



Risk Ranking in Northern Mali

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Livestock producers in sub-Saharan Africa face a great deal of risk, and have long established coping mechanisms to manage these risks. A goal of GL-CRSP Mali Livestock and Pastoralist Initiative (MLPI) risk management research in 2008 was to identify the kinds of risks residents of Tenenkou cercle, an administrative subdivision of the Mopti region in Mali, identify as most prominent. The Inland Niger Delta, found within the Mopti region, represents an important dry season pasture resource for a significant fraction of Mali's livestock population. We also sought to understand how assessments of risk could vary across sites, seasons, livelihood groups, and gender. In this preliminary approach to the issue, we conducted open-ended interviews with groups of people in an area known in great depth by one member of the research team (Turner). This initial approach was designed to address a second goal of MLPI preliminary research, which was to understand how to pose questions in a larger risk management survey fielded in 2009. Findings from the preliminary approach indicate that there are some similarities and contrasts between the risks identified in the GL-CRSP PARIMA project East African study and the current Mali study, while the main differences between the two areas would appear to be related to the higher reliance on markets in East Africa and the greater reliance on cropping within the Malian study population. The impression left by these findings is that risk perceptions in Tenenkou may in fact vary more within a geographically defined community than was the case among the PARIMA study population in Kenya and Ethiopia. While there is heterogeneity within communities in the East African sample, it would appear that the social complexities are much more pronounced in the Inland Delta of Mali. These preliminary findings led us to initiate a broader study of risk management in the MLPI study area designed to be consistent with work done by the Consultative Group for International Agricultural Research's (CGIAR) Systemwide Livestock Program, which ran similar risk surveys in Niger and Kenya. Results based on this comparative work are expected to be generated in 2010.

Background

Livestock producers in sub-Saharan Africa face a great deal of risk, and have long established coping mechanisms to manage these risks. A goal of the Mali Livestock and Pastoralist Initiative (MLPI) risk management research in 2008 was to identify the kinds of risks residents of Tenenkou *cercle*, an administrative subdivision of the Mopti region in Mali, identify as most prominent. The Inland Niger Delta, found within the Mopti region, represents an important dry season pasture resource for a significant fraction of Mali's livestock population. We also sought to understand how assessments of risk could vary across sites, seasons, livelihood groups, and gender.

A core issue confronted when conducting a study of risk perceptions is the meaning of 'risk' in a particular context. How do people understand risk and vulnerability, and in a related fashion, what words do they use to describe these concepts? We found three core challenges in approaching the question of risk perceptions in the Tenenkou area.

First, the idea of an individual's risk exposure was hard to linguistically isolate from the idea of an individual's risky behavior. The closest translation of exogenous

risk is the "work of God" (*golle Allah*). Phrased in this way, it proved somewhat difficult to talk about how people's actions expose them to differential exogenous risk. The literal translation of risk is associated with an individual's endogenous behavior, in the sense that bad outcomes are the result of bad choices, as compared to covariate exposure to exogenous shocks, in the sense that bad outcomes are a reflection of the bad luck that comes to us all and sometimes comes to us all at the same time. A second linguistic issue was that risk is tied up in the idea of 'problems'. Some of the items people would identify as risks are not shocks in and of themselves as viewed by a stochastic concept of risk (a good example was people complaining about the discomfort brought on by the cold of the cold-dry season), but are related to what can be thought of as a shock that can result from the predictable problem of a cold period (there was a sense that the cold was tied to the likelihood of falling ill in this season, where illness is in a probabilistic sense a shock). A third issue was that any time you have people from outside showing up in a Land Cruiser who have come to ask about 'risks', you are bound to get people thinking instead about a related but distinct concept of 'needs'. Responses at times were clearly motivated by a

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desire for external funding to solve a particular problem (for example, people would cite as a risk a lack of farming equipment, a lack of seeds, or the need for an improved road to the women's garden because the current one is underwater following the rains).

Methods

In a preliminary approach to understanding risk in Tenenkou in light of these issues, we conducted open-ended interviews with groups of people in an area known in great depth by one member of the research team (Turner). For the interviews, we assembled groups of people from different backgrounds in different communities. Different groups were assembled based on their livelihood priority (livestock husbandry, farming, blacksmiths, and fishing), production landscape (on and off of the floodplain) and gender. Despite the fact that there are clear distinctions in livelihood identities, all groups depend on farming (rice and millet farming, on and off of the floodplain, respectively). These were not particularly formal meetings, and there were often people coming and going over the course of the discussion. After explaining the purpose of the visit, asking for the assent of the group to conduct the questions, and thanking them for taking the time to talk with us, we went forward with a set of questions about risk perceptions in the area.

We divided the year up into the four seasons represented in the local Fulfulde language: a rainy season = *ndungu*, a short hot dry season = *yaounde*, a long cold dry season = *dabbunde*, and a long hot dry season = *ceedu*. We combined *ndungu* and *yaounde* into a single season, as *yaounde* is only a month long and seemed to face many of the risks described for *ndungu*.

Following the seasonal division, we asked the group to list all the risks they could think of for the given season. After writing down all group responses, we asked them to rank the listed responses beginning with the biggest problem, and continuing on to the smallest problem. Our list was restricted to the top five responses if there were over five given for a season. This exercise was continued until completing the risk rankings for all three major seasons (*ndungu*, *dabbunde*, *ceedu*). We then asked participants to think of the top response for each season in an annual context. How would they order the top problem for each season in terms of the top problem faced over the course of an entire year?

Findings

Given the context described above, these results are of course to be treated with caution. The groups were ad hoc, the size of the group went from one person to over 20, and in the larger groups the total number is probably

Table 1. Top ten overall risk ranking scores.

Risk	Average Score
Lack of food	0.34
Human sickness	0.26
Birds attack crops	0.20
Animal sickness	0.18
Lack of water	0.18
Weather issues	0.17
Farmer-herder conflict	0.13
Rains fail	0.08
Flooding problems	0.07
Lack of pasture	0.07

misleading, as the data collected often reflect only the input of a few members, and the understanding of the question differed across and within groups. There are clearly some significant problems to our methodology, mainly arising from the short-term and exploratory nature of the study; it was in essence a week-long preliminary field investigation.

The risk rankings are put on a [0,1] scale by normalizing by the number of items ranked, as was done in the GL-CRSP Improving Pastoral Risk Management on East African Rangelands (PARIMA) project studies reported in Smith et al. (2001) and Doss et al. (2008). One always refers to the top ranked item, while zero refers to an item that was not ranked or noted. The number assigned to something ranked (other than the top item or not at all) depends on the total number of items ranked. For example, if there are three items ranked: 1 = score for top ranked item; 0.67 = score for item ranked number two; 0.33 = score for item ranked number three; 0 = score for all other items.

First, we can consider the overall average risk ranking results. In Table 1, we have pooled all the results by season, after grouping related responses into categories. The averages are calculated for all groups over all seasons.

One important finding is that there are some similarities and contrasts between the risks identified in the PARIMA East African study and the current Mali study. Doss et al. (2008) report the top five risks as: food shortages; human sickness; lack of pasture; high prices for things you buy; and animal sickness. In this study, the top five are: lack of food; human sickness; birds attacking crops; animal sickness; and a lack of water. The main differences between the two areas would appear to be the higher reliance on markets in East Africa and the greater reliance on cropping within the Malian study population. That would match the fact that the Inland Delta is a productive flood plain where cropping is of high importance, compared to the

Table 2. Top five risk ranking by season.

	Rainy Season (<i>Ndungu</i>)	Cold Dry Season (<i>Dabbunde</i>)	Hot Dry Season (<i>Ceedu</i>)
1	Human sickness	Weather issues	Lack of food
2	Birds attack crops	Farmer-herder conflict	Lack of water
3	Lack of food	Human sickness	Lack of pasture
4	Animal sickness	Flooding problems	Animal sickness
5	Rains fail	Low prices for things you sell	Brush fires

East African rangelands of the Doss et al. study, where cropping is a minor activity.

There is some pronounced seasonality to these rankings revealed by further analysis. The top five risk ranks by season are reported above in Table 2. First, most of the risk seems associated with the hot dry season (*ceedu*) and the rainy season (*ndungu*). The cold dry season of *dabbunde* that follows the rains is generally seen as somewhat benign though chilly.

We also can report that there is evidence for inter-group differences in risk perception. One aspect of this is potential gender differences. Focusing just on the risk ranks for the groups of women, we have an indication that women may rank risks differently than men. In addition, women in the open-ended question suggested that this would be the case. It remains to be seen whether it is true using more rigorous methods, but there are indications that risk perceptions may be influenced by gender. Note that we also found that gender differences appeared to matter in the first risk study in East Africa (Smith et al. 2001) that were not eventually supported by the individual level surveys (Doss et al. 2008). This was probably because the first study interviewed groups in different communities, and interviewing a women's group in one community and a men's group in another community ran the risk of interpreting as a gender difference what could be a community level difference. In

contrast to Table 1, however, Table 3 displays evidence that women's groups have different risk ranking patterns, with health being more pronounced, and birds attacking crops being much less pronounced.

There were also clear differences in risk perceptions based on livelihood strategies combined with a person's background. The fishing communities had very clear concerns about the riskiness of fishing, though within the fishing community, some groups had stronger rights to fishing areas than another, which influences their risk perceptions. Rice cultivators had a set of rice-specific concerns, which were similar, though not identical, to the concerns of millet farmers. However, the millet farmers (who live beyond the high water mark of the Niger Delta floodplain) had a whole other set of concerns based on supplying fuelwood to the towns during the dry season (an important cash-earning activity for this group during the dry season).

Practical Implications

The impression left by these preliminary results, is that the risk perceptions may in fact vary more within a geographically defined community than was the case in the PARIMA project's East African study population. While there is heterogeneity within communities in the East African sample, it would appear that the social complexities are much more pronounced in the Inland Delta of Mali. While it may turn out that within social groups we find more homogeneity of risk perceptions, as an operating hypothesis we speculate that there is likely to be more variation within a geographically defined community in the Malian context than we found in the Ethiopian and Kenyan context, where there was relatively less diversity in livelihood strategies. While the Inland Delta is known for its social heterogeneity, other parts of Sudano-Sahelian West Africa may still show greater heterogeneity than found in the East African case since it is much more common for "communities" to be composed of social groups (casts, ethnicities, lineages) with a range of livelihood identities.

The findings of this study led us to design a broader study of risk management in the Malian study area. This was designed to be consistent with work done by the

Table 3. Top ten risk ranking for groups of women.

Risk	Average Risk Rank
Human sickness	0.43
Lack of water	0.34
Lack of food	0.33
Weather issues	0.20
Low prices for things you sell	0.15
Animal sickness	0.11
High prices for things you buy	0.11
Flooding problems	0.11
Housing issues	0.09
Birds attack crops	0.09

Consultative Group on International Agricultural Research's (CGIAR) Systemwide Livestock Program. The CGIAR project ran similar surveys in Niger and Kenya. We adapted their questionnaires to be applicable to the northern Mali

study area in order to maintain comparability with cross country differences, while ensuring the questions made sense to Malian respondents. Results based on this comparative work are expected to be generated in 2010.

Further Reading

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Building on the successes of the GL-CRSP Livestock Early Warning System/Livestock Information Network and Knowledge System (LEWS/LINKS), Improving Pastoral Risk Management on East African Rangelands (PARIMA), and Forage Monitoring Technology to Improve Pastoral Risk Management by Herders in the Gobi Region of Mongolia (GOBI Forage) projects, the Mali Livestock and Pastoralist Initiative (MLPI) was initiated in January 2008, to develop a livestock market information system, and to examine strategies for reducing risk and improving livestock marketing options for the enhancement of pastoral livelihoods in Mali. The project is a collaboration between the Global Livestock CRSP and the USAID Mission to Mali, with Texas A&M University and Syracuse University as the US implementing partners. The project is led by Dr. Jay Angerer, Texas A&M University. Email: jangerer@cnrit.tamu.edu. The Co-Principal Investigator is John McPeak. Email: jomcpeak@maxwell.syr.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, and Central Asia.

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