seen by local government personnel as well as displayed on community bulletin boards. Gobi Forage also employed the use of national radio broadcasts to provide situation reports of current and forecast forage conditions. Information on livestock production is provided in these broadcasts, as well as occasional guest speakers to discuss rangeland management and highlight Gobi Forage products. The team has found this to be a very effective communications tool for delivery of Gobi Forage information, and the program has been exceedingly well received at the local level, with over 70% of herders and nearly 64% of officials having some degree of familiarity with Gobi Forage products. Almost all herder households and local/regional government officials have access to radios, and many schedule their activities where they can be near the radio when information on weather and livestock are scheduled during the day. A recent survey in the study region found that 65% of herders considered radio broadcasts as the most useful form of delivery for Gobi Forage information (Figure 1). In a similar survey of local and regional government personnel, the mailed maps were considered the best method for delivery of information (40%) followed by radio bulletins (32%) and the Internet (26%). Current information dissemination plans are to continue to use radio for communication to herder households and to continue delivery of maps for both postal and Internet delivery. Like East Africa, there has been a tremendous increase in the cell phone network in rural regions. The team is currently exploring methodology from the GL-CRSP Livestock Information Network and Knowledge System (LINKS) program for delivering spatially explicit early warning reports via cell phones and Short Message Service (SMS) technology.

As with the East Africa LEWS, the Gobi Forage project developed training programs for herders, government personnel, NGO's and other interested stakeholders in the use and interpretation of the LEWS products. Training in Mongolia was enhanced by the production of a set of DVD videos that were distributed, as well as shown, at the training sessions. These videos proved to be very effective tools for introducing potential users to the Gobi Forage program by providing a description of both the LEWS

methodology and products that are produced. Brochures, calendars, and descriptive maps have also been produced for distribution after training sessions to improve retention of information by trainees.

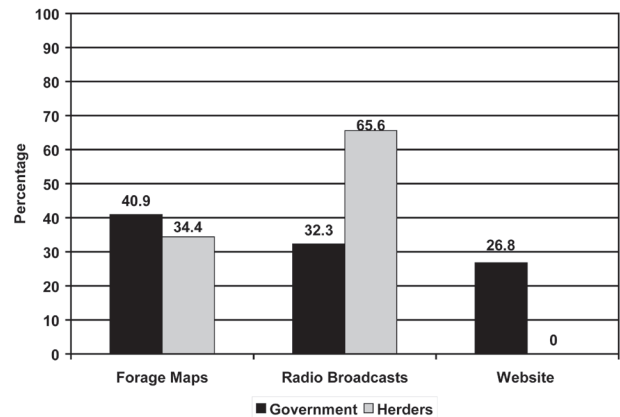
Partnerships, Capacity Building and Institutionalization

An overall major success of the Gobi Forage program was the partnership with USAID's Gobi Initiative that is being implemented by Mercy Corps. The Gobi Initiative is a rural development program designed to assist people in the Gobi region of Mongolia to undertake measures for developing and sustaining market-led economic growth. By partnering Gobi Forage with the Gobi Initiative, Gobi Forage was able to access the Mercy Corps network of program officers and personnel already located within the Gobi region. This was extremely helpful for establishing monitoring sites, implementing training sessions for herders and local government personnel, and receiving feedback on Gobi Forage products. Being located in Mercy Corps offices also provided needed infrastructure for vehicles, office space, and access to a variety of individuals including communication specialists, economists, veterinarians, and other specialists. This collaboration allowed a synergistic relationship to form between Gobi Forage and Gobi Initiative efforts in that the existing network and infrastructure allowed Gobi Forage to become operational in a short amount of time, while Gobi Forage products became an additional service provided to Gobi Initiative participants. The small disadvantage of the relationship was that due to Gobi Initiative efforts focused on herders/small business, government stakeholders were initially marginalized, and as a result, the Gobi Forage program has had to work hard to establish relationships with the government.

For capacity building of project personnel, Gobi Forage generally followed the same model as implemented in the East Africa LEWS: scientists from the US trained individuals in the host country and host country individuals traveled to the US for short term (4-6 week) training. It was found that having scientists travel from the US to do training in Mongolia was much more effective from a cost, logistical and retention standpoint. By sending US scientists to Mongolia to conduct training, the project was able to train a larger number of individuals, and train them in their own work environment. This reduced distractions and insured that the software and models worked on their machines. For training and study in the US, it was found that Master's level graduate training would probably be more effective than the short-term training.

Like East Africa, the presence of the Gobi Forage project has attracted other groups in the region to provide funding to enhance the LEWS coverage and sets of products. In 2005,

Figure 1. Percentage of the number of government personnel and herder respondents that answered "Yes" to the question of "What is the most useful form of delivery of Gobi Forage Information?" in a survey conducted in October 2007 in the Gobi Forage study area.



funding was received from the World Bank/Netherlands-Mongolia Trust Fund for Environmental Reform (NEMO) Khulan Project to expand the Livestock Early Warning System into the Dornogobi aimag to enhance their study of Khulan (Asiatic Wild Ass) movements and overlap with grazing livestock by herders in the region. This collaboration resulted in an additional 35 monitoring sites and an eastward expansion of the study area (Angerer et al. 2009). In 2006, Gobi Forage received additional funds from the World Bank Sustainable Livelihoods Program to expand the LEWS into the Tuv aimag surrounding Ulaan Baatar, the largest city in Mongolia and the nation's capital. This resulted in the addition of 50 new monitoring sites and expanded the project region northward (see Angerer et al. 2009).

Practical Implications

The success of a technology suite like LEWS with the capacity to forecast drought and other potentially devastating climatic events, and forewarn policy-makers, managers, and herders so that they can take action to mitigate risk associated with these events is fundamentally dependent on the ability of program staff and collaborating partners to deliver the information produced by the technology to those most affected. In little over three years, Gobi Forage has not only managed to integrate East Africa LEWS and forage quality monitoring technology into Mongolia, but also to establish a series of protocols and information delivery systems designed to reach both herders and officials at the local and national levels. In a recent survey and evaluation report conducted on Gobi Forage, "nearly half of herders surveyed reported that they had used Gobi Forage information in the preceding months to guide livestock movements, provide supplementary feed and change their rotational grazing strategy; 35% of these herders reported a net profit resulting from these actions. The overwhelming majority (93%) of government officials

using Gobi Forage products to advise herders indicated that the products were ‘very useful for their work.’” While challenges still remain (notably trainings for herders on information interpretation and improved information sharing at the national level), given the time frame, Gobi’s outreach activities are considered remarkably efficient.

Furthermore, providing a core set of personnel, infrastructure and funding for LEWS in East Africa and Mongolia has been very beneficial for attracting other donors to fund expansion of the program. This not only has increased the capabilities of the Gobi Forage system, but has provided increased opportunities for the longer term sustainability of the projects. It is this long-term sustainability that is viewed as critical to ensuring continued progress and development of livestock production and management in pastoral rangelands. For long-term sustainability of LEWS technology in both East Africa and Mongolia, institutionalization of these programs within the host countries needs to occur, preferably as part of

a government ministry or academic institute that can devote long-term funding for staffing, production, and maintenance of the system. In Mongolia, the funding provided by the GL-CRSP, the USAID Mission, USDA-RASP, and other partners during the last 3.5 years has allowed the LEWS system to become operational in almost half of the country, and has created widespread awareness and use of the products. It remains to be seen, despite the considerable efforts on outreach of the Gobi Forage program, if this length of time has been adequate to create the demand from users (herders, livestock producers, and local, national and regional government officials) for the products to encourage government and/or other donors to provide this funding. Currently, a request for applications has been opened to identify an appropriate institution for housing the Gobi Forage program for long-term sustainability. The authors expect this process to be complete by Spring 2008. *Editors note: at the time of printing, this process remains ongoing.*

Further Reading

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The GOBI FORAGE project was initiated in 2004 to adapt Livestock Early Warning System (LEWS) technologies developed by the GL-CRSP in East Africa for Mongolia to improve risk management by herders and other stakeholders in the Gobi Region of Mongolia. The project is a partnership between the Global Livestock CRSP, the USAID-Mongolia Mission, Texas A&M University, Mercy Corps Mongolia, and USDA Rural Agribusiness Support Program, and is managed by Jay Angerer. Email contact: jangerer@cnrit.tamu.edu.



The Global Livestock CRSP is comprised of multidisciplinary, collaborative projects focused on human nutrition, economic growth, environment and policy related to animal agriculture and linked by a global theme of risk in a changing environment. The program is active in East and West Africa, Central Asia and Latin America.

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