GLOBAL LIVESTOCK CRSP

Climate Forecasting for Pastoralists?

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A survey was conducted during 2001 among 323 pastoral and agro-pastoral households in northern Kenya and southern Ethiopia to assess the use and value of "modern" versus "traditional" forms of seasonal climate forecasts in remote areas. Conventional wisdom suggests that forecast information should be very useful for pastoral risk management since accurate predictions could help herders move stock and hedge household risks in a timely fashion. Modern forecasts were received by about 20% of households and this was largely via radio. The vast majority (80%), however, received forecasts generated from various traditional methods, and respondents noted they typically had a high degree of confidence in these predictions. There were several forecast variables of importance to our respondents, but knowing the start date for the rainy season was regarded as most valuable. They said that forecasts are most useful if they could be received with from four to 10 weeks lead-time. Traditional forecasts for rainfall volume for the long rains of 2001 varied from the modern forecasts of the Nairobi-based Drought Monitoring Centre. The Ethiopians tended to be more pessimistic than the Kenyans. Despite a stated confidence in traditional forecasts, few respondents appeared to act on the basis of any rainfall predictions. Cultivators were more likely to respond to predictions of above-normal rainfall, while herders tended to act in response to resource-based, eyewitness scouting reports. There has been a recent upsurge in interest among donors and development agents in improved forecasting and dissemination of seasonal climate information, but our evidence suggests that the anticipated impact of such interventions in pastoral areas may be less than is commonly assumed.

Background

The emergence of sophisticated climate modeling and its apparent successful use in cueing humanitarian efforts that averted drought-related crises in southern Africa has prompted significant interest in climate forecasting for the Greater Horn of Africa. Early warning systems are being developed with the thought that climate forecasts might help pastoralists mitigate risk more skillfully, thereby helping avert crises.

Yet, there is a dearth of empirical evidence as to pastoralists' access to, confidence in, or use of emerging climate forecast information. In the interest of trying to help fill that important empirical gap, just prior to the onset of the 2001 long rains in March we fielded the first round of a brief household survey module on climate expectations and use of climate forecast information. Our goal was to better understand pastoralists' awareness of, access to, and confidence in seasonal forecasts, both locally-based or "traditional" and externally generated or "modern," and to assess the current and potential value of seasonal climate forecasts for pastoralists at their current skill levels. We

surveyed 323 households across 11 PARIMA research sites and complemented the survey with open-ended, qualitative research to establish prevailing indigenous climate forecasting methods.

Preliminary Findings

In spite of the rapid growth of climate forecasting in the region and efforts at widespread dissemination of seasonal climate forecasts by institutions such as the Drought Monitoring Centre (DMC) in Nairobi, survey responses indicate that less than 20% of our study households receive modern climate forecasts. The overwhelming majority of these households access modern forecasts via radio. Newspapers, television, and government or NGO extension services reach a negligible portion of survey respondents with climate forecast information.

Our households nonetheless hear seasonal climate forecasts, as more than 80% received information based on traditional methods including reading clouds, stars, the moon, livestock intestines, and by observations of livestock and wildlife behavior. Typically, our respondents received traditional forecast information from several sources. For example, 54% of households received information from at least four different sources for the long rains of 2001.

Our respondents consistently ranked the start date for the rainy season as the climate variable of greatest interest, followed by the amount of rainfall in their home area, the end date or duration of the rainy season, and the rainfall amount in areas where they might migrate. For a climate forecast to be useful, our respondents living in drier locales reported that they must receive a forecast with a lead-time of at least four to five weeks. Where water is more accessible and cultivation practiced, respondents noted a need for an even longer lead-time of eight to ten weeks.

Confidence in all forms of forecasting markedly varied, but on average, confidence in traditional sources far exceeded that for modern sources (Table 1). More than three-quarters of respondents expressed confidence in traditional forecasts—over three times greater than that for modern forecasts. These averages mask variation across forecast variables and locations. Ninety percent of respondents had at least some confidence in the accuracy of traditional start-date forecasts versus 39% for the modern variety. Seventy-five percent of respondents had at least some confidence in traditional forecasts of local rainfall quantity, with only 38% expressing confidence in modern forecasts. There was also much site variation, although confidence in traditional forecasts significantly exceeded that for modern forecasts in 10 of 11 survey locations (Table 1). In general, confidence in modern forecasts was greater for respondents in Kenya compared to those in Ethiopia.

Modest awareness of, and limited confidence in, modern climate forecasts gives rise to rainfall expectations among our respondents that

Table 1: Overall confidence in forecasts, by type & site

	Traditional	Modern
Overall	**77%**	**23%**
Ethiopia		
DH	**89%**	**11%**
DI	**97%**	**3%**
FI	**97%**	**10%**
WA	**73%**	**27%**
Kenya		
DG	**72%**	**17%**
KA	**90%**	**7%**
LL	**23%**	**77%**
NG	**77%**	**23%**
NH	**62%**	**34%**
SM	**75%**	**25%**

Overall confidence levels reflect simple means of measures with respect to rains' start date, end date, local rainfall volume, and rainfall volume elsewhere.

Ethiopian sites: DH=Dida Hara, DI=Dillo, FI=Finchawa, WA=Wachille
Kenya sites: DG = Dirib Gumbo, KA=Kargi, LL=Logologo, NG=Ngambo, NH=North Horr, SM=Suguta Marmar

Table 2: Stated probability of rainfall volume for long rains of 2001

	Above Normal	Normal	Below Normal
DMC: Kenya	25%	40%	35%
All Kenya	41%	36%	20%
DG	25%	39%	36%
KA	35%	31%	27%
LL	13%	59%	24%
NG	51%	33%	13%
NH	61%	25%	11%
SM	63%	30%	9%
DMC: Ethiopia	35%	40%	25%
All Ethiopia	19%	31%	48%
DH	21%	64%	14%
DI	0%	0%	100%
FI	0%	30%	70%
WA	53%	43%	3%

Sites are the same as in Table 1.
DMC = previously published Drought Monitoring Center forecasts

significantly differed from computer-modeling forecasts published by the DMC for the 2001 long rains—these forecasts had been released before our survey began. We elicited probabilistic forecasts of rainfall volume from our respondents in a form directly comparable to the DMC forecast probability of above normal, normal, or below normal rainfall for the calendar. Most of the Kenyan respondents were significantly more optimistic than the DMC forecasters that 2001 would bring above-normal rains (Table 2). Our Ethiopian respondents, in contrast, were more pessimistic even though the DMC provided more optimistic predictions for southern Ethiopia compared to those for northern Kenya. Deviations of rainfall expectations between traditional versus modern forecasts further underscore the general inattention paid to modern forecasts among pastoralists and agro-pastoralists in our study region.

The biggest issue surrounding the potential, as distinct from current, usefulness of climate forecasting for our respondents concerns their use of the information. Information is valuable only in so far as people are willing and able to act on it. Even though the overwhelming majority of our respondents are aware of, and have confidence in, climate forecasts—albeit mainly traditional ones—only a minority act on that information, especially when the forecast calls for above-normal rainfall. Once again, there is much variability across space. A majority of households in relatively wetter, agro-pastoral sites reported that they make cultivation decisions on the basis of above-average rainfall expectations. These same households tend to take rainfall expectations into account when making herd management decisions, although their response to climate forecasts is stronger with respect to cultivation practices than to herd management practices. In general, it appears that cultivators are far more inclined to use climate forecast information than are herders. Pastoralists move their herds based on scouting reports of realized rainfall and range conditions, not on the basis of forecasts.

Practical Implications

The 1998 El Niño floods and the severe 2000 drought have piqued widespread interest in the potential role for emerging climate forecasting technologies in mitigating natural disasters in the dry lands of the Greater Horn of Africa. Preliminary results from a new survey of pastoralists and agro-pastoralists in southern Ethiopia and northern Kenya suggest, however, that climate information is not an especially limiting factor in these populations' struggle to survive. Few of our respondents access, have confidence in, or use modern climate forecasts. Most do not even use the traditional forecasts in which they express at least some confidence. This evidence calls into question arguments that improved production and dissemination of climate forecasts should be a high priority investment as donors and governments strive to reduce pastoralists' vulnerability to climate-related shocks.

Further Reading

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The GL-CRSP Pastoral Risk Management Project (PARIMA) was established in 1997 and conducts research, training, and outreach in an effort to improve welfare of pastoral and agro-pastoral peoples with a focus on northern Kenya and southern Ethiopia. The project is led by Dr. D. Layne Coppock, Utah State Univeristy, Email contact: lcoppock@cc.usu.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 Africa, Central Asia and Latin America.

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