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USAID/MALI CLIMATE CHANGE ADAPTATION ACTIVITY (MCCAA)

BEHAVIORAL BASELINE SURVEY FINAL SYNTHESIS REPORT

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USAID/MALI CLIMATE CHANGE ADAPTATION ACTIVITY (MCCAA)

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Table of Contents

Acronyms	1
Introduction	1
Behavioral Baselines: Methodology	1
<i>Data Collection</i>	3
<i>Preparation for Analysis</i>	5
<i>Analysis</i>	6
Behavioral Baselines.....	10
1. <i>Toumadiama: ML09: West and Central Rainfed Millet/ Sorghum</i>	11
2. <i>Gomou: ML13, Center-Eastern Millet and Livestock</i>	17
3. <i>Dobolo: ML05: Dogon Plateau – Millet, Shallots, Wild Foods and Tourism</i>	24
4. <i>Guile and Sare Mala: ML06/06a: Niger Delta Rice, Cattle, and Fishing/Bozo Fishermen</i>	31
Other Major Findings and Lessons Learned	39
<i>Identity, Livelihoods, and Vulnerabilities</i>	39
<i>Identity, Livelihoods, and Interventions</i>	40
References.....	48
Appendix I: Codebook Details.....	(attached separately)

Acronyms

AAH	adequate access household
FEWS-NET	USAID Famine Early Warning System Network
FTF	Feed the Future
HADL	high asset diversified livelihoods
HAH	high asset household
HURDL	Humanitarian Response and Development Lab at Clark University
LAH	low asset household
LIG	Livelihoods as Intimate Government
MCCAA	Mali Climate Change Adaptation Activity
ML	minor lineage
NFE	non-farm employment

Introduction

Between November 2015 through the end of September 2016, the Humanitarian Response and Development Lab (HURDL) at Clark University undertook the data collection and analysis for a behavioral baseline survey of five implementation zones targeted by the Mali Climate Change Adaptation Activity (MCCAA). The goal of a behavioral baseline is to establish the logic of livelihoods decision-making in a particular place such that implementers can identify:

- 1) *Who is vulnerable to what shocks and stressors:* within an implementation zone as broad as Mopti, or indeed any of the livelihoods zones within Mopti, there are many individual experiences of vulnerability. The behavioral baseline organizes these experiences of vulnerability into coherent patterns.
- 2) *Why particular individuals have particular vulnerabilities:* vulnerability is the product of 1) individual *exposure* and 2) *sensitivity* to a shock or stressor, as well as 3) their *ability to adapt* to that shock or stressor. These three components of vulnerability are all closely tied to livelihoods.
- 3) *Whose vulnerabilities are most likely to be impacted by a particular intervention:* the sources and particular manifestation of vulnerability can vary within communities and even households. It is therefore critical to understand whose vulnerabilities, and what aspects of those vulnerabilities, will be impacted by a particular intervention – both to select appropriate interventions to address the challenges at hand, and to contextualize evaluations of those interventions over time.
- 4) *The behavioral impact of the intervention:* while interventions often can be associated or even correlated with observed changes in livelihoods activities or other behaviors, establishing an explanatory understanding of how that intervention produced an observed change is critical to evaluating the pathway of impact (which can establish the degree to which a particular impact is replicable through this intervention in another site) and the sustainability of the impact (is the change in observed behavior the product of a shift in the logic of livelihoods underlying that behavior, or is it merely a response to the presence of an intervention that could disappear at project end).

This report begins with a discussion of the methodology and execution of the data collection for the behavioral baseline, as well as the approach to data coding and analysis that produced the project findings. It then turns to a summary of zone-specific behavioral baselines. Finally, it concludes with a discussion of cross-zone patterns and lessons.

Behavioral Baselines: Methodology

Establishing a behavioral baseline, which is an understanding of existing logics of livelihoods decision-making in a particular place, requires a general theorization of livelihoods behaviors. HURDL focuses on livelihoods decision-making to establish these baselines because, as Gaillard (2010: p. 221) argues,

(a)ssets and resources essential in the sustainability or un-sustainability of livelihoods are conversely crucial in defining vulnerability. Such an intimate relationship between livelihood and vulnerability justifies that many people have no other choice but to face natural hazards to sustain their daily needs.

HURDL's Livelihoods as Intimate Government (LIG) approach (Carr 2013; Carr 2014b) expands the conceptualization of livelihoods from its contemporary, narrow framing as a means of making a living, returning to its initial framing as the way that people live in a particular place (for discussion of the history of livelihoods approaches, see Scoones 2009; Scoones 2015). LIG frames this "way of living" as more than activities aimed at obtaining assets and resources necessary for material well-being. Instead, livelihoods are a means of "governing" the world, setting people and things on a path toward a particular set of goals. Those goals might vary within a community or household, and might change over time. However, in all efforts to understand the logic of livelihoods in a particular place, we must move beyond simple assumptions about material well-being and the motivations for individual choices to recognize that while livelihoods govern the material world, they also govern the social world in which different actors live.

In LIG, efforts to govern the world emerge at the intersection of three conceptual domains: discourses of livelihoods, mobilization of identity, and tools of coercion. Discourses of livelihoods are the language and actions that reflect different actors' perceptions of the vulnerability context and the appropriate means of managing it in their everyday lives as they seek to achieve particular goals (income, empowerment, happiness, etc.). Identity references the roles and responsibilities associated with different subject positions within communities or households, such as those associated with men and women. LIG focuses on the mobilization of identity not because identities are produced by livelihoods strategies. Instead, identities are referenced as explanations for "appropriate" livelihoods roles and decisions that bring forth the self-interest of the individual. Tools of coercion are the locally legitimate institutional and social means by which some in a community or household can alter or affect the behaviors and choices of others. These three spheres overlap significantly, but in different ways for different people in different situations. Through everyday life practices that bring these three spheres together, these discourses, identities, and tools of coercion become 'social facts' (Gidwani 2001: 79) that define fields of possible action and thought. These fields of thought are what we must understand to explain observed livelihoods decisions and outcomes. This framing of livelihoods decision-making has proven effective in assessing farmer interest in weather and climate information (Carr 2014a; Carr, Onzere, et al. 2015; Carr and Owusu-Daaku 2016; Carr, Fleming, and Kalala 2016) and rural communities' needs for hydrometeorological risk early warning (Carr, Abrahams, et al. 2015), and represents the cutting edge of livelihoods research today (for discussion, see Carr 2015).

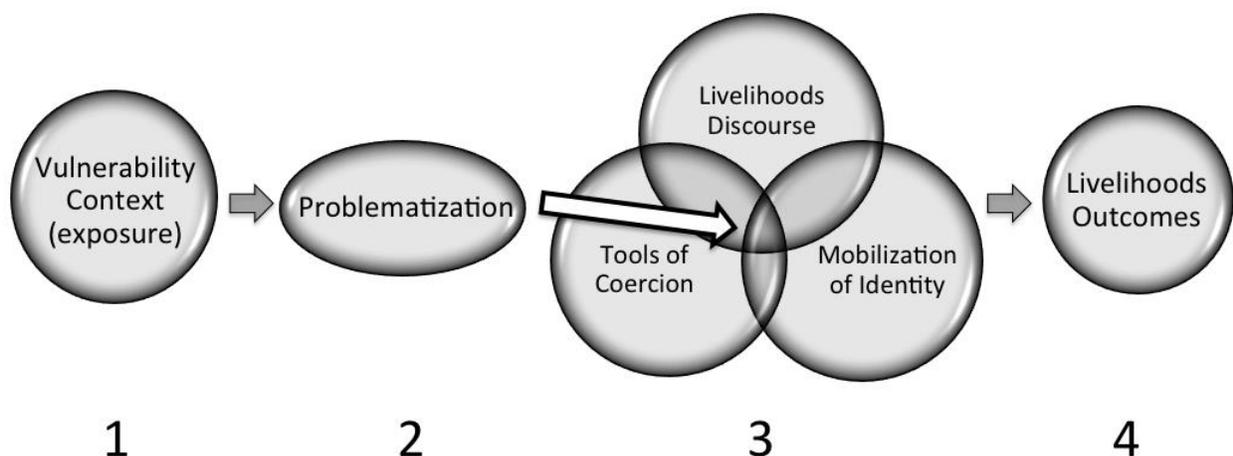


FIGURE 1: Conceptual diagram of the LAG approach (Carr 2013).

To summarize: 1) Identifying current challenges to human well-being and livelihoods outcomes 2) often reveals moments in which the logic and legitimacy of livelihoods strategies are called into question by participants in those livelihoods 3) providing a point of entry to the nexus of livelihoods strategy formation 4) which becomes the basis for interpreting livelihoods outcomes. **Note:** this diagram (and this approach) are meant to explain livelihoods decision-making, and therefore it does not address the obvious feedback loops between observed outcomes and all other steps in the approach.

The execution of the LIG approach involves three separate stages. The first is the collection of data from the field. The second is the organization of that data for analysis, including the translation (where necessary) and coding of field data to facilitate analysis. The third is the analysis of the data. Below, we review each of these stages to give context to the findings presented later in the report.

Data Collection

To obtain field data on livelihoods decision-making, HURDL first worked with the MCCA team to develop a sampling frame for the intervention area. The team agreed that focusing on the livelihoods zone, as defined by the Famine Early Warning System (see Dixon and Holt 2010; Famine Early Warning Systems Network 2015), was the most productive scale of analysis. Previous HURDL experience in Mali assessing livelihoods decision-making and resilience/adaptation interventions (Carr 2014a; Carr, Onzere, et al. 2015) found this scale to be effective as it allowed for the generalization of community-specific findings to a wider area. In both previous work and under MCCA, HURDL worked with local partners to identify villages representative of the livelihoods zone in terms of population composition (ethnicity, age, gender, etc.) and livelihoods (ensuring that activities, and their relative importance, broadly matched the patterns seen as the norm in that zone). The logic of this selection rests on the assumption that if the patterns of decision-making identified in HURDL's detailed analysis emerge from norms and practices that are generalizable to that zone because of the population's shared social, cultural, economic, and environmental context.

MCCAA partner Sahel Eco worked with HURDL staff to identify representative villages in five livelihoods zones in Mopti, and provided 10 experienced field workers to support the HURDL effort. These fieldworkers formed five field teams, each composed of a man and a woman. Each team focused on data collection in a single livelihood zone. These workers were trained in the LIG approach, including in class training to learn the basic concepts behind LIG and its implementation and field training where they practiced obtaining field data via semi-structured interviews under the supervision of HURDL staff. This period was also used to tailor the LIG approach to Mopti and its socio-cultural and linguistic¹ realities. At the conclusion of training, the teams spread out into five villages, one in each zone. HURDL research assistant Tshibangu Kalala oversaw the data collection process, checking in with field teams, helping them organize their data, and working with them on sampling. Because Kalala could only be in one village at a time, he was dependent on the willingness of field teams to contact him via phone if they had questions. Some teams were more willing than others to avail themselves of his help and expertise, and as a result some samples were skewed in terms of gender or seniority (discussed below), creating interpretive challenges during analysis.

Field data collection under LIG has two phases. In the first phase, the field team interviews community members about their vulnerability context and gains a descriptive understanding of their livelihoods (for a detailed discussion of LIG implementation, see Carr 2014a). For three weeks, the field team lived in the village they were studying, interviewing a wide range of residents (typically capturing diversity across gender and age, with some efforts to capture ethnic diversity when appropriate). This effort was aimed at three goals: first, a better understanding who conducts what activities in the community, when they do those things, and to a degree why they conduct those activities. Second, this effort helps the fieldworkers identify contradictions in the data, such as contradictory claims about who conducts an activity, or why that activity is conducted in a particular manner. Such contradictions provide a window onto the different perceptions of activities and vulnerability in the community. Third, these different perceptions of vulnerability, which tend to cluster in terms of what shocks and stressors are named and prioritized, serves to delineate groups within the community around which the population can be re-stratified and further data collection and analysis organized. After this phase of data collection, field teams left their villages and met with Kalala to organize their data and consider the ways in which they felt the community fell into groups. While the goal of establishing these groups was also to provide a check on sampling within each village (to ensure an adequate number of different experiences were covered to allow for robust analysis), not all teams used this data in this manner, resulting in sometimes-thin sampling of particular groups in the final dataset.

Upon their return to the field, the teams proceeded into the second phase of LIG, re-interviewing residents and adding new residents to the sample. This second phase of interviews was more complicated, and aimed at drawing out the three domains that shape livelihoods decision making.

¹ The field training component of LIG is critical in new contexts, not only because it ensure that field teams have basic competency in the approach and the methods required to gather appropriate data for that approach, but also because it provides an opportunity for the field teams to take ownership of the approach and its implementation. For example, while it might be relatively easy to frame a question aimed at understanding the characteristics of a “good” man or woman in English or French, and in an urban setting where even a culturally diverse team might share broad linguistic and cultural assumptions, translating that question into a local language, and into a particular sociocultural context often requires time, effort, and skill that experienced field teams can bring to the approach. In this way, training becomes pilot fieldwork, refining LIG and improving its effectiveness before teams begin to gather real field data.

When asking about *discourses of livelihoods*, the field teams moved beyond enumerating what people do to questions of why individuals participate in those activities, why they undertake them in a particular way, and why other people do or do not participate in those same activities. This line of inquiry naturally engaged the *mobilization of identity*, as asking who does what and why points to not only patterns of participation in activities by identity, but also elucidates why those patterns exist in terms of the degree to which an activity is “appropriate” or “inappropriate” for a given individual and why. Finally, to understand how the patterns of activity and identity that emerge between discourses of livelihoods and the mobilization of identity are maintained over time, the field teams explored the *tools of coercion* that are employed to motivate individuals to conform to the expectations of their identity and livelihoods. These interviews were complex and often open-ended, producing large amounts of detailed ethnographic data on livelihoods decision-making in each village. Interview data were complemented by observational data from the field teams, which was used to triangulate the information gathered through interviews with regard to individual asset ownership and activities, as well as general claims about patterns of activity and identity in the village.

The result of these efforts were 419 total interviews: 88 in Gomou, 91 in Dobolo, 87 in Guile, 86 in Toumadiama, and 67 in Sare Mala. These interviews were recorded on paper, gathered by Kalala from the field teams, scanned, and emailed back to HURDL at Clark University for translation and analysis.

Preparation for Analysis

Interviews were conducted in Bambara, Fulani and other local languages but were handwritten in French by the data collectors. While any translation of interview data creates concerns for data integrity stemming from the potential for lost meaning and incorrect translation, the pilot fieldwork was designed to identify, address, and therefore minimize these issues. Further, the field team check-ins after the first phase of fieldwork allowed for further discussion of these issues by field teams as needed. After the scanned interviews were e-mailed to HURDL the next step was to then have the interviews translated into English to enable the majority-Anglophone HURDL team to code and prepare the data for analysis. Over the life of the project six translators were involved in the translation process. All of these individuals have experience either living in Francophone Africa or working with qualitative data from the Sahel. This was critical for ensuring that the English translations retained most of the nuance, detail and intended meanings in the original interviews. The translation team met regularly to ensure that there was a coherent and uniform understanding of the translation of idiosyncratic words and phrases. An added advantage of translation was that the data was migrated from the scanned PDF forms to Microsoft Word documents, with the latter being easier to organize, explore and code within the analysis software utilized for the study. The translation period also provided the initial opportunity to clean the data.

Once the translation was complete, interviews were imported into MAXQDA qualitative data software in preparation to code the data. The use of a qualitative data analysis software allowed for a logical and coherent management of the large amount of data from the project. It is also useful in allowing the rapid retrieval and analysis of desired information. Seven HURDL staff were involved in coding the data. As Miles and Huberman (2013) note, qualitative projects with

multiple staff members require careful attention to the “social system” of the project. This involved paying attention to how to integrate the various backgrounds and experiences of the seven researchers involved. At the start of the coding process the staff took the time to discuss their backgrounds and experience with qualitative data and working in rural agricultural settings. The sharing of experiences was particularly important in enabling the team members to value the contributions that each member brought to the process. HURDL also spent time understanding the LIG conceptual framework and agreed on procedures to jointly develop a coding structure. Where needed, sufficient time was given for team members to develop fluency in the use of MAXQDA.

Initially, the team developed a codebook based on the LIG framework. The codebook describes what type of information, topics or passages should be included under “parent” codes- broad conceptual codes, which correspond to the LIG framework (Please see attached codebook). Since livelihood activities, discourses, roles and responsibilities vary both within and across livelihood zones. Particular descriptive sub-codes under each of the parent codes are not included in the codebook. Rather, these particular codes were developed through an inter-coder agreement process. After interviews were received from the field and translated, each member of the team coded several interviews and independently developed particular sub-codes. These sub-codes, as well as the codebook itself, were then improved iteratively when HURDL staff met to share and discuss observations and suggestions based on the initial interview coding as well as merge independently developed sub-codes. Following agreement on which codes to include and the phrasing of each of the descriptive codes, a coding structure for the rest of the interviews within that particular livelihood zone was then developed. During the coding process, the coding team also met once a week or bi-weekly, depending on the perceived need, to address any concerns or new developments and ensure the consistency of the coding process.

After the completion of the coding process for a livelihood zone, the data was cleaned for a second time. This included a careful review of the coded segments to remove erroneously coded information, double check that the coding was consistent across all team members, and add any information that might have been omitted during the coding process.

At the end of the coding process the team had created 15,273, 10,387, 9,459, 11,141 and 11,005 data reference points (codes) for Toumadiama, Guile, Gomou, Dobolo and Sare Mala respectively.

Analysis

Once data was translated and coded, HURDL staff analyzed this data to uncover the specific structures of livelihoods decision-making that give rise to observed patterns of behavior and livelihoods outcomes. The analytic process followed a number of steps in each village.

1. Establish the vulnerability context

Using the codes in MAXQDA, HURDL extracted the shocks and stressors reported by the interviewees, and searched for groups within each set of interviewees that shared assemblages of vulnerability that reflected very similar sets of stressors, reported at the same or similar rates. In

this process, codes are often consolidated or decomposed so they more accurately reflect the intent of the interviewees. For example, during this report it became clear to HURDL that the initial code “lack of/insufficient access to farming equipment” needed to be decomposed. A farmer reporting “insufficient access to farming equipment” was talking about something very different than farmers talking about “lack of access to farming equipment.” Those reporting the former stressor were generally wealthy, or at least secure, farmers who wanted to expand their production but could not due to some constraint. The latter were those who could not access such equipment directly, and therefore had to wait until others had used their equipment before borrowing or renting it. This latter situation represents a significant hardship to those dependent on rain-fed agriculture, as delays in planting can cost a farmer significant yields even in a good year.

Once codes were appropriately edited to capture the intent of the interviewees, they were used to extract final reported rates of exposure to different stressors. This formed the basis for grouping the respondents by similar assemblages of stressors. These groups were compared with the groups established by the field teams. Generally, the field teams tended to over-specify their groups in that they would often separate two groups (based on some reasonable characteristic they observed in the field) that, when subjected to in-lab analysis, reported highly similar assemblages of vulnerability. By triangulating the field teams’ notes and the reported patterns of shock and stressor, HURDL was able to establish different groups in each village by assemblage of vulnerability. As the theory underlying LIG presumes that vulnerabilities are closely linked to livelihoods, and livelihoods are efforts to govern the social and material context, each group represents a sub-unit of analysis that likely reflect distinct decisions and decision-making.

2. Deepen context-specific understandings of identity

HURDL draws heavily on the academic and grey literatures to establish both the broad vulnerability context for the places in which it works and to develop a basic understanding of the social and cultural context of the residents of those places. However, this literature is uneven, often dated, and rarely targeted at the specific information needed to understand the connection between identity and livelihoods needed to complete a LIG analysis. Using codes that identified different identities and their associated roles and responsibilities, HURDL triangulated interview data with the literature to identify the specific identities associated with different livelihoods activities, the general characteristics of those identities (i.e. “what are the expectations associated with a senior man versus a junior man”), and the roles and responsibilities that proceed from that identity – both in terms of livelihoods activities, but also in terms of responsibilities to the wider community and society to which they belong. This effort clarified the ways in which we had to disaggregate the vulnerability groups identified in the establishment of the vulnerability context.

3. Explore discourses of livelihoods

In this step, HURDL explored framings of who should be doing what activities, how they should be doing them, and why they should be done in that manner. This serves to identify both sub-group vulnerabilities that might be invisible at the aggregated group level. It also helps identify situations where members of different groups have the same/very similar assemblages of vulnerability. Where there are differences within groups, we can explore their sources of those

differences in identity, roles and responsibility. Where there are differences among those with the same identity across groups, we can look for causes that filter through identity, roles, and responsibilities in different ways. Through the exploration of who does what, how, and why, we establish the “social facts,” framings of the world that are seen by members of this community as valid and true, and which set the general boundaries for possible actions and thoughts (Gidwani 2001, p.79) at play in each community – and in each zone – that produce these relationships in a regular manner. Thus, this investigation explains how the identities explored in #2 (Deepen context-specific understandings of identity) above are enacted *and reinforced* as members of the community perform expected roles and meet expected responsibilities.

4. Identify tools of coercion

While social facts go a long way toward explaining the regular patterns of livelihoods activity in a given community and livelihoods zone, all livelihoods strategies produce unequal benefits. For example, a strategy that organizes all agricultural decision-making under a single, highly-experienced senior man, might serve to produce needed amounts of food on a regular basis. However, that same strategy limits the autonomy of women and junior men, who might bring new ideas to the livelihoods strategy that, for example, better suit changing economic or environmental conditions. Further, the senior man in charge of agricultural decision-making might feel threatened by the introduction of new ideas or practices with which he is unfamiliar, as they might undermine his identity as a reliable, knowledgeable decision-maker, thus leading him to reject these new ideas even if they might actually work *better* than existing practices (an issue that has been described in Carr 2008; Carr 2011; Carr 2013, drawing on the study of livelihoods strategies in coastal Ghana). Such rejection, in turn, further marginalizes other members of the household or social unit under the authority of this senior man, and can produce significant intra-group tension.

In situations like this, social facts are not enough to ensure that members of the household or community play their expected roles. Instead, there must be means by which those who transgress these expectations are compelled to comply. Such tools are often context-specific. For example, in coastal Ghana, land tenure rules become powerful tools of coercion, for members of extended families can police the behavior of their members by denying them access to needed farmland (Carr 2008; Carr 2011; Carr 2013). In Mopti, this study found very regular patterns in the tools of coercion employed to enforce expectations, generally taking the form of an escalating set of sanctions that begins with verbal efforts to “correct” the offender, and escalates through physical violence, social ostracization, and even expulsion from the household, family, or community. However, it is important to note that much of the discussion of tools of coercion in each zone remains speculative, even for those in the community. Many respondents noted that these tools had never been employed because nobody transgressed their roles and responsibilities. This is very similar to findings from southern Mali (Carr, Onzere, et al. 2015), and suggests that the social facts linking identity to livelihoods are very powerful framings of the world.

Unlike previous LIG-based work on livelihoods in Mali (Carr, Onzere, et al. 2015), this study did not uncover an important group of people: those who transgress expectations but avoid sanction. In southern Mali, HURDL found evidence of a few women who were moving beyond

their prescribed roles to take wider control of their livelihoods, engaging in activities that were normally reserved for men, without attracting sanctions. We believe that these women, who have found locally-specific means of moving beyond the social facts of life in their communities, are critical to understanding how social change happens, and therefore how livelihoods (as means of governing the material and social world) evolve. While we did not find evidence of such women in the current study, HURDL feels this is an issue of sampling such individuals are relatively rare and for obvious reasons do not advertise their “subversive” actions. We hope that in the process of implementation and behavioral baseline follow-up, we will identify such individuals and explore how they are able to move beyond existing social norms productively, as such exploration may provide important information about how to best design and introduce interventions that will affect the conduct and character of livelihoods.

5. Check analysis against reported sub-group vulnerabilities

The final step of LIG analysis is to take the understanding of the connected identities-livelihoods-tools of coercion for each group, and for the members of each group with different roles and responsibilities, and apply it to the explanation of the intra-group assemblages of vulnerability reported by members of the community in the first step of analysis. This discussion both identifies the sources of the reported vulnerabilities in each group, explaining the underlying factors that shape observed patterns of vulnerability in a manner that allows for both the programming of appropriate interventions at the start of the project, and the meaningful measurement in changes in vulnerability relative to those interventions across the project cycle. By establishing the underlying initial conditions that produce observed patterns of vulnerability in the present, we can later return to assess 1) changes in observed vulnerability after an intervention, 2) the conditions that produced those changes and whether they represent real changes in the livelihoods strategies of the population (or parts of the population) in question, or if they are just different manifestations of the same strategies, and 3) the likely long-term impact of the intervention on different members of the community that vulnerability have to be addressed in each community.

6. Dataset

The dataset discussed below includes 421 total interviews, 88 in Gomou, 91 in Dobo, 86 in Toumadiama, 87 in Guile, and 69 in Sare Mala. This data is not analyzed in aggregate, as the differences in livelihoods zones are significant enough that aggregation of the entire dataset would obscure more about livelihoods than it could reveal.

HURDL’s analysis is not statistical for a number of reasons. First, the LIG approach does not derive rigor and validity through statistical analysis of a random sample of the population, but instead through a triangulation of different data sources that inform the situations of different, purposively sampled individuals in the community. Such data generally rests on achieving “saturation”, a point where interviews with a particular representative of a group within a population of interest yield no new questions or answers. Further, even if we had sampled the population randomly, our sample sizes are too small to hold up to statistical analysis. While a minimum sample size of 69 might appear robust, the approach employed for this analysis required the disaggregation of each village dataset by vulnerability groups (established in #1

above, usually three in each village). Each vulnerability group was further disaggregated by social factors shaping the roles and responsibilities of the individual. Therefore, the samples for some populations became very small. For example, if a sample of 69 interviews was evenly distributed across three vulnerability groups, each group has an $n=23$. If each group is then disaggregated by gender and seniority (four sub-groups), the average $n = 5.6$. While it is possible to conduct non-parametric statistical analyses of samples this small, the results will not be more meaningful or informative than the qualitative interpretations derived through triangulation.

While LIG employs purposive sampling that ideally captures a large number of each vulnerability group, it is often hard for field teams to identify those groups accurately in the field. In each village, the field team paused after working on the vulnerability context to attempt to group their sample into vulnerability groups. Ideally, the teams were to use these groups to guide their sampling for the next phase of interviews, leading them to interview similar numbers of individuals in each group, and a range of different identities in each group. However, in all cases the field teams over-disaggregated the population (usually into four groups, sometimes more) and as a result, when groups were reorganized during analysis they rarely shaped up with similar numbers. Because group composition tended to be skewed between data collection and analysis, the number of men, women, junior, and senior individuals in each group often varied. Further, the livelihoods calendar presented challenges to interviewing women, especially junior women. At the time the fieldwork was undertaken, the labor of junior men and women was in heavy demand as the agricultural season was underway. For example, in ML06 junior men and women were heavily engaged in rice cultivation and harvesting. Interviews with junior women were more difficult to arrange than with junior men because junior men could be interviewed in the evening, after their return from the fields. However, at this time junior women were often still engaged with domestic tasks and therefore not available. The same problem arose in ML05, but in this case women were very busy with their onion gardens, and when they returned for the evening they were also busy with domestic tasks. In general, during the agricultural season the labor of junior men and women is in heavy demand, and when coupled with women's domestic responsibilities (especially the heavy responsibilities of junior women) it can be very difficult to identify and interview them in numbers equivalent to other groups. While women, especially junior women, were somewhat under sampled as a result of the timing of fieldwork, this does not mean that we cannot say anything meaningful about the women in each livelihoods zone, as the triangulation of these interviews with observation, the literature, and statements from other members of their communities allows for the construction of a rigorous overall understanding of their decision-making. However, as with all sampling efforts, it is important to register this caveat to our ability to generalize to an entire population. The only exception to this is among the Bozo fishermen in Sare Mala of Zone ML 06. Here, the very small sample ($n=9$) resulted in tiny sub-groups that did not serve the purpose of intra-group or cross-group comparison. For that population, we conducted our analysis on the whole without disaggregating.

Behavioral Baselines

This section summarizes the findings of LIG analysis in each of the five villages targeted by MCCA. These five villages represent four livelihoods zones in Mopti.

1. Toumadiama: ML09: West and Central Rainfed Millet/ Sorghum

Zone ML09 is a lateral band running across the northern extent of the Sudanean zone in Mali. Average annual precipitation in this zone is between 600-800mm, an amount that is small enough to challenge the production of most rainfed crops. This limited precipitation is the second-most commonly referenced stressor by the residents of Toumadiama, after access to farming inputs. Overall, the most common stressors in Toumadiama were those related to agricultural production, including the quality of soils, access to draught animals, and access to farming equipment.

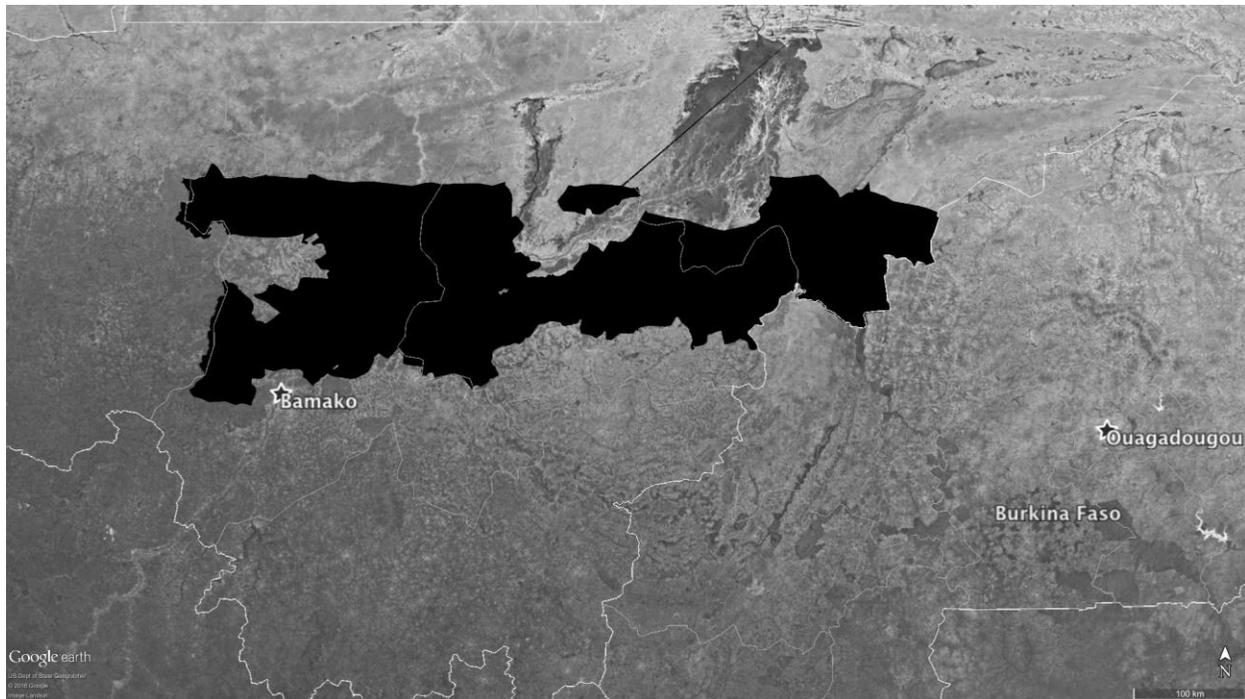


FIGURE 2: Locator map of Zone ML 09

This is a zone heavily populated by Bambara-speaking agriculturalists. Residents are generally organized into concessions, sets of households with related male heads, all under the leadership of a senior man (usually the oldest in the concession). Agricultural production reflects this organization, with each concession having communal fields, and then each household having fields worked under the authority of the head of household. At the concession level, agricultural decision-making is very top-down, with household heads generally deferring to the head of concession even for decisions on their own fields. Within households, women generally defer to men in rainfed agricultural decision-making, though they maintain decision-making on their hand-irrigated garden plots. Animal ownership is common, but very unevenly distributed. Of those interviewed in Toumadiama, roughly 60% lived in wealthier concessions/households with access to oxen, cattle, and even horses that can serve as stores of wealth and animal traction on their fields. They also owned smaller animals like goats and sheep which are used to meet household needs that arise in the course of the year. These concessions/households also owned plows and any other needed agricultural equipment. The average member of this group reported cultivating 6.0 crops each year. Almost every member of this group participated in the cultivation of groundnuts, millet, sorghum, and rice. More than half were engaged in cultivating

black-eyed peas. Nearly 70% of the group participated in irrigated gardening, with the vast majority of this effort going to the cultivation of okra. This group reported an average of 1.7 garden crops, with 57% reporting okra cultivation and the remainder distributing their garden composition across 17 other crops. Overall, the average member of this group participated in 4.2 livelihoods activities over the course of the year, of which 1.6 were nonfarm activities. Almost half of this group reported engagement with trade as a livelihood, and thirty-five percent reported receiving remittances from outside the village. Members of this group participate in a range of non-farm employment (NFE) activities that serve to bring in needed income and diversify their livelihoods. Those living in these concessions/households were deemed to have high asset diversified livelihoods (HADL).

Another 23% of those interviewed lived in concessions without access to oxen, but had some access to cows and horses. This means they have access to traction, but often less efficient and desirable traction. These concessions/households owned small animals, but at lower rates than under HADL. This limits their ability to meet livelihoods needs, such as the purchase of agricultural inputs at the start of the season. They usually lacked direct access to plows and other equipment, or owned some equipment but not enough to facilitate the work of all members of the concession or household. Members of this group cultivated an average of 5.6 rainfed crops, with nearly every member of this group reporting the cultivation of groundnuts and millet, and 85% reporting the cultivation of sorghum and rice. Approximately 55% of those in these concessions/households reported participation in gardening, cultivating an average of 1.5 crops in their gardens. Okra predominated in these gardens as well, with a little under 50% of the group reporting its cultivation. The rest of this production was spread across 10 other crops. Overall, those living in these concessions and households reported participation in 3.7 activities per year, of which 1.2 were nonfarm activities. 35% of this group reported receiving remittances, and 20% reported participation in trade. Individuals living in these circumstances were defined as having adequate asset livelihoods (AAL) in that they had access to assets adequate to meet most of their basic needs, but which did not facilitate reliable surplus production that could facilitate asset accumulation.

Finally, 17% of those interviewed lived in concessions/households with very limited access to animal traction, and often with no direct access to this critical asset. They did not have access to needed agricultural equipment, and therefore were preparing fields by hand or borrowing/renting draught animals and plows from neighbors. Less than half of this group reported access to *any* animal assets, leaving few resources with which to address shocks and stresses that might arise, and indeed few resources with which to purchase basic needs such as food during the hungry season. This group cultivated an average of 4.6 rainfed crops. Nearly all members of this group cultivated groundnuts and millet, but notably less than half of this group reported rice production. A large percentage of this group gardened, reporting an average of 1.1 garden crops. Nearly all of that cultivation was okra, with minor cultivation of watermelon and hibiscus. Individuals in these concessions and households reported an average of 2.9 livelihoods activities a year, of which only 0.5 were NFE. Less than 20% of this group reported participation in trade, and 7% reported receiving remittances. These individuals were defined as having low asset livelihoods (LAL).

This breakdown of the sample largely conforms to the wider breakdown of livelihoods observed by Dixon and Holt (2010), though in that report the residents of the zone were broken down into four groups, as Dixon and Holt disaggregated those with HADL into the extremely well-to-do and the very well-to-do. We did not see such a breakdown in our data, but generally find that our groups reflect those seen in their livelihoods zoning activity. In short, the livelihoods of Toumadiama appear representative of the larger zone to which the village belongs.

Group	Long Name	Animal Ownership	Agricultural Equipment	Nonfarm employment
HADL	High Asset Diversified Livelihoods	Draught animals and smaller animals	Owens plows and other equipment	Diverse range of activities
AAL	Adequate Asset Livelihoods	Lower value animal traction, small animals	Some equipment, but not enough	Some nonfarm activities
LAL	Low Asset Livelihoods	No draught animals	No plow ownership	Little to no nonfarm activity

TABLE 1: Summary of vulnerability groups and their characteristics in Toumadiama

The patterns described above are not purely driven by access to assets. Instead, they are the product of broadly-held understandings of different identities in this village, and the ways in which those identities are translated into specific roles in the context of different levels of asset access. Within this zone, especially among the Bambara, **a man is in part defined as someone who feeds his family**, ideally for the entire year. Ideally, men are expected to do this through agricultural production, not the purchase of food (which is generally interpreted as what a failed farmer must do). Animal husbandry is a secondary activity for Bambara men, engaged to obtain animal traction for their fields or as a source of capital from which to draw when it is time to invest in farming or to address household emergencies. Gardening is acceptable to Bambara men because they use garden production for subsistence, and when they sell this production they tend to invest it in assets that will promote the production of rainfed staple grains. NFE is used as a means of feeding the household or concession during the hungry season, though such a use of this income is tantamount to an admission of failure to cultivate adequate food to feed the family, and therefore a failure to live up to the central responsibility of a man. However, when NFE and seasonal migration are used to generate capital for investment in rainfed agriculture, they become more acceptable activities. This serves to explain why those in LAH/ML have the lowest rates of engagement with NFE: they are working to try to earn their food and income from rainfed agriculture, rather than admitting they cannot do so and thereby calling their identity into question.

Men's vulnerabilities emerge at the intersection of these roles and livelihoods, with their access to livelihoods assets through which to enact those roles. For men in HADL:

- 1) Men speak most often of insufficient access to agricultural assets because they already have stable agricultural production and incomes, and are attempting to secure their status as providers for the household and concession.
- 2) This is particular true of senior men, who express little concern for poor yields or food shortage. Instead, these men are concerned about the maintenance of their assets, and therefore the availability of fodder and medicine for their animals.
- 3) Junior men are more concerned with yields and food shortage, which speaks to the different identities among men that produce different roles and responsibilities. While concession farms are sown early enough and command enough attention and resource to ensure that they produce adequate food, the household farms that these junior men control and for which they get credit are cultivated later and with less attention, therefore making low yields a challenge to their identities as providers. These men are also much more concerned with illness than senior men, because they cannot command a wide group's labor on their own farms, so if they become ill their cultivation will be directly affected.

In AAL:

- 1) Senior men (there was only one junior man in this group) are generally challenged to cultivate enough staple grain to meet their responsibility to provide for the household and concession.
- 2) They worry about rainfall, access to agricultural inputs, soil quality, and insufficient farming equipment. 38% of these men (10 times the number in HADL) reported concerns for food security, and the same percentage expressed concerns for poor yield (double the rate reported in HADL), clearly suggesting these men are unable to cultivate enough rainfed crop to generate the food and income needed for their families. This adds a material dimension to the social stress reflected in the assemblages of vulnerability for men under HADL, explaining the higher rate of concern for food security in this group

In LAL:

- 1) Senior men express concerns very similar to those expressed by senior men in AAL, and for the same reasons. These men are not raising enough staple grain through rainfed production to meet their family's needs for the year. While their efforts to sell groundnuts and their limited animal assets may provide a degree of cushion for this shortfall, it is telling that these men do not engage in NFE at all. Using NFE to bridge the hungry season is a clear statement of the inadequacy of these men's agricultural production, and their failure to live up to expectations, calling their identity and status into question. Therefore, this absence is likely a choice guided by concerns for status as much as a problem of access to assets.
- 2) Junior men report similar concerns, but complain about a lack of NFE opportunity. They are seeking means by which to build their assets, and therefore their future agricultural capabilities.

This leads to four critical points about men's decision-making that have to be considered when addressing these challenges:

- 1) As a result of the expectations attached their identities, men are unlikely to abandon rainfed agriculture as a livelihoods activity, even when they cannot meet their needs of their households and concessions through rainfed staple grain production, as farming is central to their identity.
- 2) Men's subsistence staple grain production is privileged over all other forms of rainfed cultivation, or any other livelihoods activity. To engage heavily in NFE and use that income to purchase food is tantamount to admitting that one cannot live up to this basic expectation of a Bambara man, which calls both authority and identity into question. While successful farmers can participate in NFE because it does not present a challenge to their identity as providers, it is telling that among the more stressed men only junior men, who have to build assets to support their families and improve their status, and who have the lowest access to these assets and therefore the least to lose, are looking for NFE opportunities.
- 3) When men have difficulty meeting household needs, the social imperative to feed the family leads them to pull women out of rainfed production, which can actually enhance food insecurity in times of stress.
- 4) Cash crop farming, in the form of groundnuts, is critical to livelihoods in this zone, but does not trump the social imperative for subsistence production. If a crisis hit that prevented the simultaneous cultivation of groundnuts and other subsistence grains, these farmers would likely scale back groundnut production before scaling back subsistence grains.

In this zone, a woman is one who obeys and supports her husband in his efforts to feed and care for the family. Thus, these women privilege working on concession fields controlled by the head of the concession, and household fields controlled by their husbands (who often defer to the head of concession for decisions on their own farms) over their own efforts to cultivate rainfed crops. They do not contest this role for a variety of reasons, including significant sanctions (including violence) directed at women who are not obedient and supportive, but also because to do so would be to undermine their husbands' identities and status. In low-asset groups that status and identity is quite precarious, and any further loss of status could make it difficult for them to borrow or rent the animals and plows they need from wealthier parts of the community. Such an outcome would negatively impact the woman as much as her husband. For senior women, her identity as a support to her husband is manifest in a role as the individual responsible for family unity, the educator and leader of the junior women of the concession, and the provider of supportive advice to her husband and the other men of the concession. Her role is not to question senior men or to disobey them, for this would result in a significant loss of status for these men which could undermine their identity as decision-makers and leaders.

It is clear that in this zone, gardening is an activity most associated with women. Even in the most stressed of concessions, all or nearly all women reported gardening. This agricultural activity is acceptable for women for two reasons. First, they sell nearly all of it. Therefore, this production does not challenge men's roles as providers of subsistence food and support to their families, as it is not intended to compete with men's subsistence production. Second, the income from gardening, while largely controlled by the women who cultivate the crops, filters back to support the household in the form of purchases of domestic needs like cooking utensils and pots,

and in the form of food purchases for the family. This is also true of the sales of any animals owned by women. By keeping these contributions to the reproduction of the concession and household focused on the domestic sphere, they remain within women's roles, and therefore unthreatening to men. However, should women move directly into the production of staple grains for subsistence, should these garden crops be redefined as subsistence crops, or should women's animal husbandry become a main or critical source of subsistence for the household, these activities would become threatening to men's roles and likely be curtailed, even if cutting off garden production would reduce incomes and access to food.

Women's vulnerabilities emerge at the intersection of these roles and responsibilities, in the context of their access to livelihoods assets through which to enact those roles. For women in HADL:

- 1) Their overall concerns center on the marginal status of their rainfed production, as they lack adequate access to inputs, cannot afford inputs, lack adequate access to farming equipment, and worry about food shortages (though they make no reference to poor yields). These are women who wish to cultivate more than they do, and in so doing earn more income that they can invest in their domestic needs and livelihoods.
- 2) Their concerns for the function of the mill speaks to their particular responsibility for milling the household's and concession's grains.
- 3) Concerns for trade competitors, demand for products, and lack of opportunities to make money reflects the fact that these are among the few activities, along with gardening, that result in income that women control for themselves and their domestic activities. Therefore, this stressor is not as much a threat to their well-being as a constraint on their opportunities in already resource-secure households and concessions.

For women in AAL:

- 1) Their concerns for deadbeat clients, market demand, lack of money, and the cost of kitchen supplies all speak to their more limited engagement with livelihoods activities that produce income they control for domestic and personal purposes. This limits their autonomy in the household, as well as their ability to contribute to the maintenance of the household's domestic sphere.
- 2) Their concerns for rainfed agriculture likely reflect a combination of concerns: first, for the production of their households and concessions, to which they give a great deal of labor and from which they receive their food. Second, this reflects a concern for their own ability to cultivate groundnuts, which yields income they control.

This suggests five important points about women's decision-making that have to be considered when addressing these challenges:

- 1) Women in ML09 are unlikely to take up greater levels of personal rainfed agriculture, as this would both draw their labor away from household and concession farms, and challenge the role of men in their households and concessions. Both would likely trigger significant sanctions.

- 2) Under stress, women will likely see their participation in rainfed agriculture curtailed as men seek to live up to their roles and minimize the threat women's labor might present to that role.
- 3) Interventions that support women's gardening and animal ownership will align with the expectations of women in their roles, but only if the proceeds of this activity are funneled back into the domestic needs and spaces of the household or concession. Incomes large enough to result in asset accumulation or investment in spaces and activities beyond the domestic sphere are likely to be appropriated by their husbands or the heads of concession under which they live, as that income is pushing them outside their proscribed roles.
- 4) Women's livelihoods activities are non-threatening to men if the proceeds of these activities are returned to the household in the form of investment in the domestic sphere. This is why women have such a high rate of participation in gardening and trade in this zone. While they control the proceeds from their gardens and from their trading activities, they tend to spend the bulk of this income on domestic needs, aligning this activity and its outcomes with their responsibilities to the household. Expanding women's livelihoods activities will require finding similar ways of making the income align with women's roles.
- 5) Women's animal ownership is similarly constrained by the expectations attached to their identities. When living in high-asset situations where men are secure in their ability to live up to their responsibilities, women's ownership of animals is not a threat to their status. As a result, women own not only small animals like poultry, but even sheep and cattle. As the asset situation of the household or concession deteriorates, however, men become less secure in their role and identity, and women's ownership of animals becomes more constrained. Women are less and less likely to report oxen, cow, or horse ownership as the asset situation of the household deteriorates because draught animals support men's unreliable and inadequate staple grain production, and because the ownership of such assets might place women in a position of providing for the household or concession should the man's agricultural activities fail or produce a significantly inadequate harvest.
- 6) Interventions that push greater women's engagement with staple crop production will deeply threaten men's identities in this village and zone and are not likely to gain traction.

2. Gomou: ML13, Center-Eastern Millet and Livestock

Zone ML13 is a band running to the south and east of the Dogon plateau. As in ML09, this zone receives between 600-800mm of rain each year. Insufficient rainfall and insufficient access to water were the third and fourth most commonly-referenced stressors in Gomou. At least as important were stressors on grazing land, including both inadequate grazing land and competition between agricultural and pastoral livelihoods. Concerns with access to fertilizer and other inputs that might improve soil fertility were less common, reflecting the emphasis on animal husbandry in the livelihoods of those in this zone.

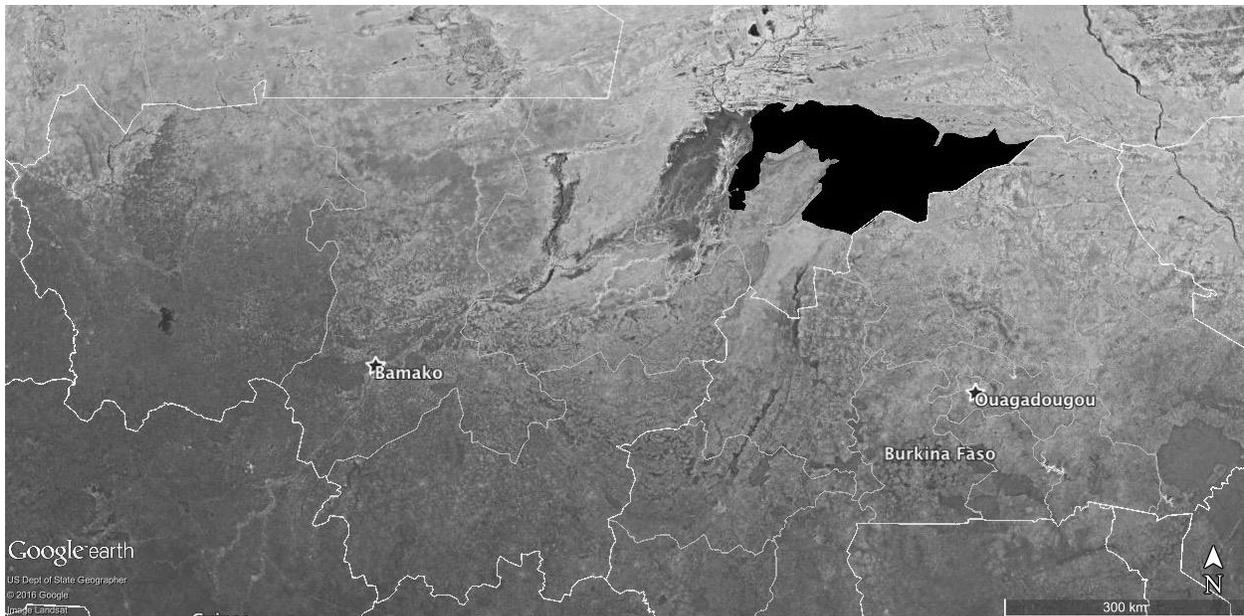


FIGURE 3: Locator map of Zone ML 13

Gomou, which represents this zone, is populated by Dogon agriculturalists. The residents of Gomou, and zone ML13 more broadly, organize themselves into households under *tire ginna*, or minor lineages. Minor lineages function in a manner analogous to concessions among Bambara-speaking agriculturalists in Zone ML09. As in Bambara concessions, members of Dogon communities obtain usufruct rights to agricultural land through their minor lineages, which are controlled by the head of lineage, usually the oldest man in the lineage. Where once this was a very rigid hierarchy, the importance of the minor lineage in Dogon life appears to be changing, with junior men starting their own independent households before the death of their father. Gomou reflects this trend, as HURDL found both minor lineages and independent households, and therefore noted both as units of agricultural production.

The field team in Gomou suggested that the assemblages of vulnerability reported in the community might be best divided between those in households or extended families that owned draught animals, plows, or other heavy agricultural equipment, and those who did not. Sixty three percent of the sample from Gomou reported ownership of or access to (via husbands, fathers, or children willing to plow their fields) draught animals and plows – we refer to these as High Asset Households/Minor Lineages (HAH/ML). Nearly all members of this group participate in rainfed agriculture, cultivating an average of 4.5 rainfed crops. The most commonly-cultivated crops were groundnuts (which were cultivated more frequently by women than men, though men participate in this cultivation heavily), millet, kenaf, and fonio (cultivated more frequently by men than women). Fonio is a crop of ritual importance to the Dogon, and heads of minor lineages cannot eat it (Van Beek 1991). Also of interest is the characterization of groundnuts as a women’s crop by Van Beek (1991), as in contemporary Gomou it is not clearly gendered. Forty-seven percent of the group participated in garden crop production, and those that did cultivated an average of 1.3 crops. Earth peas (35% of the sample) and okra (21% of the sample) were the most commonly-cultivated garden crops in this group, with both squash and potatoes cultivated by less than 4% of the sample. Members of this group owned an average of 2.6 different kinds of animals, with 90% reporting sheep ownership, nearly 62% reported owning

poultry, and roughly half of the group reporting the ownership of goats and/or oxen. Members of this group have very limited access to NFE, reporting only 0.6 nonfarm activities per person. This included very limited engagement with artisan work and migration for work.

Those who did not own animal traction or plows, and who lacked direct access to them via their households or minor lineages, belong to Low Asset Households/Minor Lineages (LAH/ML). These LAH/ML have to either borrow or rent this animal equipment from those in HAH/ML, an option only after HAH/ML have employed these resources on their own farms. Every member of this group participated in rainfed agriculture, cultivating an average of 4.9 crops each. Over 90% of this group cultivated groundnuts (cultivated slightly more frequently by women than men) and kenaf (cultivated more frequently by men than women), and 85% cultivated millet (also cultivated more frequently by men than women). Thirty-five percent of the group reported cultivating garden crops, with those involved in gardening cultivating an average of 1.2 crops. The only garden crops reported by this group were okra (cultivated by 27% of the sample) and earth peas (cultivated by 15% of the sample). Those in LAH/ML owned an average of 1.7 different types of animal. Eighty-one percent of the group reported participating in the husbandry of sheep, and 62% reported the husbandry of poultry. Only 15.4% mentioned owning donkeys, which surpassed the 11% who reported owning goats. Only 3.8% of the group reported owning oxen. As with HAH/ML, those in LAH/ML had very low access to NFE, reporting an average of 0.7 NFE activities. This includes 27% of the group reporting participation in trade, and 23% participating in artisan work.

Group	Long Name	Animal Ownership	Agricultural Equipment	Nonfarm employment
HAH/ML	High Asset Households/Minor Lineages	Draught animals and smaller animals	Owns plows and other equipment	Very little NFE
LAH/ML	Low Asset Households/Minor Lineages	No animal traction, small animals	No ownership of plows and other heavy equipment	Very little NFE

TABLE 2: Summary of vulnerability groups and their characteristics in Gomou

Zone ML13 is a new zone defined in 2015, and FEWS-NET's (2015) description of the zone is much less detailed than the work of Dixon and Holt (2010) in other zones. In the new characterization of this area, FEWS-NET calls this zone one of significant production deficits that cover less than six months of needed food each year. However, in the previous classification of the area, FEWS-NET noted that the area around Koro (which includes Gomou) was a surplus producing area. This seems a more accurate characterization of this area, as in Gomou only 22% of the population reported concerns for low yields, and 11% reported food shortage as a stressor. Second, the heavy focus on groundnut cultivation in Gomou is a significant deviation from FEWS-NET's description of this zone, which did not mention groundnuts at all. Groundnut cultivation for market sale is common among the Dogon (Groote, Douro-Kpindou, and Togo 1997), but not to the extent seen in Gomou. Finally, rates of oxen, cattle, and goat ownership are much lower than expected given FEWS-NET's description, but in line with the findings of other studies of this part of Mali (Groote, Douro-Kpindou, and Togo 1997) and the older FEWS-NET

characterization of this zone (Dixon and Holt 2010). Because Gomou is located right at the interface between ML09 and ML13, it appears that this community has taken on aspects of livelihoods seen in both zones.

The patterns described above are the product of the roles and responsibilities attached to identities formed at the intersection of gender and seniority, and enacted through the livelihoods resources at hand. In Dogon society, men are the providers for the household and/or minor lineage. This provision can come from rainfed agriculture, the sale of garden crops and/or animals, or even NFE. The critical point is that a man works hard to meet his family's expenses. Senior men are decision-makers within their minor lineages, and are expected to ensure the food security of the household or lineage. This responsibility is principally manifest in their decision-making authority over livelihoods, as opposed to their personal labor in the fields. Junior men are critical to the achievement of food security, however, as it is principally their labor, under the direction of senior men, which results in harvests. To some degree, NFE choices are shaped by identity, as Dogon society has identities that function much like castes for tasks like blacksmithing and leather working. This is a marker of identity, in that those who do this work historically did so in service of wealthier, more powerful individuals in the society, and so this activity marks them as in a somewhat lower social tier (Crane 2006). Blacksmithing in particular has a complex place in Dogon society, as blacksmiths played important ritual roles. While blacksmiths are seen as somewhat separate from the rest of Dogon society, blacksmithing can be a lucrative occupation, and therefore blacksmiths are not necessarily worse-off than other Dogon in the area. In any case, the impacts of identity on NFE selection are not tremendously important to the overall livelihoods activities of individuals in this community, as NFE makes up a small part of the activities they undertake and the income they generate.

For men in HAH/ML:

- 1) Senior men are deeply preoccupied with impact of poor soils on the productivity of their farms, with concerns for poor soils, access to fertilizer, manure, and the cost of fertilizer all predominating in their assemblage of vulnerability. However, it is important to note that these concerns are all with *sufficiency*, suggesting that they have access to these inputs, just not as much access as they desire to meet all their goals.
 - a. The fact these men do not reference food shortage in any significant numbers, and only a few reference poor yields, reinforces this interpretation
 - b. These men are concerned with reinforcing their status, and extending the material assets of their households and minor lineages.
- 2) All men are concerned with adequate access to grazing land. This reflects the fact they own animals that require grazing, and therefore to an extent these stressors are a product of their relative wealth. However, these men note a concern for farmland taking up grazing land, and thus putting pressure on important animal resources. This pressure would be more acutely felt by those owning or with access to animal assets, which explains why senior men in LAH/ML express little concern for this conflict.

For men in LAH/ML:

- 1) As with men in HAH/ML, they are stressed by soil quality, but this is impacting their basic production and meeting their basic responsibility to care for their family. These men complain about a lack of access to fertilizer, and say little about insufficient access to fertilizer and manure, suggesting they are much more dependent on the quality of the soil for their production than their HAH/ML counterparts.
- 2) Men's concern for inadequate rainfall also suggests greater sensitivity to the stresses on their production, and limited means of addressing those stresses through inputs or extensification. This limits the decisions senior men can make that might bring about better agricultural and livelihoods outcomes, calling their decision-making and status into question.
- 3) These men cannot cultivate larger fields because they lack the assets to do so. These men express concerns for a lack of access to draught animals, a fundamentally different concern than that expressed by men in HAH/ML. Without access to these animals the cultivation of fields large enough to both feed a minor lineage and produce a marketable surplus is impossible.
- 4) Men in LAH/ML have little access to NFE, and do not even participate in gardening in a significant manner. Therefore, they are nearly completely reliant on their farms and animal husbandry to meet their responsibilities to the household. While they can meet the needs of the household through NFE without losing status, they do not appear to be doing so.

This suggests five important points about men decision-making in ML13 that have to be considered when addressing these challenges:

- 1) While the cultivation of rainfed staple grains is at the heart of men's livelihoods in Gomou, this is not the only means by which a man can live up to his identity and responsibilities. This is particularly true of blacksmiths and leather workers, who occupy special places in Dogon society. Therefore, men are likely open to a range of livelihoods opportunities that might improve the security of their lives and livelihoods.
- 2) NFE participation is a complex mix of opportunity and identity. Those who identify as noble in Dogon society will not participate in blacksmithing or leather-working, even though these activities can bring in a great deal of money.
- 3) The fact men are cultivating groundnuts in large numbers suggests that the gendering of crops, and of livelihoods more broadly, is shifting or at least responding the particular agroecology of the area in which residents find themselves. This indicates a degree of malleability in the responsibility for the cultivation of cash crops, but does not suggest that men have abandoned, or will likely abandon, the cultivation of staple grains as a principal focus of their rainfed agriculture.
- 4) The shifts in Dogon society that suggest a move away from a rigid patrilineal gerontocracy (though perhaps only the gerontocracy is in question at this time) may be enabling some of this shift into new forms of rainfed production, as junior men appear to be breaking away from the control of senior men earlier in life in an effort to gain greater control over their own livelihoods.
- 5) Animal husbandry is an activity that largely serves to support rainfed agriculture in Gomou, and animal traction remains highly prized. Men routinely talk about selling animals to meet

other household or farming needs. Proceeds from such sales will, under current conditions, be returned to the household in the form of greater investment in rainfed agriculture.

Women in Dogon society maintain the domestic sphere, and support their husbands in an obedient, respectful manner. Indeed, central to a woman's identity in Gomou is respectfulness, not just to one's husband, but to their in-laws, and all members of the community. Dogon women in Gomou generally represented the household or minor lineage as belonging to their husband or to another senior man, presenting themselves less as partners and more as obedient helpers and servants within these units. This identity produces and rests upon particular roles and responsibilities, most centrally maintaining the domestic spaces and activities of the household or minor lineage. For example, women are expected to cook for their families, and to gather the firewood needed to enable such cooking. By and large, women appear to have the right to keep the proceeds of their own gardens and NFE, though this is clearly a site of some tension. One woman brought this to the fore when she explained that she gave her husband a little of this income because "if I do not, he will take a lot." Further, men generally did not acknowledge that women earned their own incomes (though they also did not dispute the idea that such incomes existed – they simply ignored the subject). Senior women are expected to give advice, but principally to junior women within their households and minor lineages. Their advice is not sought out by men, and they appear to have little voice in the livelihoods decisions of the larger household or minor lineage.

Women's vulnerabilities in HAH/ML:

- 1) The focus of both junior and senior women's vulnerability contexts is on ensuring they are able to meet their responsibilities to the domestic activities and spaces of the household and minor lineage, as well as to ensure a degree of income that meets their own personal needs and ensures a degree of autonomy in their everyday lives. They are not, however, expressing concerns about fundamental needs for food and income in their households, minor lineages, or in their own livelihoods. Instead, these are concerns for meeting their responsibilities for the maintenance of the domestic functions of the household and minor lineage, expectations they appear to be able to meet regularly.
- 2) The concern for inadequate access to water speaks not merely to the human, animal, and gardening needs for water, but women's role in fetching that water, especially for domestic purposes or for use in their own livelihoods activities. This also explains the concern for access to health centers, as women care for sick children in their households.
- 3) Women's concerns for the function of mills relates to their role in milling the grain from concession and household farms more than a concern for milling their own grain production.
- 4) Junior women's assemblage of vulnerability is dominated by concerns for their marketing activities, whether their customers can access the money necessary to buy their goods, and whether they are earning enough income from trade. This money grants them autonomy within their households, from both their husbands and any senior women.

For women in LAH/ML:

- 1) Senior women's assemblages of vulnerability are focused heavily on the production of staple grains and groundnuts that are needed to meet the needs of the household and minor lineage.

They frequently report a lack of water, which reflects their need for water and their role in procuring it for domestic needs, and access to health centers, as they often care for sick grandchildren and junior women. Nearly all other concerns are oriented to the outcomes of what are generally seen as men's responsibilities, and might reflect their concerns over their husband's ability to meet his responsibilities and maintain his status in the minor lineage.

- 2) Junior women's concerns are much more focused on the domestic sphere, reflecting their responsibility for maintaining the domestic function of the household and minor lineage. Embedded in these concerns is a concern for their ability to cultivate groundnuts, an important source of income they use to meet domestic and personal needs, and a source of autonomy.

This interpretation of women's vulnerabilities in Gomou/ML13 raises four important points about women's decision-making that have to be considered when addressing these challenges:

- 1) Married women, and unmarried women living with their parents, are unlikely to take on significant rainfed staple crop cultivation outside of peanuts. Their participation in rainfed agriculture outside of groundnuts is primarily limited to work on the farms of their minor lineage or household, farms controlled by their husbands and the head of the lineage. What little rainfed cultivation they control is secondary to that of the fields controlled by men.
- 2) Women's income from peanuts, gardening, NFE, and the husbandry of their own animals belongs to them. However, this does not appear to constitute a threat to men as providers for the household or minor lineage because when women spend this money, they tend to spend it on domestic needs. This appears to have the effect of making this income and spending acceptable, as they serve the larger end of maintaining the domestic space of the household or minor lineage, a key part of women's role and identity. Therefore, efforts to augment women's garden production or groundnut production would not encounter many initial barriers, as women have existing means of making this additional income "acceptable."
- 3) Conversely, interventions in other assets, such as animals, that do not serve the purpose of reproducing the domestic space and function of the household, could be seen as a threat to the social order. Men would likely resist such efforts, and the community would likely sanction women who attempted to accumulate assets and gain a voice outside the domestic sphere. It is worth noting that junior women in LAH/ML did mention concerns for access to draught animals and adequate grazing land frequently, suggesting that in situations where men are not meeting their responsibilities, women seek to acquire assets that men might otherwise monopolize. This, in turn, is likely to create stresses in these households and lineages that further highlight men's failure to live up to their responsibilities, and therefore command the respect of other members of the community.
- 4) Women's incomes exist in a precarious balance between providing needed resources and becoming a threat to the status of husbands and other men. Women may therefore reject new income-generating opportunities if they fear that such opportunities will increase their incomes such that their husbands start to pay attention to and appropriate larger shares of this income.

3. Dobo: ML05: Dogon Plateau – Millet, Shallots, Wild Foods and Tourism

Zone ML05 sits atop the Dogon Plateau, in a zone receiving between 400 and 600 mm of rain each year. This limited rainfall allows for rainfed millet production, but generally is too little to allow for any other rainfed crops, including sorghum. As a result, the zone is generally one of food deficit, but the hungry season is relatively short, running through August and September as residents await the millet harvest. To address these staple grain shortfalls, residents of this zone supplement their rainfed production with considerable market gardening, which is either hand-irrigated or set up alongside rivers, streams, and ponds. This garden produce is further enabled by high levels of market access enjoyed across much of the plateau, which facilitates the sale of these crops. Dobo reflects these conditions nearly perfectly, sitting atop the plateau along a river with multiple dam structures that the residents use to facilitate dense garden plots. Dobo also has good market access, as it is located 10km from Bandiagara, a town of 25,000 residents, and 60km along a good road from Sévaré and Mopti, which have a combined population of over 114,000.

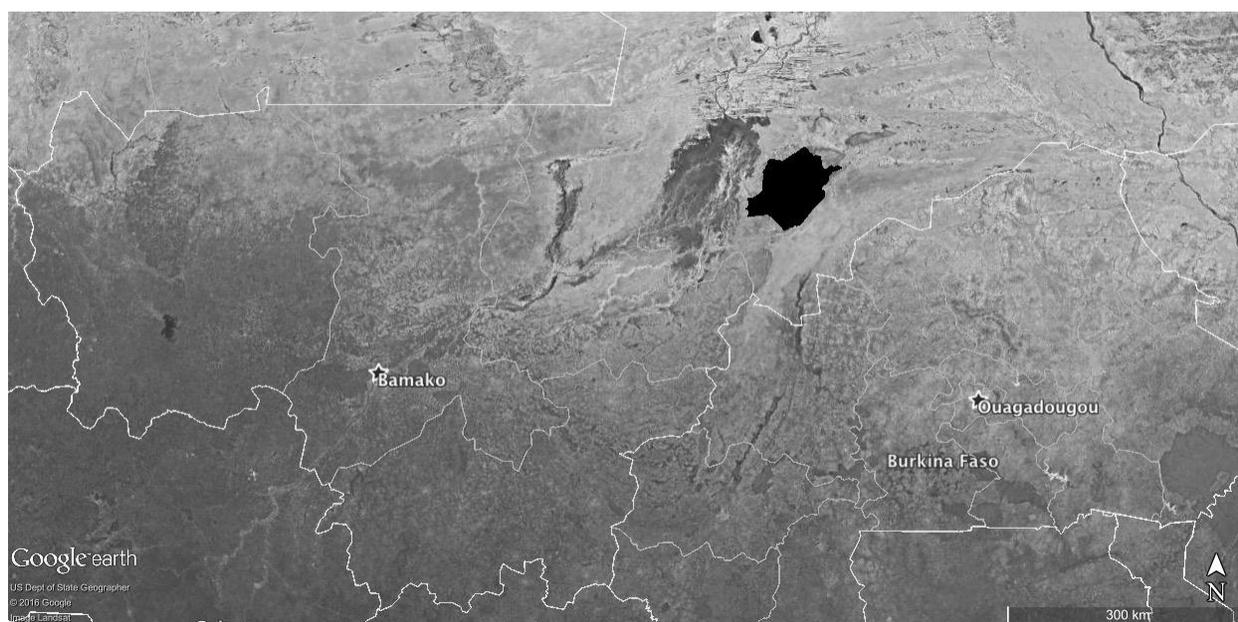


FIGURE 4: Locator map of Zone ML 05

In Dobo, the most-commonly cited stressors were related to gardening – over 90% of the population reported concerns for the lack of water for gardens, and more than 80% reported concerns for insufficient garden crop seed and insufficient fertilizer for gardens. Concerns for rainfed staples are manifest in the 70% of the population concerned with food shortages and poor yields (both linked to the concern for insufficient fertilizer), insufficient rainfall, and insufficient farming equipment, but all of these concerns were expressed by fewer residents than were gardening concerns. Livestock concerns are relatively rare in Dobo, with a little over 40% of the population expressing concern for access to fodder, and just over 20% mentioning concerns for animal disease or death. Notably, most concerns mentioned by residents of this community were for the insufficient access to particular assets or resources. This suggests that most residents of this community do not suffer from an outright lack of access to needed assets and resources, but need greater access to them to achieve their livelihoods goals. This, then, is not a community

reporting on absolute deprivation as much as it is one that is finding challenges moving beyond their current economic and material conditions. These concerns reflect some of those identified by FEWS-NET (Dixon and Holt 2010), such as poorly-timed or late-starting rains and livestock diseases, but the focus on gardening stressors was not captured in the FEWS-NET assessment.

HURDL's analysis disaggregated the population of Dobo into three groups on the basis of their reported assemblages of vulnerability. One group, made up of 36% of the sample, lived in households or minor lineages with access to animal traction, plows, and gardening equipment, situations we called high asset households/minor lineages (HAH/ML). The second group, which included 19% of the sample, lived in situations where they lacked reliable access to oxen or other draft animals, but generally owned farming and gardening equipment (though perhaps not to the degree residents wanted). These situations were called adequate access households/minor lineages (AAH/ML) because they usually were able to meet their basic needs on a yearly basis. The final group, which included 45% of the sample, lacked direct access to animal traction, farming equipment, and gardening equipment. They owned very few animals of any sort. These were called low asset households/minor lineages (LAH/ML). This grouping is different than FEWS-NET's grouping of the population of ML05 into quartiles, but there are many similarities between the groups identified by FEWS-NET and those identified by HURDL in Dobo. HAH/ML generally include those in the top quartile of FEWS-NET's analysis, but pull a few members of the second quartile in as well. AAH/ML are largely the bottom half of the second quartile of FEWS-NET's grouping. LAH/ML are the rest of those described in FEWS-NET's analysis. Broken down in this manner, the ratios of groups divided by asset ownership largely conform to those observed by FEWS-NET in the larger zone, suggesting that livelihoods in Dobo are representative of those seen in ML05 more broadly.

Group	Long Name	Animal Ownership	Agricultural Equipment	Nonfarm employment
HAH/ML	High Asset Households/Minor Lineages	Draught animals and smaller animals	Owens plows and other equipment	Very little NFE, high access to gardening assets
AAH/ML	Adequate Asset Households/Minor Lineages	Very limited or no animal traction, small animals	Owens plows and other equipment	Very little NFE, high access to gardening assets
LAH/ML	Low Asset Households/Minor Lineages	No animal traction, few animals of any kind	No ownership of plows and other heavy equipment	Very little NFE, limited access to gardening assets

TABLE 3: Summary of vulnerability groups and their characteristics in Dobo

The structure of livelihoods decision-making in Dobo largely conforms to the description of this decision-making in Zone ML13 because Dobo, like Gomou in ML13, is a Dogon community. Therefore, the understanding of identities and the attendant structures of authority and decision-making that go along with these roles and responsibilities is largely the same in the

two contexts. However, differences in the two livelihoods zones produce different roles and responsibilities under these identities. For example, in Dobolo men's responsibility to care for their family includes the cultivation of staple grains via rainfed agriculture, but it also means being intensely involved with gardening. Rainfed agriculture on the Dogon plateau offers few pathways to the amount of food necessary to feed a household or minor lineage for the year. This is why nearly all of this production, and all of men's rainfed production, is used for subsistence. A man can only market rainfed production when there is a surplus, and in Dobolo local conditions ensure there is never a surplus – indeed, there is nearly always a deficit. Therefore, for men to meet their responsibility to feed and care for their households and minor lineages, they must grow garden crops for food and for the income that enables food purchases when staple grains run out. This is particularly true for the less well-off in Dobolo, as they generally lack access to animal traction and equipment for rainfed agriculture, creating additional limitations on their production, though even HAH/ML have low rates of draft animal ownership. The relatively low rates of animal ownership outside of HAH/ML create further challenges for men who seek to meet the needs of their households and minor lineages, as they do not have assets they can liquidate to invest in agriculture or gardening, or to purchase food during the hungry season.

The different assemblages of vulnerability reported by the different groups in Dobolo are not merely the product of differential access to livelihoods resources. The identities of the different residents of this village come with roles and responsibilities for livelihoods. Each individual enacts those responsibilities in the context of the resources they have at their disposal, creating different exposures, sensitivities, and adaptive capacities across the community. For men in HAH/ML:

- 1) The assemblages of vulnerability for men in HAH/ML are dominated by concerns over the *sufficiency* of access to critical assets and inputs, such as fertilizer, seeds, farming equipment, and fodder. This means that these men have access to these assets, but not to the extent they desire to achieve all of their goals.
 - a. Critically, rates of animal ownership are generally low in Dobolo, and in ML05 more broadly. Even men in HAH/ML own few animals, but do not report access to these animals as a significant stressor, because they are able to meet household needs for cash income through the profits from gardening (see below).
 - b. The focus on insufficiency, and the lack of reporting on limited animal ownership as a stressor, suggests that the reported concerns for insufficiency are vulnerabilities to men's identity as providers for the household or minor lineage, but not to the material well-being of the household or minor lineage in an average year.
- 2) The concern these men have for poor transportation infrastructure reflects the importance of garden crop income in their livelihoods, as this shapes their ability to move their crops to market. This is a critical vulnerability, for this income offsets their low rates of animal ownership, ensuring that men meet their responsibilities to the household.
- 3) The high rates of concern for access to adequate grazing land and fodder among men in this group reflects not a high rate of animal ownership, but a constraint shaping the number and type of animals men with financial resources can own in this community.

In AAH/ML:

- 1) Men are most preoccupied with stressors that affect their production of rainfed and garden crops. As in HAH/ML, these are generally phrased in terms of insufficiency, but are reported by a larger percentage of men in AAH/ML. Thus, those in AAH/ML, while having a degree of access to needed resources, have limited enough access that they feel squeezed in their efforts to raise adequate food and income to meet their responsibility to care for the family.
 - a. Their slightly greater concern for yields suggests that the degree of insufficiency they are reporting for inputs is greater than that seen in HAH/ML.
- 2) These men share a concern for the quality of transportation infrastructure with their counterparts in HAH/ML, as the income from garden crop sales is a critical resource that bridges the gap between rainfed staple production and the needs of the household and/or minor lineage.
- 3) The lower rates of reported concern for adequate grazing land and fodder suggest this is a group that has fewer resources needed to purchase animals than in HAH/ML, owns fewer animals overall, and therefore much more rarely encounters these limitations on their animal ownership.

In LAH/ML:

- 1) Very high rates of reported concern for poor yields and food shortages among the men in this group suggest that their low rates of animal ownership and access to agricultural equipment result in rainfed staple grain production is inadequate to meet the food and income needs of the household and/or minor lineage.
- 2) While concerns for rainfed production are prominent in the assemblages of vulnerability for men in LAH/ML, the most frequently-cited stressors are those associated with gardening. Concerns for inadequate access to water, fertilizer, seeds, and a transportation infrastructure that might facilitate the sale of these crops also looms large for these men. As in the other groups in in Dobolo, men in LAH/ML see gardening as a critical means of meeting material needs and shoring up their identity as providers. However, these men lack many of the assets they need to use garden production and income in this manner.

This interpretation of men's vulnerabilities in Dobolo/ML05 raises seven important points about men's decision-making that have to be considered when addressing these challenges:

- 1) Men, who have a central responsibility for providing for their household and/or minor lineage, cannot do so through rainfed agriculture. The degree to which they fall short of this goal with their rainfed agricultural production varies depending on their access to agricultural assets, with the most asset poor households and minor lineages falling the most short.
 - a. Those in the most asset-rich households own animal assets that facilitate their rainfed production principally by providing capital for needed inputs (overall, there are relatively few individuals who own draught animals in Dobolo). These animals can also be sold to cover shortfalls in income or food resulting from inadequate rainfed production. This option is less available to those in AAH/ML, as they have fewer and

- less valuable assets to draw down, and almost entirely unavailable to LAH/ML due to their paltry animal ownership.
- b. Men cover the gap between the needs of the household and minor lineage with garden crop cultivation and sales. The poorer the household or minor lineage, the more dependent they are on garden crops to meet their responsibilities, both because of the likely greater shortfall from rainfed production, and because they have fewer animal assets to draw down to meet this need.
 - c. Men report little NFE, even in HAH/ML. They report only minor engagement with trade in AAH/ML, and no NFE at all in LAH/ML. These activities do not significantly diversify men's livelihoods activities, nor do they provide enough income to cover the difference between food and income needs and typical rainfed production.
- 2) Senior men, whose identity as leaders is predicated on the efficacy of their decisions, have a very precarious status as even the best decision-maker is unlikely to lead his household or minor lineage to the levels of rainfed production needed to meet needs for the entire year. For most of these men, the question is the degree of shortfall, not if there will be a shortfall. They control decisions about other livelihoods activities, and the sum of those activities appears to meet the needs of the household and minor lineage more often than not across all vulnerability groups. However, those leading households and minor lineages with adequate or low asset access may find themselves failing to meet expectations frequently enough to undermine their authority and enable the splintering of junior men and their families observed by Groot, et al (Groote, Douro-Kpindou, and Togo 1997).
 - 3) Interventions that augment men's ability to feed their families with staple grains from their farms will serve to bolster these men's efforts to live up to the responsibilities attached to their identity. This includes information targeted to senior men or men heading independent households that might improve their decision-making, as the quality of those decisions is critical to their status and authority.
 - 4) Interventions that augment garden production will impact men at least as much as women, as men use this production to cover gaps in the household and minor lineage food supply. However, it is worth noting that men's participation in gardening in Dobo is substantially higher than seen in Gomou, another Dogon community in a different livelihoods zone. This suggests that in Dobo men have begun to co-opt a women's livelihood activity in an effort to meet their responsibilities to the household and minor lineage, and this co-option might intensify if external resources make gardening more productive or lucrative.

Women in Dobo, like their counterparts in Gomou, are those who care for and support their husband and family. These women are expected to be obedient and respectful of their husbands, in-laws, and those in the minor lineage and community. They are engaged with their husbands in the production of rainfed staple grains, except for rice, which is cultivated much more frequently by men. Women's participation in rainfed production diminishes as the household or minor lineage's access to agricultural assets diminishes. This is a product of men's identity as providers for the household and minor lineage. In asset-secure situations, where men's rainfed production might not be adequate to feed and care for the family for the entire year, but when combined with animal husbandry and gardening they are able to meet these needs, women's participation in an activity so central to a man's role is less threatening. As men have greater difficulty living up to this role (because of their limited access to agricultural assets), women's participation in

rainfed production is less welcome, as their presence can serve as a threat to men's perceived ability to meet their obligations. Women are able to garden and own a very limited number of animals, even in asset-challenged households and minor lineages, because that income is seen as their own and part of women's contribution to their role as keepers of the domestic sphere. This is also true of women's high levels of participation in groundnut cultivation across all groups. Men in more asset-challenged situations have to back away from groundnut production because, as a crop that takes much of its value from market sale, groundnuts can be construed as a distraction from their central role as providers in the household. Because this income is typically spent on domestic needs, such as kitchen equipment, it does not pose a threat to men's role as providers. Were women to start purchasing draught animals or large amounts of the food for the household, this would present a significant threat to men and their roles, and would likely trigger a backlash.

Women's vulnerabilities (in this analysis, focused on senior women, as the field team only interviewed two junior women in Dobolo) emerge at the intersection of these roles and livelihoods, in the context of their access to livelihoods assets through which to enact those roles. For senior women in HAH/ML:

- 1) Women's assemblages of vulnerability center on garden activities over which they have a great deal of control. Rainfed agricultural concerns, such as insufficient fertilizer and insufficient rainfall, reflect their interest in their groundnut crops, as they control the income from the sale of these crops as well. In short, their vulnerability context reflects a concern for extending activities over which they have control, and which provide income through which they can maintain the domestic activities of the household and/or minor lineage.
- 2) Despite the fact that the marketing of their groundnuts and garden production are the only significant ways in which these women can acquire income that they control, they report concerns for the transportation infrastructure at lower rates than men. This speaks to the fact that men do much of the marketing of these crops (even if women produce them). Therefore, men are likely to be somewhat more exposed to and aware of the challenges that a limited transportation infrastructure poses to this marketing.

For women in AAH/ML and LAH/ML:

- 1) Their assemblage of vulnerability greatly resembles that of women in HAH/ML in that their principal preoccupation is with stressors related to garden production and peanut cultivation. They are much more concerned with the quality of transportation infrastructure than those in HAH/ML, suggesting that these women play a greater role marketing these crops, and that in AAH/ML garden crops overall are much more important to the overall economy of the household and minor lineage.
 - a. This subtly suggests that women's garden production and peanut cultivation, which are acceptable because they are aimed at "domestic" needs that fall under the purview of women, are playing an important role in meeting the overall needs of the household and/or minor lineage. This could serve as a significant point of tension in these social units if men feel that their role and identity is threatened by these contributions.

- 2) Perhaps because they have to emphasize their domestic roles to make their income-earning activities more acceptable, women in AAH/ML report much greater rates of concern with access to water for domestic purposes and the function of the mill in the village. This does not seem easily explained by simple issues of access to these resources, as women in HAH/ML have the same roles but did not report these concerns.

This interpretation of women's vulnerabilities in Dobolo/ML05 raises five important points about men's decision-making that have to be considered when addressing these challenges:

- 1) Women play a supporting role in the livelihoods of Dobolo. Their labor is critical to the success of rainfed agriculture (such as this activity is able to succeed). However, when it comes to the production of subsistence staple grains, women cannot play more than a supporting role without threatening men's roles as providers and caretakers for their families.
- 2) Women can participate in groundnut cultivation and gardening, and even do so more frequently than men, as both forms of cultivation make indirect contributions to the household (income from sales is then spent on various household needs).
 - a. Further, the income from these crops is seen as belonging to the person who cultivated it, placing this activity outside household or minor lineage cultivation that is the provenance of men.
 - b. Also, the income from these crops, when cultivated by women, is generally spent on domestic needs and therefore funneled back into the provenance of women, which makes this contribution less threatening to men who have to care for the entire household and minor lineage.
 - c. Redefining women's groundnut production or gardening as staples for the household would likely be seen as an infringement on the roles and responsibilities of men, and be greeted with a great deal of resistance or even co-option.
- 3) Animal husbandry is a man's role, as these assets contribute to rainfed production and meeting the needs of the household and minor lineage in a direct manner. Women can own a limited number of small animals without posing a threat to men's identities, especially if these animals are used for domestic needs in the same manner as the proceeds from women's gardens and groundnuts. However, boosting women's large animal holdings without a significant rise in men's holdings, or a very large increase in the productive capacity of their rainfed agricultural efforts (especially in AAH/ML and LAH/ML) would likely be seen as an effort by women to take over a man's role, and be strongly resisted.
- 4) Interventions that promote garden production, or which boost the production and marketing of groundnuts, fit into existing livelihoods and will not encounter barriers to uptake in the same manner as efforts to boost women's staple crop production.
- 5) Interventions that allow women to augment the domestic sphere, thought broadly, will play into their identities and responsibilities for the domestic sphere in their households and minor lineages. Efforts to boost women's livelihoods in this zone should seek to identify the boundaries of what is considered a domestic purchase or a domestic role, and work to augment resources that are directed toward them as these are likely to be interpreted as within the provenance of women and their roles, and therefore appropriate.

4. *Guile and Sare Mala: ML06/06a: Niger Delta Rice, Cattle, and Fishing/Bozo Fishermen*

Guile and Sare Mala are situated in different parts of ML06, with Guile to the north and Sare Mala near its southern extent. This is an agricultural surplus-producing zone, benefiting from seasonal floods that replenish soils, water rice crops, and produce a broad fertile plain well-suited to livestock grazing. This flooding is critical, because the zone otherwise receives only 300-500mm of rain a year, which is inadequate for all but millet cultivation, and even millet would be very marginal in this zone. Both villages exhibit livelihoods profiles very similar to those described by FEWS NET (Dixon and Holt 2010), with heavy reliance on rice cultivation and animal husbandry as the core of livelihoods activities in the zone and in both villages. Rice cultivation is very productive in this zone. Despite this, food shortage was the fourth most-common stressor (mentioned by 41% of the population) referenced by residents in Guile, with low-yield harvests and short seasons (21% each) also appearing prominently. Concerns for insufficient rainfall (43%), lack of farming equipment (37%), and lack of draught animals (29%) also speak to the need to ensure a productive rice harvest. While agricultural stressors were the most numerous of those mentioned, the most commonly mentioned stressors (at 51% each) related to access to adequate fodder, whether as a general concern of the population or as an issue tied to specific times of the year, especially in March to June, when pastures have been depleted. Thus, the vulnerability context of Guile aligns closely with the larger expected profile of ML06. In Sare Mala, a similar pattern emerged. Concerns for farming inputs (referenced by 86%), irregular and inadequate rainfall (65%), insufficient draught animals (54%), and insufficient farming equipment (38%) were all stressors linked to concerns for poor yields (49%) and food shortage (32%). However, in Sare Mala it is important to note that most of these stressors were constructed around an overall concern for *sufficiency* of access, whereas in Guile the concerns were often about *lack* of access. In other words, those in Sare Mala had access to much of what they needed, but not in the quantities they desired to achieve all their goals. Those in Guile often did not have any access to materials that were fundamental to their livelihoods. Therefore, these communities represent two different situations in the same livelihoods zone.

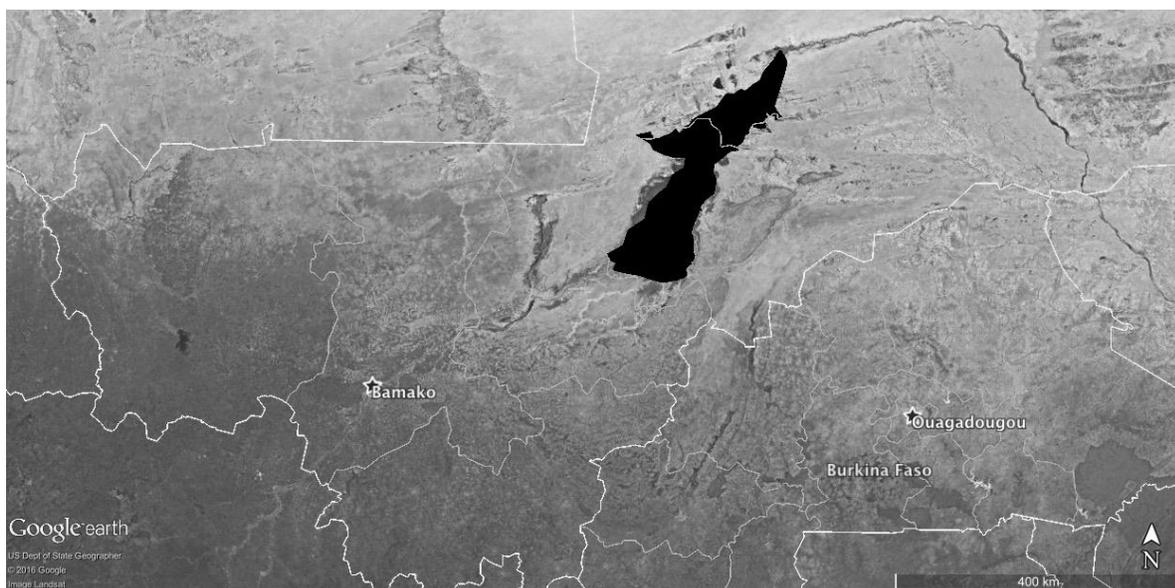


FIGURE 5: Locator map of Zone ML 06

Both communities are home to two dominant ethnic groups: Bozo, whose livelihoods activities center on fishing, but who also farm and raise livestock, and various Fulbe groups whose livelihoods are largely agropastoral. Broadly speaking, Bozo livelihoods are subject to a structure of authority and decision-making very similar to that of the Bambara and Dogon communities discussed elsewhere in this report. They are organized into households and concessions under a single senior man, who is responsible for the decisions of those under his authority. The Fulbe are organized into what were formally cattle camps called *wuro*. These have been loosely described as households (de Bruijn 1995), and are the unit of production in most Fulbe communities. *Wuro* are governed by men, though women have their own space within the *wuro* for herself and her children called a *fayannde*. Women control this space, and the activities in it, such as milking and gathering, though the importance of the *fayannde* depends on the specific Fulbe identity of the people in question. The Weheebe see themselves as a noble class among the Fulbe, those who historically owned cattle and owned slaves that farmed for them. The Jallube were also “free” (unenslaved) Fulbe who cared for the cattle and watched over slaves captured during conflict. The Riimaybe are descended from the slaves captured by the Weheebe and Jallube, and who were responsible for agricultural labor. The *fayannde* is most important in Jallube *wuro*, though it exists in those of other Fulbe groups. These women, especially Jallube women, also often have access to and control over land given to them by their husbands when they establish a *fayannde*. Despite this control, these women – and indeed all women in Fulbe society – depend on their husbands for food. In conducting its analysis, HURDL produced two different sub-community groupings in Guile and Sare Mala. In Guile, the groupings followed access to livelihoods assets, while in Sare Mala the groupings revolved around ethnic and caste identity. This difference largely proceeded from the fact that the field team interviewed very few Bozo in Guile, and therefore they could not be established as a separate group analytically. As it happens, the groups are somewhat consonant with one another, as access to livelihoods resources in Fulbe society is strongly associated with one’s caste, and Bozo fishermen have a completely independent livelihood governed by different goals, stressors, and rules. However, the breakdown of assets in both groups was similar to that suggested by FEWS-NET (Dixon and Holt 2010) for the area. In Sare Mala, HURDL grouped what Dixon and Holt called “better off,” and “middle” into one group comprised of nobles and other free Fulbe groups (30% of the population). The poor and very poor were included in another group of lower caste Fulbe (57%), and Bozo fisherpeople made up the third group (13%). In Guile, the community was broken into three parts – those with high asset diversified livelihoods (what FEWS NET called “better off” and much of the “middle” groups) which were 30% of the population, those with adequate access to livelihoods assets and some nonfarm diversification of their livelihoods (what FEWS-NET could have called the bottom of the “middle” group and perhaps the most wealthy of the “poor”) making up 49%, and finally were those with low access to livelihoods assets and no access to NFE for the diversification of their livelihoods (21% of the population). In the case of Guile, the very small number of Bozo in the sample precluded using them as a separate group, and they were lumped in with the low-asset group. While these breakdowns of the population in Guile and Sare Mala are broadly consonant, HURDL will revisit the stratification of Guile to determine if the structure used in Sare Mala better captures differences relevant to vulnerability and livelihoods.

Group	Animal Ownership	Agricultural Equipment	Nonfarm employment
Free Fulbe Castes	Draught animals and smaller animals	Owens plows and other equipment	Relatively little NFE
Lower Fulbe Castes	Very limited or no animal traction, small animals	Limited access to plows and other equipment	Some caste-specific NFE, fishing
Bozo Fisherpeople	Draught animals and smaller animals	Owens plows and other equipment	Very heavy participation in fishing

TABLE 4: Summary of vulnerability groups and their characteristics in Guile and Sare Mala

While vulnerability certainly is closely related to livelihoods in both villages, livelihoods are not determined by access to livelihoods assets alone. Instead, as in the other parts of Mopti HURDL surveyed, the livelihoods outcomes observed in this zone are the product of different identities, and how the roles and responsibilities associated with these identities play out in the context of the assets they have on hand. In Zone ML06, these identities are more complex than in the other zones, for livelihoods are first determined by ethnicity. The Bozo fish because it is central to their identity, and while they may farm and raise animals, fishing is central to who they are. The Fulbe generally find fishing to be an undesirable activity that can only be conducted for subsistence, not market sale, and even then ideally by members of middle- to low-caste Fulbe groups. Among the Fulbe, animal husbandry (especially oxen and cattle) is particularly valued as a marker of their cultural identity as much as for the value these animals bring in terms of traction and value. While noble Fulbe prefer not to farm, nearly everyone in Sare Mala and Guile mentioned rainfed cultivation as a livelihoods activity in which they participated. Instead, the principle difference that caste makes for Fulbe groups is in NFE, as some activities such as pottery making or serving as a griot belong to a particular caste.

Among the Fulbe groups which dominate Zone ML 06, men are responsible for bringing food to the *wuro* through agricultural work and animal husbandry. The structure of Fulbe society is such that senior men's authority rests on their ability to make decisions for the *wuro* that mitigated these risks and generate enough food and income to meet the *wuro's* needs. While rice production can be very successful in this area, it is subject to uncertainties ranging from the magnitude of the river flood (too little and rice plants will dry up, too much and they will drown and the floods could reach higher fields where maize is planted) to the amount and timing of early-season precipitation needed to help rice seedlings take hold before the floods come. These challenges are exacerbated by the relatively low levels of draught animal ownership in this group, even among the most asset rich *wuro*. As the ownership of animals is central to Fulbe identity, the accumulation of animal assets serves men's efforts to live up to their identities, while also providing a source of food (via dairy products and, more rarely, meat) and a source of capital that can be accessed in case of household need. It certainly helps that those with greater access to animal traction and equipment can cultivate larger areas than their poorer neighbors, which helps mitigate these risks, but having greater assets also creates greater expectations for

good decisions. Gardening is not clearly gendered among the Fulbe in this zone, and men's participation in this activity seems most closely tied to the resources needed (land, seed, inputs, and equipment) than any particular aspect of their identity. This activity was much more common in Sare Mala, at the southern end of the zone, than it was in Guile. Fishing was also more commonly reported in Sare Mala, though this may be a product of the fact that Guile is much further from the nearest river. Artisan work and mat weaving were much more common in Guile.

Men's vulnerabilities emerge at the intersection of these roles and livelihoods, in the context of their access to livelihoods assets through which to enact those roles. For men of free Fulbe castes (Wehebee and Jallube, generally correlating to the high- or adequate-asset access Fulbe in Guile):

- 1) Senior men in this group are preoccupied with their rainfed agricultural production, listing concerns with access to adequate farming inputs, draught animals, and receiving adequate rainfall. At the same time, they report relatively low rates of concern for poor yields, but paradoxically 60% of these men in Sare Mala, and 40% of their counterparts in Guile, reported a concern for food shortage. For these most asset-rich members of what is expected to be a food surplus zone, these concerns are about men's status, not an absolute lack of material needs.
 - a. Early season rainfall is the most critical for this zone, as rice production requires adequate early rains to allow the plants to take before the flood arrives.
 - b. The larger distribution of rainfall across the season is of less consequence in this zone, as maize and other non-flood irrigated rainfed crops are a relatively minor part of the zone's agriculture.
- 2) Among this group, gardening is much more common in Sare Mala than in Guile. Indeed, given rates of participation in Guile, one might interpret gardening as a women's activity, but in Sare Mala gardening is clearly dominated by men.
 - a. The higher rates of gardening in Sare Mala reflect the more constricted landholding in this community, which limits the ability of these men to increase their staple food production. These men would like to own more animals for traction, but given their limited access to land, need garden income to ensure they meet the needs of their families and live up to their roles.
 - b. In Guile, there appears to be less pressure on landholdings, at least among Fulbe residents, allowing for larger rainfed plots and greater yields from this activity. As a result, men do not need to participate in gardening to the same extent to ensure they meet their responsibilities to the household. As a result, we see greater rates of concern for inadequate access to livestock that would allow for the cultivation of larger areas among this group in Guile than in Sare Mala.
 - c. Despite the apparent sufficiency of rice and maize production on the fields of these men, they are clearly very concerned with living up to their role as providers for the family. This is clear in their use of garden crops. In both Guile and Sare Mala, men's garden production has a very significant subsistence component, suggesting that this activity is acceptable for men when it is used to this end.

For men of lower castes (Riimaybe):

- 1) The stressors most commonly referenced by these men are related to rainfed/flood irrigated production, especially inadequate access to farming equipment, draught animals (which are also reported as lacking, suggesting that at least some in this group have no direct access to these animals at all), and concerns for adequate rainfall.
 - a. As with those Fulbe of higher status, those in this group are concerned primarily with the timing and distribution of early season rains that can facilitate rice growth until the floods arrive.
 - b. Those living in Sare Mala are more concerned with poor yields and food insecurity than those in Guile, despite very similar rates of draught animal and farming equipment ownership. Again, it appears that there is a barrier in Sare Mala to rainfed agricultural production, and it appears to be adequate land to allow for extensification.
- 2) Challenges feeding animals and protecting them from disease and death is the second-most commonly mentioned set of stressors for this group. Their rates of animal ownership are lower than in upper caste *wuro*, but they are still substantial and represent a critical stock of wealth that can help these men and their families through the hungry season, and provide for investment in the new planting season. The loss of these animals would be crippling to these individuals, as it would devastate their rainfed production, strip them of needed financial assets, and cost them a great deal of status among the upper-caste Fulbe, on who they depend, to a degree, for access to draught animals and equipment, as these upper-caste Fulbe still privilege animal husbandry above other activities.

This interpretation of Fulbe men's vulnerabilities in Guile/Sare Mala/ML06 raises five important points about Fulbe men's decision-making that have to be considered when addressing these challenges:

- 1) Men will engage in the subsistence production of crops, only marketing a surplus. In Guile, such surpluses were much rarer than in Sare Mala. In Sare Mala, men cultivated a much wider set of gardened crops, and still used nearly half for subsistence only, suggesting that even for a market-oriented activity like gardening, the importance of feeding and caring for the family is primary for Fulbe men.
 - a. Sare Mala has much better market access than Guile, but the men in this community still used nearly half of their garden crops for subsistence only. This suggests that the factors governing the degree of market orientation seen in men's production is not a question of market access, nor is it a question of incomes. Therefore, interventions aimed at market integration may not alter the uses of men's crops such that more income is generated.
- 2) Not all men produce for the same reasons. For men, their degree of engagement with market sale for their garden crops declined with their access to livelihoods assets. Therefore, working on market access and asset access will likely have a greatest impact on the poorer men in this zone.
- 3) Animal husbandry remains a key part of Fulbe identity, even among settled agropastoralists. Further, oxen and cattle are prized over smaller animals like sheep and goats, not only for

their material value but also for their cultural value. As men become more wealthy, they will accumulate more of these animals

- a. This might boost rainfed production as more men are able to prepare fields in a timely manner
 - b. This might place stress on the surrounding rangeland as herd sizes grow
- 4) Nonfarm employment is very limited among the men of ML06. The sorts of NFE that a given man will take up depend greatly on his Fulbe identity. At least initially, the introduction of NFE opportunity will impact low-caste Fulbe like the Riimaybe the most, as they have the fewest restrictions on the activities in which they can participate.

Fulbe women in ML06 are widely understood to be responsible for the domestic sphere, and to a degree the domestic space, of the *wuro*. Among the noble Fulbe, women are expected to stay within the *wuro*, and this expectation is translated across Fulbe women as a characteristic of a good woman, even though the women of other Fulbe groups do leave the *wuro*, labor in gardens, participate in animal husbandry and the rainfed production of the *wuro*, and speak to one another. Women control the income from these activities, including income from the rainfed fields given to them by their husbands. However, their income tends to be spent predominantly on domestic needs in the *fayannde*, turning these activities and their products into means by which women meet their responsibilities to the *wuro* and maintain its domestic space and function. Animal ownership for women is greatly shaped by the asset level of their *wuro*, not because greater assets enable greater animal purchases, but because in more asset-rich *wuro*, men are secure in their role as providers. In such situations, women's ownership of cattle, while providing significant stocks of wealth and means to greater staple crop production, is not threatening to men's identity. As we move into situations where the *wuro* is increasingly asset poor, we find women's animal ownership constrained to poultry, goats and sheep, all animals that, when sold, produce income small enough that it can be plausibly be said to contribute to the *fayannde* without usurping men's role of providing for the *wuro*.

For women of free Fulbe castes (Wehebee and Jallube):

- 1) Water shortage is a significant issue, likely referencing their roles as water collectors in service of the domestic reproduction of the *wuro*.
- 2) In Guile, women are most concerned with rainfed production stressors, with little mention of stressors related to their domestic roles beyond access to water (i.e. access to firewood, healthcare, etc.). In Sare Mala, on the other hand, these women mention stressors around the collection of firewood and the working of the mill. This difference in their reported assemblages of vulnerability speaks to the same roles enacted in two different sites.
 - a. Women are expected to help men meet their responsibilities to feed the household, not replace them in this function.
 - b. In Guile, there is little chance of women doing this because rates of gardening and NFE for women are not very high, and incomes from these activities are also low. In Sare Mala, women have very successful gardening efforts that might threaten men's roles if it was not routed into the reproduction of the domestic functions and spaces of the *wuro*. In this context, the performance of women's roles becomes very important to reinforce the different roles men and women play, and stave off intra-*wuro* conflict over roles and responsibilities while still meeting the material needs of its members.

- c. This speaks to the vulnerability of women's production and incomes in the face of gendered livelihoods roles and responsibilities. Women whose production exceeds what is needed in the *fayannde*, or who otherwise appear to be encroaching on men's roles, will find themselves disciplined for this infraction.

For women of lower Fulbe castes (Riimaybe):

- 1) Their concerns reflect a lack of access to draught animals, farming equipment, materials for NFE work, and fodder for their animals. In short, these are women who have very limited access to the assets they need to contribute to their *wuro*.
 - a. Critically, however, they lack assets that would enable activities that provide them with their own incomes and a degree of autonomy from their husbands and their *wuro*.
 - b. This is likely a product of the stress that their husbands and other men in the *wuro* feel as they fail to live up to the expectations of their identity as providers for the *wuro*, as successful women's livelihoods and associated contributions to the *wuro* would highlight the failings of these men, calling their authority and identity into question.
- 2) This is the only group of women for which access to assets for NFE were a significant part of the assemblage of vulnerability
 - a. This suggests that while these women cannot participate as fully in these activities as they might like, they can engage a wider set of activities than their higher-status counterparts.

Therefore, for Fulbe women in ML06:

- 1) Their principal role in livelihoods is twofold: to support their husbands and other men in the production of adequate rainfed crops to meet the needs of the *wuro*, and to engage in their own activities to ensure the reproduction of the *fayannde*.
- 2) In asset-rich *wuro*, women can own draught animals and cattle and produce larger amounts of staple grain without threatening their husbands'/other men's identity as provider for the *wuro*. In less asset-secure *wuro*, women's ability to own such animals is curtailed as their husbands'/other men's production is often inadequate for *wuro* needs, and women's production could present a challenge to men's identity.
- 3) Women can increase their holdings of small animals, and their participation in activities like gardening and NFE, in low-asset *wuro* without threatening their husbands and other men if those incomes are then directed to *fayannde* needs.

Bozo men and women live under a social structure very similar to that seen among the Bambara and Dogon agriculturalists in ML09, ML05, and ML13. Men are responsible for caring for their families for the entire year, which includes feeding their families. However, unlike with these other agriculturalist groups, there is no expectation among the Bozo that these men will meet this responsibility through agricultural production alone. The Bozo see fishing as central to their livelihoods, with agriculture providing needed supplementary food and animal husbandry offering various supports to agricultural production as well as serving as a source of income in and of itself. In Sare Mala, where the sample included enough Bozo to make some statements

about their discourses of livelihoods, Bozo men owned more draught animals than they needed to cultivate their constrained landholdings. While these men clearly wanted to access more land, they managed to make their constrained landholding an asset by renting out their animals and equipment to the more asset-poor of their Fulbe neighbors. The Bozo have very little diversification into NFE, and are extremely dependent on the river for both fish and the irrigation of their rice.

It was nearly impossible to meaningfully disaggregate the Bozo population because of the very small sample size. However, HURDL identified some gendered vulnerabilities:

- 1) Bozo men are particularly focused on fishing stressors, like obtaining nets, in their livelihoods. Fishing is the most acceptable way for a Bozo man to meet the needs of his household and concession. Farming provides staple food for the household, and animals are useful for traction and as capital to invest in farming and fishing, but in the end Bozo livelihoods center on fishing.
 - a. As with all other rice producers in this region, the Bozo are most concerned with early season precipitation that will allow their rice crops to set up before the flooding starts.
- 2) These men have the most constrained access to land in Sare Mala, so much so that their draught animal holdings exceed their agricultural needs. This limits Bozo rainfed/flood-irrigated production, forcing them to rent out their animals and equipment to poorer Fulbe wuro who need to cultivate their own fields.
 - a. This arrangement, while currently beneficial for the Bozo, rests on a continuing need for Bozo agricultural equipment and animal traction by their Fulbe neighbors. Should the Fulbe improve their animal assets, the Bozo would be left with surplus animals (at least in regard to their value as traction, and in terms of adequate fodder and pasture, and less income. This could result in a transfer of assets from Bozo households and concessions to Fulbe wuro, leaving Bozo more vulnerable to the shocks and stressors they currently negotiate through their livelihoods.

Bozo women have responsibility for the domestic sphere of their households and concessions. As with the women of many other groups in Mopti, they control the proceeds of their own gardens, fishing, trade, and other NFE, but generally spend the proceeds of these activities on the domestic needs of the concession and household. Because of the extraordinarily small sample of women interviewed in this zone, it is difficult to generalize about their vulnerabilities beyond some broad observations.

- 1) The Bozo women in this sample did not express concerns for fishing-related stressors, perhaps because they do not themselves fish.
- 2) Instead, Bozo women were preoccupied with stressors related to rainfed agriculture, with food shortages and poor yields outcomes with which they were particularly concerned.
- 3) Like their Fulbe counterparts, Bozo women referenced concerns for access to adequate firewood and a working mill.

This limited understanding of Bozo men's vulnerabilities leads to four important points when considering interventions to address these issues:

- 1) Bozo fisherpeople will not abandon fishing as a central livelihoods activity, as it is central to their identity as Bozo.
- 2) Bozo fisherpeople are currently relatively food-secure, and therefore their desire to access more farmland is not a reflection of a need to make ends meet, but instead a desire to improve this production. The extension of Bozo landholding, however, would likely come into conflict with Fulbe agropastoralists who are much more dependent on rainfed production for their livelihoods.
- 3) The success of Bozo livelihoods is most evident in the fact that Bozo men enjoy excellent access to draught animals, equivalent to that in the highest asset access groups of the Fulbe Guile and Sare Mala. Therefore, they have the assets to cultivate larger plots of land, but currently leverage those assets into income by renting them to their more asset-poor Fulbe neighbors. This has, thus far, prevented significant conflicts between the groups over landholding.
- 4) The Bozo in Sare Mala are not nomadic, but effectively settled fisherpeople with a large agropastoral component to their livelihoods. They have made the decision to settle themselves, and adjusted their livelihoods accordingly. Any efforts to further settle Bozo in other parts of ML06 should explore the differences in livelihoods between those Bozo in Sare Mala and any Bozo groups that are still migrating seasonally to understand how such settlement can happen in a productive manner.

Other Major Findings and Lessons Learned

Identity, Livelihoods, and Vulnerabilities

As suggested by Gaillard (2010), the connection between livelihoods activities and vulnerability is very strong across all identities in all zones. However, this connection is not merely a function of the ways in which these activities are exposed to different shocks and stressors, but more deeply a product of how expectations of different identities play out in the context of this exposure. Thus, women in Zone ML09 may find their garden production highly exposed to market fluctuations such that they can make little profit, but they cannot pivot to rainfed staple grain production for to do so would threaten their husbands' identities as providers for the concession. Thus, their livelihoods are very sensitive to garden crop market fluctuations, and they have little capacity to adapt that production or their overall mix of activities to adapt to market stresses and shocks.

In all four zones explored in this behavioral baseline analysis, the connection between the vulnerability context and livelihoods decisions ran through the ways in which particular activities mobilized and reinforced the different identities in each community and zone. It is not possible to accurately describe or explain the decisions of any group in these zones without an analysis that takes this connection into account.

Part of the goal of conducting a LIG analysis in the different livelihoods zones in Mopti was to move away from an a priori stratification of the population by externally-imposed social differences and toward the identification of social differences relevant to decision-making and

conduct of livelihoods activities in each zone. After conducting this analysis, and considering findings from other assessments where possible (for example, the Zone ML09 discussion in Carr, Onzere, et al. 2015), we suggest the following stratifications for future data collection:

Zone ML 09 (and other zones dominated by Bambara, Senoufo, and Malinke agriculturalists): divide the overall population by concession-level (unless the individual belongs to an independent household, in which case use the household as the unit of analysis) access to assets such that this access produces notable differences in the conduct of livelihoods. Within each group, stratify the population by identities at the intersection of gender and seniority.

Zone ML 05 and ML 13 (and other zones dominated by Dogon agriculturalists): divide the overall population by the asset access reported by the household or minor lineage to which the individual belongs. Within those minor lineages and households, stratify the population by identities at the intersection of gender and seniority.

Zone ML 06: Bozo Fisherpeople: Divide the population in the same manner as under ML 09

Zone ML 06: Fulbe Agropastoralists: Divide the wuro by their castes and social rank, at least such that “free Fulbe” (i.e. Wehebe and Jallube) are in one group and “low caste” Fulbe (i.e. the Riimaybe) are in another. More than just a reflection of historical differences among the Fulbe, the specific Fulbe identity of an individual speaks to the activities they privilege in their livelihoods, and the NFE activities they can undertake within their identities. Depending on the setting, it may be necessary to subdivide the free Fulbe to accurately capture the differences in livelihoods and livelihoods decisions at play in a community. Within these caste-based group, subdivision by gender is a minimum requirement, though seniority does appear to have an impact on Fulbe identity such that it creates different livelihoods priorities and decisions.

Identity, Livelihoods, and Interventions

The behavioral baselines established in each of the four livelihoods zones make it clear that implementers should consider who the intervention targets – not who the intervention is *intended* to target, but who does the work and has the authority over the activities and decisions affected by that intervention. Fundamentally, if interventions in each of the four zones are to engage women and improve their resilience and overall situation, those interventions must 1) be targeted to activities over which women have control and authority and 2) must contribute to those activities in a manner that, in the short run, aligns with expectations for women’s roles. This does not mean that interventions cannot aim for transformative outcomes for women, but that the interventions must develop theories of change that start from what is acceptable and possible in the present, and consider how the adoption of particular activities or information sets up pathways to transformative change for women. Below, we address both the constraints and opportunities facing the key interventions (numbered based on MCCA Base Period Work Plan) proposed by MCCA in light of the data from the behavioral baseline.

1.1.7 Greater involvement of women's groups in the collection and transmission of data.

This includes the challenges under interventions: *1.1.2 Training of producers, technicians, NGOs, communities/commune authorities, radio stations; 1.2.6 Procure rain gauges for participating, new villages, and demonstration farmers; 1.3.2 Provide training for installation, reading, and reporting of rain gauges in new villages; 2.1.2 Identify new villages and train focal points in new target villages*

- Challenge: Data Collected by Rain Gauges

Data collected via rain gauges is most useful for rain-fed staple grain production. In each zone, and for all ethnicities in those zones, women (unless they head households) do not make agricultural or livelihoods decisions related to the rainfed production of staple grain crops for the concession (Bambara and Bozo in Zones ML09 and ML06), minor lineage (Dogon, in Zones ML13 and ML05), *wuro* (Fulbe in Zone ML06), or household. There are only two exceptions to this that we observed:

- 1) Women heading households: In households with women heads, women do make decisions about the production of staple grains. However, these households are highly stressed and asset-limited, lacking ownership of plows and animal traction, and therefore deeply constrained in their production of rainfed staple grains. Even if they are receiving information about the amounts of precipitation that have fallen, and even if that information is tied to actionable advice about what those amounts of precipitation mean for agricultural strategy, these women will generally have to wait until men have completed their own agricultural tasks before they can gain access to these resources. This means that these women generally plant later in the season, and have less flexibility in what they plant (both crops and varieties) than men, making data on precipitation of relatively low utility for women heading households.
- 2) Women's groundnut production in Zones ML09 and ML13: In these zones, women do make decisions about their own plots of groundnuts. However, these plots are small and generally seen as means by which women raise the income necessary to reproduce the domestic space and function of the household. They are not prioritized in either concession/minor lineage/*wuro*-level decisions, or in household production. Instead, these plots are cultivated after all concession/minor lineage/*wuro* plots are cultivated, and generally after men's household plots are cultivated. Therefore, as in households headed by women, women's groundnut production is too limited, and comes too late in the season, to make a great deal of use of precipitation data. Further, in these zones, women's production is small enough to be constructed as "domestic" and therefore not a threat to men's roles or authority. Were women to boost their groundnut production and income significantly, this construction is unlikely to hold. If they feel women are usurping men's roles and responsibilities, men are likely to discipline these women, for example by constraining the size of women's plots (for example, as seen in Ghana in Carr, 2011, 2008), redefining groundnuts as a men's crop that justifies the appropriation of women's production (for example, as seen in rice production in the Gambia in Carney, 2004), or by the use of violence, both verbal and physical, against women who persist in playing "men's roles." Therefore, even if precipitation data can assist women in achieving greater

peanut production, women are unlikely to utilize this data to the fullest if it sets up a situation where their production becomes a threat to their husbands.

Beyond having low utility for women, precipitation data is most relevant to activities over which men have authority and responsibility. Assigning women roles that might shape men's ability to live up to their responsibility to feed the family represents an inversion of existing roles and responsibilities among men and women. Therefore, targeting greater participation by women in rain gauge data collection and dissemination is problematic in four ways:

- 1) It is extraordinarily unlikely to work, given what the rain gauge data is used for (informing rainfed staple crop production) and who has the authority to make decisions about that activity (men, especially senior men heading concessions/minor lineages/*wuro*). Women are not likely to see participation in such activities as a benefit to their livelihoods activities, and men are likely to view women's participation in these activities as a challenge to men's roles as providers for their families via rain-fed staple grain production.
- 2) Even if the project succeeds in getting more women to participate in rain gauge data collection and dissemination, it is not clear that this will produce meaningful benefits for women. Their livelihoods activities, roles, and responsibilities generally preclude the use of such information.
- 3) Further, if women are viewed as occupying a man's role, they are likely to attract social sanctions ranging from verbal abuse to physical violence until they abandon this activity and return to their "appropriate" place.
- 4) Finally, in most parts of Mopti women are expected to stay at home unless they are given permission by their husband or another senior man to move around the community. This could be a final barrier to women effectively participating in the reading of rain gauges and the dissemination of those measurements.

Finally, we note that in Mopti generally it was difficult to find women who were numerate and literate enough to work with rain gauge data. The agrometeorological advisory program in Mali, which has been delivering advisories to farmers for more than 30 years, was predicated on literacy programs to ensure the observers could manage the data. Therefore, some consideration of educational opportunities is necessary if women are to be fully engaged. This becomes more complex in areas like Zone 6, where the population adheres to a somewhat more rigid interpretation of Islam than seen in other zones or the southern part of the country, many in the population will see formal education as less legitimate than, and perhaps a challenge to, madrassa education.

- Transformative pathway: Data Collected by Rain Gauges:

The behavioral baseline observed that in households/ concessions/minor lineages/*wuro* that are asset rich and whose income and food supply are secure, there is less pressure on women to rigidly conform to expectations of their roles and responsibilities. In these settings, we find women earning more money and raising more food from their garden, animal husbandry, and NFE activities without threatening the roles and authority of their husbands and other senior men because these men are very secure in their role as provider for the family.

- 1) In contexts where peanut production is significant and women commonly engage in this production (ML 09, ML13), working with women cultivators to identify what information would be of use *given the constraints on their production*, such as timing, limited access to land, and in the case of junior women a very heavy domestic labor load that comes on top of agricultural and other livelihoods responsibilities. These women know how much they can produce, and what steps they can take to increase their production to this level, given this information. It is possible that women could participate in data collection and dissemination for this narrow purpose without appearing to transgress their roles and responsibilities, especially if they are tasked with communicating this information to other women. However, it is critical that any such plans be carefully vetted with these women, as it is possible that the senior men running concessions/minor lineages/*wuro* or husbands might see the use of information over which they have no control by their wives as a challenge, especially if it causes their wives to disregard men's advice about agricultural strategy. Women will likely know contextually-specific ways of providing information to one another, and acting on that information that will prevent such conflicts. This strategy is most likely to succeed among senior women in asset-secure households/concessions/minor lineages/*wuro*, as in more asset-challenged settings men tend to enforce roles and responsibilities more rigidly. Such interventions, while very narrow in the short term, create a basis upon which women can make claims to authority over certain forms of information that, over time, might serve as a foundation for larger claims about their women's capabilities that can extend to other women in the community, expanding their roles and responsibilities.
- 2) In all contexts, consulting with senior women, especially those in asset-secure contexts, to identify potential pathways of use of this information by women is likely to yield productive ideas. These women often have a degree of voice in the agricultural strategies and practices of the concession/minor lineage/*wuro*, and therefore will understand the degree to which women might be able to employ this information to shape agricultural strategy.

- Challenge: Market Data

Data on markets might serve a much wider audience and a wider set of roles and responsibilities. Men in all zones market *surplus* staple grain production. Providing information on the market prices of such production, perhaps in the present, but more likely as projections across the season, could help these men shape seasonal agricultural strategy. For example, if sorghum prices are expected to be high near the end of the season, these men might decide to plant in a manner that targets more sorghum surplus than millet surplus to maximize the income from this surplus production. However, it is important to note that in all zones, and for all ethnicities, staple grain production is valued first and foremost as a source of subsistence, and helps men meet their responsibility to feed their households and larger families (concessions/minor lineages/*wuro*). Men are therefore likely to employ market data and projections at the margins of their staple grain production decisions, not as a central part of their decisions. The benefits of this information will clearly accumulate to those wealthier, asset rich men who are likely to produce such surpluses. To the extent men find this information useful, MCCA will have to coordinate with farmers and middlemen to ensure that the actions farmers take in response to this

information results in a greater return to the farmer, as opposed to concentrating profits with middlemen and marketers in the major market areas.

Market data is more useful for decisions related to animal husbandry, fishing, and market gardening. While some Fulbe in Zone ML06 will fish for subsistence, marketing fishing is seen as inappropriate for their identity and therefore extremely rare. Instead, Bozo fisherpeople in ML06/ML06a dominate fishing for market sale. While market prices for fish might help these fisherpeople better understand the markets in which their fish will bring the best prices, it is not clear that most Bozo have access to a range of markets such that they could take advantage of this information. Further, women's participation in fishing, even among the Bozo, appears to be very low, suggesting that market data on fish prices would likely serve to inform men's decisions. A much wider range of residents of each zone participate in animal husbandry and gardening. However, it is critical to provide market information for *specific* animals, as the ownership of oxen, cattle, horses, goats, sheep, and fowl is not evenly distributed through the population. Generally speaking, few women own oxen, cattle, or horses. Similarly, those in low-asset situations, whether men or women, do not own these animals. In both cases, market prices for these animals will be of little use. The ownership of goats, sheep, and various fowl is nearly ubiquitous in all zones, even among those with low-asset livelihoods. Understanding current prices and price trends, as well as locations in which the highest prices can be found, will help men and women of all ranks and asset levels plan the sale of their animals and garden crops. However, there are limitations to the utility of this information, even for gardening and animal husbandry. First, animals are often owned and sold to address acute needs in the household, such as a family member who needs medical care. In such situations, animals will be sold regardless of market price. Second, there is little by way of a viable cold chain between Mopti generally and the larger markets to which garden crops might be sold. As a result, it is nearly impossible for farmers to hold their crops and time the sale at market peaks. The only control those who garden exert over the timing of their sales is the timing of the planting of their crops. Here again, work with middlemen and farmers is critical to ensure that the benefits of this information accrue to the farmers, instead of concentrating in the hands of middlemen or retailers.

Labor market data is not likely to be of significant utility in Mopti. Such information is perhaps most useful for junior men in high asset households/minor lineages in Zone ML13, where seasonal migration was mentioned as a livelihoods activity. Otherwise, most nonfarm employment seen in the four zones was very local. This information might help those seeking NFE, especially in the season between harvest and planting, identify appropriate destinations. However, many seasonal migration decisions are based upon individual networks and contacts, and it is not clear the degree to which these networks afford residents of these zones any choice in their destinations.

- Transformative pathway: Market Data

Providing information about current and expected future market prices for animals and crops has the potential to change livelihoods decision making for nearly all residents of Mopti, regardless of age, seniority, ethnicity, or zone of residence. However, these changes are not likely to manifest as major jumps in income or material circumstance. Asset-rich livelihoods will likely benefit most from information on animal prices, as they have the greatest ability to take

advantage of this information because they own enough animals that there are still some to sell, even if acute challenges arise. In years where they do not face acute challenges, moderate-to-poor asset access livelihoods will likely also take advantage of this information, but with fewer animals, the impact on their incomes will likely be small. However, small changes in income are often leveraged into substantially large income gains when profits are reinvested into livelihoods activities, which suggests that over several seasons it is possible that even those with asset-poor livelihoods will see noticeable changes in their livelihoods security. The same is true for garden crop market data. Here, however, the utility of this information is constrained by two factors. First, Mopti lacks a viable cold chain, which means that prices must be accurately predicted as many as three months in advance to allow farmers to make decisions about the timing of their crops. Second, gender roles are such that women can use this information to inform their gardening strategies, but they must carefully watch their incomes to ensure that they remain at levels acceptable to their roles. However, the provision of this information could 1) drive demand for a cold chain and better transportation linkages, which can spur future development efforts and 2) slowly augment women's incomes such that the baseline for "acceptable" incomes slowly rises over time without generating major social stress. We note that both of these outcomes are outside the scope of MCCA, and only suggest that one outcome of the project could be to catalyze demand for future projects which meet these demands.

- Challenge: Flood Level Data

In Zone ML06/ML06a, the timing and magnitude of river flooding is a critical determinant of staple grain production. This timing data tells farmers when they have to plant rice in order to have viable plants when flooding begins. Magnitude speaks to which rice and maize fields farmers should plant. In all cases, this information is most directly useful to men who make these agricultural decisions, with women gaining a secondary benefit from the greater availability of grains in the household.

- Transformative pathway: Flood Level Data

While providing this data will reinforce the roles and authority of men, increasing levels of income in concessions and *wuro* and their households generally result in situations where women's roles are relaxed, and they can take on new activities or generate larger amounts of income because they are not threatening to men's roles and authority. Thus, over time, augmenting the food and income of these concessions and *wuro* will likely create opportunities for women to change their material and social situations.

- Challenge: Animal disease data

The behavioral baseline identified significant concerns for animal health and mortality in all zones. To the extent these diseases are tied to patterns of weather and climate, the provision of information about the prevalence and spread of animal disease, as well as advice on how to avoid such diseases, would likely be of use to most residents of Mopti. However, as with market data, to the extent any disease is species-specific, the value of this information will change for different people. Diseases that affect cattle, oxen, and horses are concerns for the relatively

wealthy, and usually concerns of men. Diseases affecting sheep, goats, and poultry are likely to be of wider concern, across identities and income/asset statuses.

3.1.1 Link users of improved seed to USAID FTF partners and other actors who can supply improved seed

- Challenge

A critical challenge for 3.1.1 is that of *what improved seeds are available*. If improved seeds are largely concentrated in rain-fed staple grains, women will have little opportunity to use this seed as they do not make decisions about this activity. While they may work on rain-fed agricultural plots, they do so under the direction of their husbands and other senior men in their families. Therefore, making a women or women the focal points for improved seed information and distribution would create significant social stress, challenging the role of senior men as agricultural decision-makers in their concessions/minor lineages/*wuro* and likely attracting significant sanctions for transgressing women's roles in this arena. Further, even if men were to allow women to serve as focal points, any information conveyed by these women with regard to improved seed and agricultural strategy would lack legitimacy and likely see significant challenges to uptake.

- Transformative pathway

The only current avenue for women's participation in these activities are in households headed by women (which are severely asset-stressed, and likely lack asset to needed inputs for improved seeds) or, in Zones ML09 and ML13, where women cultivate peanuts on relatively small plots. In the latter situation, it makes sense that women could become focal points, at least initially for other women, as women will have to plant their farms later, and often with less access to agricultural equipment and good soils, than men. Therefore, their needs for improved seeds will likely be different than those of men, which creates the opportunity for women focal points who improve women's production, thus participating in the activity, tailoring seeds to women's needs through their greater understanding of these needs, yet playing a role acceptable for women in this context.

3.1.5 Village-level, climate change resilience committee trained

This includes the challenges under interventions: *3.1.6 Identifying adaptation options already practiced and those that can be promoted in the initial target areas*.

- Challenge:

For women to participate in village climate change resilience committees, their roles must be clearly defined as fitting into "appropriate" activities for women. This suggests that women in the village-level committee might form a sub-committee on women's activities and responsibilities. This has two utilities. First, it will allow women to communicate their unique and specific concerns to the larger community committee. Second, it will build the legitimacy of women in the village-level committee, gradually creating a space in which they can have a voice

in wider household and concession/minor lineage/*wuro* decisions about livelihoods. This sub-committee will identify activities for which women might serve as demonstrators, focused on “women’s” activities.

This “women’s sub-committee” should be initially focused on the following activities:

- All zones: Gardening, nonfarm activities such as trade
- Zones ML09 and ML13: groundnut cultivation by women (uniquely challenged, see discussion above)

In addition to these subjects, women in Mopti should be carefully consulted about the decisions they are allowed to make about animal husbandry. While women own and control animals across the four zones surveyed in the behavioral baseline, giving women a wider voice in the husbandry and marketing of animals could present a challenge to men, who also participate in this activity. For example, in Zone ML13 and ML05, many women own animals as part of their dowry, and therefore discussions among women about how to maintain these animals may not present a threat to men.

The constitution of the village committees must take into account the following critical differences, ensuring participation across the following social cleavages:

- Zones ML05, ML09, and ML13: gender, seniority (junior or senior, as this rank intersects with gender to shape individual decision-making and activities), level of asset ownership (as those with fewer assets may follow the same livelihoods decision-making structures, but experience unique stresses as they do).
- Zones ML06/06a: gender, seniority, ethnicity, (among the Bozo) level of asset ownership, and (among the Fulbe) caste.

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