

**A Behavioral Baseline Study to Establish
Livelihoods Decision Making in Mali
Livelihood Zone 09**

for the

**Building Resilience and Adaptation to Climate
Extremes and Resilience (BRACED), Mali**

Prepared by: Sheila N Onzere and Edward R Carr, with Tshibangu C Kalala,
Helen Rosko and Janae Davis

Humanitarian Response and Development Lab (HURDL), Clark
University

Acronyms

BRACED - Building Resilience and Adaptation to Climate Extremes and Disasters

FEWS - Famine Early Warning System

HAL - High Asset Livelihoods

HURDL - Humanitarian Response and Development Lab at Clark University

LAL - Low Asset Households

LIG - Livelihoods as Intimate Government Approach

ML09 – Mali Livelihood Zone 09

NFE- Non Farm Employment

PAAL - Precarious Adequate Asset Livelihoods

SAAL - Secure Adequate Asset Livelihoods

Introduction

Between May and December 2016 the Humanitarian Response and Development Lab (HURDL) at Clark University undertook a behavioral baseline study for the Building Resilience and Adaptation to Climate Extremes and Resilience (BRACED) program in Mali. The purpose of the behavioral baseline was to examine the logic of decision-making related to livelihoods within the project's target intervention areas in Mali Livelihood Zone 09, West and central rainfed millet/sorghum (ML09) with the aim of identifying:

1. *Who is vulnerable to what stresses and shocks:* While individuals experience numerous shocks and stresses that are particular to their life circumstances, the behavioral baseline seeks to systematically organize these stresses and shocks to help identify which groups of people are vulnerable to what shocks and stresses within a given geographical and social context.
2. *Why particular groups of people experience particular assemblages of vulnerabilities:* While within the same context people may be exposed to the same stresses and shocks, their vulnerability is a result of more than this exposure. People's sensitivity to, and their ability to adapt to stresses and shocks have a profound impact on how particular expressions of vulnerability emerge for different people. The behavioral baseline explains why people may have significantly different vulnerabilities even when they live within the same environmental, social, economic and political context.
3. *The behavioral impact of the intervention:* Interventions often can be associated or even correlated with observed changes in livelihoods activities or other behaviors. However, 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) requires an explanatory understanding of how that intervention produced an observed change. The behavioral baseline provides such an explanatory framework for understanding how why particular vulnerabilities are associated with certain individuals and how the composition of these vulnerabilities and people's responses change over time.
4. *How particular interventions are likely to have an impact on people's livelihood contexts:* Risk and vulnerability related to climate change and variability are only one part of a complex array of considerations people take into account when seeking to achieve varied and dynamic livelihood goals. At the same time, interventions aimed at increasing resilience to climate change and variability (such as BRACED) are not neutral and interact with these considerations in unexpected ways. For example, they may increase the power of particular actors within the concession or household to access and use resources to meet their livelihood goals while significantly diminishing this capacity in others. Interventions, therefore, not only alter the material and social

world in ways that augment or compromise existing behaviors related to how people manage risk and vulnerability, they also provoke changes in access to resources, power, and material conditions that, in turn, alter the very livelihood pathways and risk management strategies people can choose. The behavioral baseline provides a way to understand and explain the complex ways in which new livelihood pathways and risk management strategies are forged.

This report begins with a discussion of the methodology and the data collection processes. In the second section, we outline the approach used for coding and analyzing the data. The third section presents a summary of results from village-specific behavioral baselines and outlines some considerations for development and resilience building interventions. The last section presents the conclusions of the report.

1. Methodology and Data Collection

The methodological framework

The behavioral baseline was conducted in order to understand the existing logics of livelihoods decision-making within BRACED intervention areas. As Carr et al (2016) note, to build such an understanding requires a general theorization of livelihoods behavior within a particular context. HURDL's Livelihoods as Intimate Government (LIG) approach (Carr 2013; Carr 2014b) provides a basis for such theorization by focusing on livelihoods decision-making as a basis for theorizing observed behavior and people's vulnerability. The framing of livelihoods under the LIG approach, however, is significantly different from current dominant framings, which focus heavily on the material aspects of livelihoods. LIG returns to the original framing of livelihoods as the ways people live in particular places, encompassing how they derive meaning and legitimacy from their livelihoods as they strive to meet multiple and sometimes competing desires and goals (see Scoones 2009; Scoones 2015 for discussions on the history of livelihoods approaches). LIG acknowledges an intimate relationship between livelihoods and the environmental and material conditions in which people are embedded, as vulnerability and resilience are invariably connected to the need to manage various shocks and stressors, and sustain daily needs. But livelihoods are more than efforts to manage the environment and improve material circumstances (Bebbington 1999). They also reflect people's efforts to achieve happiness, to meet and live up to social expectations, to mobilize power and influence within particular social contexts. Under LIG, therefore, decisions people make in pursuing their livelihoods are examined as efforts to govern their world by reconciling social, material, and cultural demands to achieve desired goals - goals that are varied and dynamic, within the community, within the household, even for individuals as they move through time and space.

Under LIG, efforts to govern the world emerge at the intersection of three conceptual areas: discourses of livelihoods, mobilization of identity, and tools of coercion (see Figure 1). Discourses of livelihoods seeks to understand perceptions different actors have of the livelihood activities they are engaged in and the language they use to characterize these activities. These perceptions and representations speak to why particular activities and practices are seen as desirable, problematic, appropriate, or inappropriate in a particular context. The mobilization of identity seeks to explain how these discourses of livelihoods (re)produce different roles and responsibilities attached to particular people and how this in

turn reinforces existing discourses of livelihoods and results in observed patterns of engagement with livelihood activities. The close relationship between discourses of livelihoods and the mobilization of identity serve to structure expectations of who undertakes what activities and how they should to carry out these activities. However, the logics they produce do not adequately explain the regularity and ubiquity of observed patterns of participation in various livelihood activities. After all, livelihoods strategies generally produce variable incomes and outcomes across members of a community or household, outcomes that can produce frustration and potentially resistance among some actors. These stresses are managed through locally legitimate, widely agreed upon and shared social institutions and means or “tools of coercion” that can be employed to circumscribe the behavior and choices through reward, punishment or simply through limiting the access to important resources. The three conceptual areas (discourses of livelihoods, mobilization of identity, and tools of coercion) overlap significantly, but in context-specific ways that play out differently for different people in any given context. However, in the practice of everyday life, the overlap of these areas creates locally-specific “social facts” which define, bound and set the course of possible livelihoods action and legitimate alternatives, and consequently observed livelihood outcomes (Carr et al. 2016).

The LIG approach and its framing of livelihoods decision-making has been utilized effectively in assessments of whom and why small scale farmers use weather and climate information (Carr 2014a; Carr et al. 2015a; Carr and Owusu-Daaku 2016; Carr, Fleming, and Kalala 2016) as well as to assess rural communities’ needs for hydro meteorological risk early warning (Carr et al. 2015b). In this report, we utilize the approach to characterize current patterns of livelihoods decision-making within BRACED target intervention communities, therefore providing an explanatory basis for understanding existing patterns of vulnerability, ways people manage this vulnerability, how the project’s interventions might produce changes in livelihoods related behavior and outcomes within these communities, as well as a frame within which observed changes around interventions might be interpreted to better understand their impact.

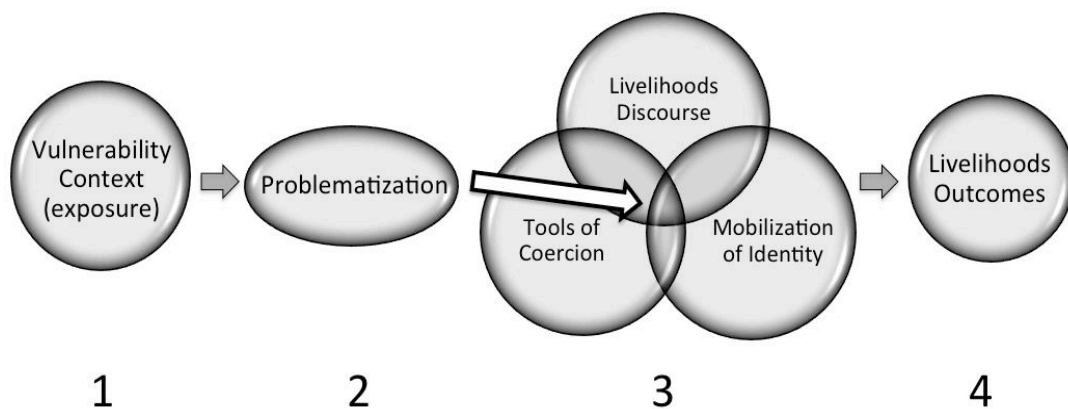


Figure 1: Conceptual diagram of the LIG approach (Carr 2014).

Figure 1 above is the conceptual diagram representing the LIG approach. In summary, diagram outlines that in 1) identifying current challenges to human well-being and

livelihoods outcomes (the vulnerability context) 2) moments where particular stresses become identified as problems by particular individuals produce instances where the logic and legitimacy of livelihoods strategies are called into question (problematization) 3) which, in turn, provides a point of entry into understanding how livelihoods decision making is formed and emerges at the intersection of the mobilization of identity, livelihoods discourses and tools of coercion 4) this then forms the basis for interpreting livelihoods strategies and outcomes¹.

Data Collection

The collection of data and analysis within the LIG approach involves three separate stages: the collection of in depth qualitative data; the organization of data for analysis; and, the analysis and interpretation of observed patterns within the data.

HURDL worked with the BRACED Mali team to identify research sites for the behavioral baseline using several criteria. As in previous behavioral baselines, the team utilized the Famine Early Warning System (FEWS NET) defined livelihood zones (see Dixon and Holt 2010; Famine Early Warning Systems Network 2015) as the broadest level at which a generalization of behavioral baseline findings would be valid. The BRACED Mali team suggested the behavioral baseline be carried out in ML09- a priority intervention area for the project. Because the analysis of LIG data relies on in-depth, qualitative data, and because the aim of a behavioral baseline is to understand livelihood decision-making processes and relationships rather than to obtain a quantification of livelihood activities, it is imperative to identify a social scale where people share social norms, are embedded within the same environmental and broad social-cultural and economic contexts, and that are representative of the wider livelihood zone. Taking this into consideration, BRACED and HURDL identified the village as the most appropriate spatial and social scale at which the behavioral baseline should be conducted. We identified two villages, Timessagou village and Diarani village, as representative of ML09 with regard to the composition of livelihood activities, ethnicities, age and gender.

BRACED worked with HURDL staff to select four field researchers to conduct the behavioral baseline. Together with the HURDL field supervisor, these four researchers formed the field team. The initial stage of data collection included an intensive training period for the field team to learn basic LIG concepts as well as the tools for collecting the in-depth ethnographic data. In addition, there was an in-field training period where the field team practiced the data collection methodology and tailored the LIG approach to the social and cultural context of ML09. During the actual data collection period the team was divided into two smaller teams, each composed of a man and woman. This gender differentiation of the field team was critical to ensure access to both men and women during the field research. Local social norms can make it difficult for men to interview and observe women and vice versa. Moreover even where a man might be able to interview a woman, or a woman a man, social conventions might prevent the interviewee from answering questions fully to an interviewer of a different gender. The two field team members then carried out

¹ As Carr et al. (2016) note this conceptual diagram of LIG is an explanation of livelihood decision-making and does not address the feedback loops between the various areas of livelihood decision-making.

data collection in a single village. The HURDL field supervisor oversaw data collection and assisted the field team in organizing their data and selecting the interviewees within the two villages.

Data collection, as in previous LIG behavioral baselines, took place in two phases (see Carr 2014a for a detailed discussion of the execution of the LIG approach). In both data phases, the field team lived within the community and collected in depth and complex data on livelihood vulnerability, resource access and ownership, roles and responsibilities, appropriate and expected livelihood activities and actions, and the social and institutional means through which the behavior of individuals within the community can be influenced. The interviews were conducted in Bambara or Dogon, the languages most commonly spoken in the two villages. However, the responses were recorded on paper by the field team in French. At the same time, the field team used their residence (8 weeks in total) in the community as an opportunity to triangulate and deepen the interview data through observation and conversations with community members.

During the first phase of data collection, the field team spent three weeks interviewing community members about their vulnerability context and the general composition and organization of livelihoods within the two research sites. The first objective of this phase was to gain insight into different experiences of the vulnerability context, and understand how these experiences clustered such that each community could be stratified by groups with shared assemblages of vulnerability. The second objective was to capture the livelihoods activities from as diverse and wide a range of residents within the two villages as possible. In understanding the range of livelihood activities undertaken within the two communities, as well as who carried out these activities, the field team also identified contradictory claims about which community members carry out certain activities and why. These contradictions were important points of entry for subsequent conversations about livelihoods decision-making. The second phase of data collection was aimed at understanding the three conceptual spheres (see Figure 1) that shape livelihoods decision-making. During this phase, the field teams collected in depth information, sampling within the groups of individuals identified as sharing assemblages of vulnerability during the first phase of data collection.

At the end of the data collection period the field team had completed a total of 180 in depth qualitative interviews (90 in Timessagou and 90 in Diarani) handwritten in French. However, four interviews from Diarani were incomplete. These interviews were not used during the analysis of the Diarani data. The final Diarani data set therefore is 86 interviews.

2. Coding and Analysis

Preparation for Analysis

The interviews produced a large, complex dataset on livelihoods decision-making. HURDL's field supervisor scanned and emailed the interviews back to HURDL lab at Clark University for translation into English (the translation was necessary since the majority of the HURDL analysis team is Anglophone) and analysis. To guard against the loss of the integrity of the data through lost meaning and incorrect translation, the translation team was composed of individuals with significant experience living in Francophone Africa or working with qualitative data from the Sahel. The translation team also met regularly to ensure there was a

coherent and common understanding of the translation of idiosyncratic words and phrases. Once the translation was complete, the interviews were imported into MAXQDA, a qualitative analysis support software, and the coding process began. The use of a qualitative analysis support software allowed for a logical and coherent management of the large amount of data gathered for the behavioral baseline. The team utilized a codebook developed for previous work in Mali to guide the coding team (this codebook is attached as an appendix). The codebook outlines what type of information, topics or passages should be included under “parent” codes - broad conceptual codes, which correspond to the LIG framework. Since livelihood activities, discourses, roles and responsibilities varied within and across the two research sites, particular descriptive sub-codes under each of the parent codes were not included in the codebook. Instead, the coding team, through an inter-coder agreement process, developed these sub-codes as they worked with the data. If one member of the team identified an important theme within interviews, the theme was added to the code system within MAXQDA and discussed with other team members. Each week the team then went through the coding structure, merging or splitting codes after discussing their potential utility to the analysis process. In this way, the coding structure for the behavioral baseline was iteratively improved to assure the best structure and consistency of the coding process across all the coding team members. After completing the coding process for a livelihood zone, one team member cleaned the data for a second time. The team member was tasked with carefully reviewing the coded segments to remove incorrectly coded information and add omitted codes, as well as double checking that the coding had been consistent across all team members.

At the end of the coding process the team had created 12,332 reference points (codes) for Timessagou and 12,573 reference points for Diarani that were then used in data analysis.

Analysis

As an initial step in the analysis of the data, the coding system and structure were revisited and refined. As Carr et al. (2016) note, revisiting the coding structure at the beginning of the analysis process, when a careful reading of the interviews is done, allows for a coding system that more accurately aligns with the intended meanings of the respondents. For example, during the initial analysis of the interviews in Timessagou, the coding process simply captured the number of women engaged in weaving cotton. After a more careful reading of the interviews during the analysis process, it became clear that cotton weaving is heavily tied to women’s nobility status, and therefore identity, within the village. Information related to cotton weaving was then re-coded to better reflect the ties between the activity and identity. Overall, the analysis process involved a number of steps that are summarized below.

1. Establishing the vulnerability context and stratifying the communities

After the codes were refined to better reflect the information in the interviews, the residents’ reported stressors and shocks were extracted and used to establish an overall vulnerability context for each community, as well as map out different assemblages of vulnerability shared by groups of residents within those communities. These were triangulated with existing literature on the prevalent shocks and stressors in this livelihoods zone to identify stressors not mentioned by interviewees, as well as to establish the validity of claims about shocks and stressors in both the literature and the dataset from these communities. This analysis, along

with a review of field notes and a consideration of the initial assemblages of vulnerability reported by the field teams, formed the basis for the final stratification of each community into groups with similar assemblages of vulnerability (See Table 1 and Table 2).

2. Deepening context-specific understandings of identity

To establish an initial understanding of the sociocultural context of the two communities, the HURDL analysis team relied on both grey and academic literature on the Bambara and Dogon. This literature, however, is in many cases dated and often does not speak specifically to identity as it relates to livelihoods activities. Therefore to develop a deeper understanding of the relationship between identity and the roles and responsibilities within the two communities, the analysis team triangulated information from the literature review with data from the interviews and observed behaviors in each village. Interviews at this stage also sought to identify the roles and responsibilities associated with different members of the household and community, and why these roles and responsibilities were associated with these individuals.

3. Exploring discourses of livelihoods

After an identification of which roles and responsibilities are attached to particular individuals, the field team then focused on deepening the understandings of the framings of livelihoods activities. This line of inquiry focused on how residents of each village explained who was responsible for particular activities, how those activities should be undertaken, and why these activities were seen as appropriate/inappropriate, both for the community and for particular individuals. Discourses of livelihoods, when considered in light of the mobilization of identity, explain why observed patterns of livelihoods activities are seen as valid and legitimate by a wide range of community members. In other words, this portion of the analysis allows us to understand how it is that the particular organization of livelihoods within a household or community comes to be seen as taken-for-granted social facts by members of that society.

4. Identifying tools of coercion

Although the ways in which discourses of livelihoods mobilize identity, which in turn speaks to the construction and maintenance of those discourses, helped to explain the organization of livelihoods as well as the universe of possible actions for residents of Timessagou and Diarani, these relationships do not adequately explain the consistency with which residents follow expected patterns of activity. Further explanation was needed as to why, even in circumstances where livelihood strategies produce unequal outcomes within the household or community, these strategies persist. In identifying the tools of coercion existing within the two villages, the field team sought to answer the question of why in unequal circumstances members of the household, concession or minor lineage disadvantaged by existing structures of livelihoods continue to act in a manner that meets expected roles and responsibilities. The team also sought to identify who in particular within the community has the legitimacy to employ which tools of coercion against which other community members, if there was considerable agreement about the context in which they could be employed, as well as whether there were contexts in which tools of coercion could not be applied despite clear transgressions of expected activities or roles and responsibilities.

5. Check analysis against reported sub-group vulnerabilities

The final step in the analysis involved cross checking the structure of decision-making established through the analysis of perceived vulnerability, the mobilization of identity, and tools of coercion against assemblages of vulnerability *within* groups reporting shared assemblages of vulnerability to examine the extent to which this structure explains those intra-group patterns.

The Dataset

The dataset discussed below includes 176 total interviews, 90 in Timessagou and 86 in Diarani. Although collected from the same livelihood zone, the data was not aggregated during the analysis, as there were differences in the contexts of the two villages that produced different assemblages of vulnerability.

HURDL's LIG analysis is qualitative with the aim of identifying and carefully explicating processes and relationships. In this case rigor and validity are not analyzed through the selection and analysis of a random sample. The main aim of a LIG analysis is to identify and carefully explicate the relationships and processes related to livelihoods within a particular context. This behavioral baseline followed well-established procedures for obtaining rigor and validity within qualitative research (See Miles and Huberman [2014] for an extensive description of procedures for establishing rigor and validity in qualitative research). Data collected was context-rich, ensuring that the information in the report represents the ways of thinking of the respondents. Where possible quotes representing the words of respondents themselves are used. The quotes appear in third person to stay true to the fact that we are working from translated interviews, and the interviewers sometimes recorded responses in this manner. The field team endeavored to achieve saturation. Here the goal was to ensure that no new questions or information emerged from interviews such that the interviewers were largely able to predict the content of an individual's answers based on relevant aspects of their identity. During analysis patterns and themes identified in the in-depth interviews were triangulated with observational data, available literature, and/or other available data (such as data from other behavioral baselines conducted in ML09). In the report, converging conclusions from triangulated data are explained and areas of where these conclusions are less certain have been flagged for reader. In addition, in cases where contrary evidence or rival explanations were found these are included in the report. Finally, the findings from the two villages were sent to the field supervisor, and where appropriate to the enumerators, who verified or refuted the findings based on their fieldwork experience in the villages and their extensive knowledge of farming communities in rural Mali.

Some limitations exist in the dataset. Although LIG utilizes purposive sampling to capture a large number of individuals under each vulnerability group, field teams often find it hard to identify those groups precisely while still in the field. Experiences from previous behavioral baselines shows that field teams tend to over- disaggregate vulnerability groups, which the analysis team later consolidates (see Carr et al. 2016, Carr et al. 2015a). This over-disaggregation of data in the field is actually desirable as it allows the field team to sample extensively across the community as possible. In addition, the final groupings of residents with similar assemblages of vulnerabilities are made by carefully comparing the

vulnerabilities of individual respondents to the whole data set, as well as stepping back and triangulating observed patterns with findings from other behavioral baselines and other available data. This is not only a time consuming process and therefore not feasible for the field team to carry out, it is also a process of abstraction of the data, which is a task best carried out during analysis rather than data collection. For both villages, therefore, the initial, field-based groupings of assemblages of vulnerability were consolidated into fewer groups that are presented in this report. The times of the year when interviews are conducted may also limit the availability of certain members of the community depending on when certain livelihood activities are conducted. For example, during the agricultural season it is often difficult to interview junior women, as they are heavily engaged in agricultural work. On the other hand, between agricultural seasons it may be difficult to find junior men, who may migrate to take up seasonal labor elsewhere during this period. As a result, even after the consolidation of vulnerability groups in the analysis phase, in some cases the sample size of a particular group is small, making generalization challenging. However, because the roles and responsibilities associated with particular identities are often broadly applied within a community, it is often possible to triangulate the responses of even a very few individuals in a given group with those in other groups to develop rigorous interpretations of livelihoods decisions.

3. The Behavioral Baselines

This section summarizes the findings of LIG analyses in the two research sites: Timessagou and Diarani. Both are located in ML09.

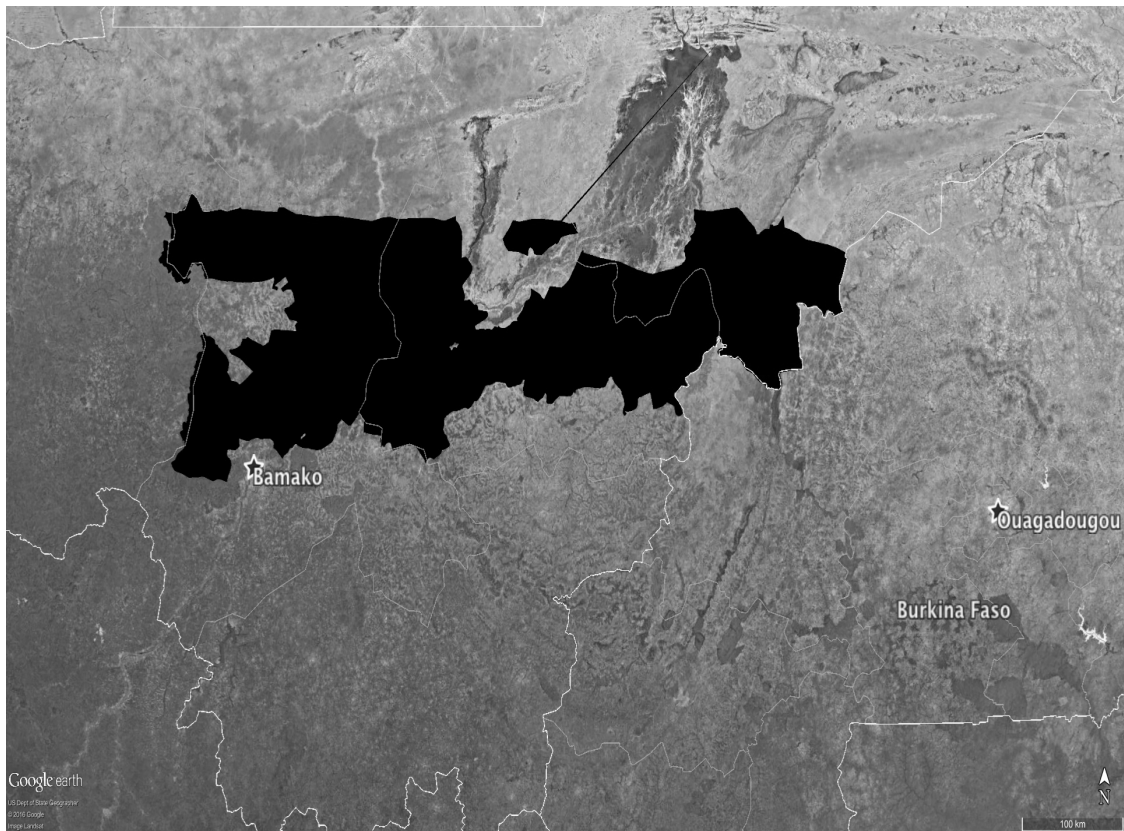


Figure 2: Locator map of ML09

ML09 is a transitional zone linking the more agriculture-dependent zones in the South to the drier, pastoralist-oriented zones in the North. Many residents of ML09 are agriculturalists and engage in animal husbandry. Annual precipitation ranges between 600 and 800 mm, with a majority of the rain falling between June and August (Dixon & Holt, 2010). This precipitation enables the cultivation of millet, sorghum, and a wide variety of legumes (including peanuts, cowpeas, earth peas, black eyed peas, and beans) as major staple crops, with peanuts as dual-purpose (staple and cash) crops. When conditions allow, residents also cultivate maize as a staple. Cotton and sesame constitute the main cash crops in this zone.. For most residents of this zone, agriculture offers a way to meet most of their consumption needs, particularly for grains. Meeting these needs can be challenging, particularly during the hungry period, which lasts from June to September. Wealthier households are better able to withstand this period, as they have the capacity to produce greater surpluses of staple grain and the ability to sell livestock to buy grain when needed. For households with fewer assets, the hungry period presents particular challenges. These households are limited in their ability to produce grain, as they must wait to borrow or rent plows and animal traction from wealthier residents who use them first. They are also more dependent on agricultural labor as a source of income (in comparison to wealthier households whose livelihoods may be more diversified). Since peak demand for farm laborers occurs during the agricultural season (which coincides with the hungry period), the ability of poorer households to work on their own agricultural production is further diminished, as they often first sell their labor to earn money before turning to their own fields. As a result, households with fewer assets are more likely to depend on food loans and grain bought on the market. In addition to the challenges faced in feeding the household for the entire year, Dixon and Holt (2010) also document insufficient rainfall, pests, livestock disease, bush fires and lack of adequate pasture for livestock as major livelihood stressors and shocks in ML09.

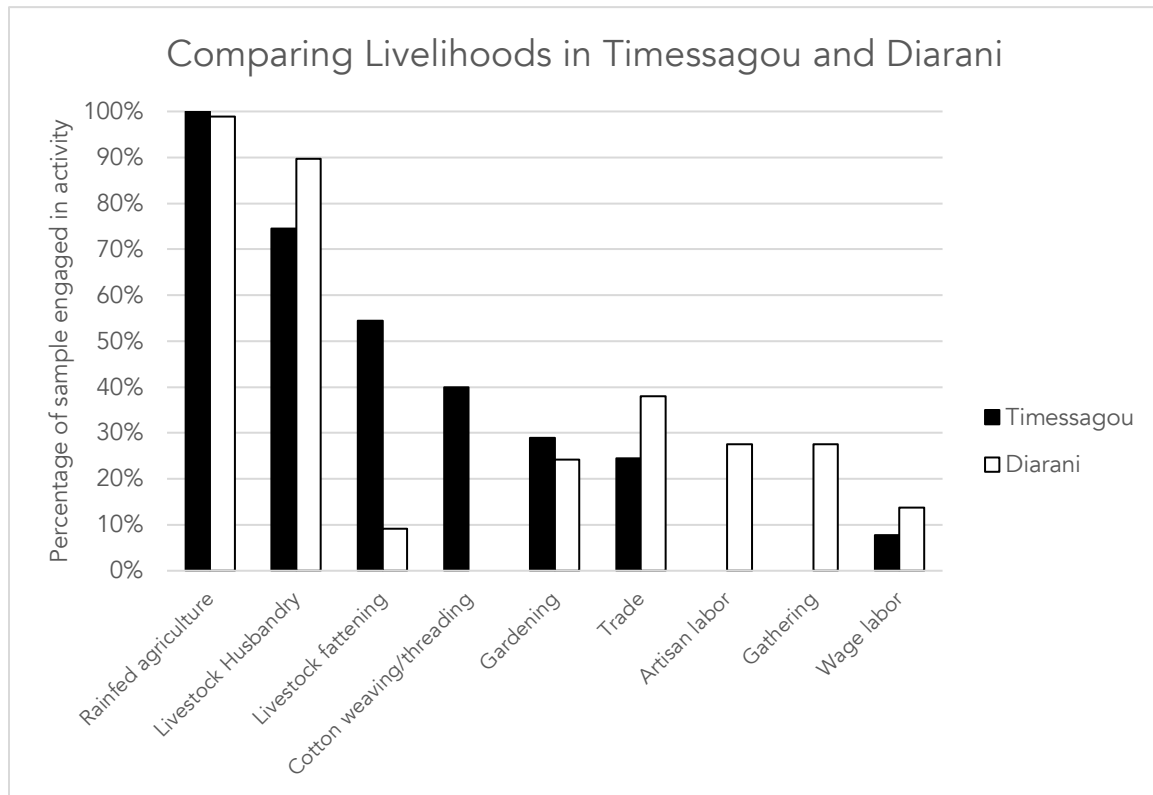


Figure 3

As Figure 3 illustrates, residents of both Timegasso and Diarani principally engage in rainfed agriculture and livestock husbandry, and they engage in gardening, trade, and wage labor at similar rates. In Timegasso, residents engage in the practice of livestock fattening, report women's engagement with cotton weaving and threading (a product of women's caste in this village, discussed below). In Diarani, residents (principally women) engage in gathering, often a marker of hunger and poverty in this livelihoods zone.

These different livelihoods in part reflect different material situations in these villages. A comparison of the percentage of each village sample associated with particular assemblages of vulnerabilities (Figure 4), themselves tied to access to livelihoods assets, makes it clear that Diarani sample has substantially more individuals with high-asset livelihoods than Timegasso. In Timegasso, the bulk of the population has adequate asset livelihoods, though a very significant percentage of those live in precarious situations where they could find themselves in low asset situations relatively easily.

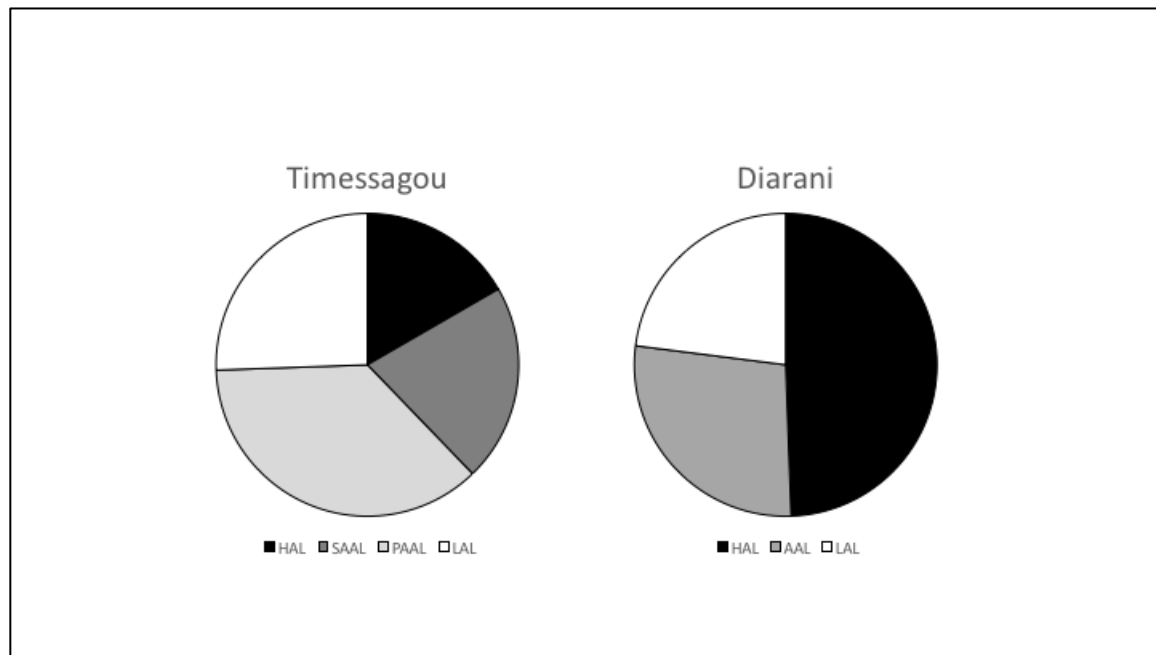


Figure 4: Composition of samples by assemblage of vulnerability in Timessagou and Diarani

Finally, Timessagou is a Dogon village, while Diarani is a Bambara village. These different ethnicities, while having broadly similar structures of authority and livelihoods organization, have some specific differences that play out in different vulnerabilities and opportunities for resilience-building, which are discussed below.

Timessagou Village

Timessagou is located in Koro Cercle of the Mopti region, approximately 14 miles east of Bankass (7398 residents in the 2009 census) and 15 miles west of Koro town (16020 residents in the 2009 census), the two nearest urban centers.

The livelihoods of the residents of Timessagou were broadly representative of those within zone ML09 as observed by Dixon and Holt (2010). Rainfed agriculture and animal husbandry were the most commonly practiced livelihood activities. The most commonly grown staple grains are millet, sorghum and fonio. These crops had a strong association with men's identities and were seen as appropriately grown by men to feed their families. The main cash crops were peanuts and sesame. Women participated in peanut production as an autonomous agricultural activity yielding independent income, but they did so after completing tasks on both the communal fields of their minor lineage and their husband's fields. Although HURDL found that elsewhere in ML09 peanuts were characterized as a woman's crop (Carr et al. 2015), there is no indication that within Timessagou this was the case with both men and women reporting growing the crop.

The HURDL team identified four groups with different assemblages of vulnerabilities in Timessagou. These were, from the least to most vulnerable: High Asset Livelihoods (HAL); Secure Adequate Asset Livelihoods (SAAL); Precarious Adequate Asset Livelihoods

(PAAL), and; Low Asset Livelihoods (LAL). Of the 90 Timessagou residents interviewed, approximately 16.6% belonged to minor lineages and households with High Asset Livelihoods (HAL). These residents had the highest rates of ownership of draft animals, ploughs and other key farming equipment. All of those with HAL owned both a plough and a cart. Eighty percent had ownership of oxen, 33% horses and 33% camels. These animals were used as high value draft animals. Most of the respondents with HAL had access to agricultural transportation, with 87% of these residents reporting ownership of donkeys and 100% reporting ownership of a cart. Those with HAL also had the highest reported ownership of other animal assets as well. The most commonly kept livestock were oxen, sheep, donkeys, goats, and poultry, all reared by more than 50% of HAL residents. 100% HAL respondents reported ownership of sheep, 73% poultry and 53% goats. The ownership of these assets provided those with HAL an advantage in pursuing the core livelihood activities seen as appropriate in this context. All members of this group participated in rainfed agriculture and animal husbandry (100% in animal raising and 67% in animal fattening)². All respondents with HAL cultivated peanuts, millet, cowpea and fonio. Outside of the core livelihood activities, there was little participation among those with HAL in NFE activities. Thirteen percent HAL respondents were engaged in trading activities while less than 10% reported participation in gold panning, migration, woodcutting and religious work. Gardening was found to be a relatively new activity in Timessagou and none of the respondents with HAL engaged in this activity.

Approximately 21% of respondents interviewed belonged to households and minor lineages with Secure Adequate Asset Livelihoods (SAAL). Although these respondents had the necessary assets to provide food for their households, they nonetheless had fewer additional livelihood resources than their counterparts in HAL. In comparison to those with HAL, those with SAAL reported lower rates of draft animal ownership. Fifty eight percent owned oxen, 5% horses and 11% camels. 53% of these respondents owned ploughs while 11% reported that they had access to a plough through other family members. 63% of these respondents owned carts, providing them with access to agricultural transportation. Although owning fewer animal assets than those with HAL, the animal assets of those with SAAL were still substantial. 95% of these respondents owned sheep, 58% goats, 79% poultry and 37% cattle. Overall, as under HAL, these animal assets facilitated the participation of those with SAAL in the primary livelihood activities. All SAAL respondents participated in rainfed agriculture while 95% of those with SAAL participated in livestock raising while 74% participated in animal fattening. The most cultivated crops for respondents with SAAL are peanuts, beans, millet, dah and cowpeas. Apart from peanuts, which were cultivated by all members of this group, the participation of respondents with SAAL in the cultivation of other rainfed crops was slightly lower than those with HAL. Those with SAAL also participated in secondary livelihood activities but similar to HAL there were relatively low rates of participation in these activities. 26% engaged in trade activities. 26% participated in cotton weaving and 11% in gardening. Both of these activities

² In Timessagou as well as Diarani residents distinguish between two types of animal husbandry. Animal raising involves a relatively permanent main herd sold in case of emergencies or major expenses, and animal fattening includes animals not considered part of the main herd. These animals are tethered and fed specifically for the purpose of selling in the short term. The percentage of ownership of various animal species cited in the report reflects both “raised” and fattened livestock.

were gendered with only women participating. Cotton weaving was seen as a prestigious activity. 11% of those with HAL also participate in tailoring and about 5% in cart haulage.

Over 36% of respondents within Timessagou had Precarious Adequate Asset Livelihoods (PAAL). Although these respondents still had an ability to feed their families, their asset base was more tenuous and less secure than those with SAAL. Those with PAAL had significantly lower rates of ownership of agricultural equipment meaning that they must access these resources through family members or through other relatives within the minor lineage. Only 24% of these respondents reported ownership of oxen, 3% ownership of a horse, and 3% ownership of a camel. Only 24% owned a plough. In addition, only 36% of respondents with PAAL owned a cart and 27% owned a donkey, indicating that the majority of those in this group relied on others for transportation needs related to their agricultural activities. The significantly lower asset base for those with PAAL impacted the flexibility with which they could prepare and plant their fields. Those with PAAL had reduced rates of participation, outside of peanuts, in rainfed crop production (even in staple crops such as millet, fonio and sorghum). Farmers in this group simply could not cultivate the same range of crops as in the more asset rich groups, and therefore had to pick and choose which crops to expend their energy and resources. As with farming equipment, those with PAAL had significantly lower rates of ownership of other animal assets than those with SAAL. Seventy-three percent of PAAL respondents participated in livestock raising and 52% in animal fattening. This rate of participation in animal raising is more than 20% less than those with SAAL and HAL. 79% of these respondents owned sheep, 73% poultry, 39% goats, and 12% cattle. Therefore, members of this group not only had lower rates of participation in animal husbandry, they also owned less high value animals than those with HAL and SAAL. 33 % of those with PAAL were engaged in trade with 11% engaged in construction, 5% in cart haulage and 5% in repair work. Women within PAAL have the highest rates of participation of the four vulnerability groups in cotton weaving (approximately 87%) and gardening (approximately 80%).

Approximately 25% of respondents had Low Asset Livelihoods (LAL). The majority of respondents in this group reported either borrowing or renting farming equipment, as they lacked direct access through their households or minor lineages. Only 13% of respondents in this group had ownership of oxen, the only type of draft animal they owned. Additionally only 26% of those with LAL reported ownership of a plough, 35% a cart and 17% a donkey. A major difference between those with PAAL and those with LAL was that the latter must go outside their minor lineage to acquire these resources, and must wait for those in the other three groups to complete their tasks before they can borrow or rent needed animals and equipment for their own cultivation. This lack of assets and access severely limited the capacity of those with LAL to engage in the core activities in this village. Even within agriculture, these respondents had the lowest rates of participation in the cultivation of all staple and cash crops, as even more than those with PAAL they had to focus their efforts on a very limited set of crops. However, those with LAL were not entirely without animal assets. Forty three percent engaged in livestock raising and 35% in animal fattening. 83% of LAL respondents owned sheep, 48% poultry, 30% goats, and 9% cattle. Except for sheep, these rates are lower than seen among the other three vulnerability groups. LAL women's rates of participation in cotton weaving and gardening were also much lower, with about 40% (half of those in PAAL) reporting they were engaged in gardening and 40 % (less than

half of the rates in PAAL) engaged in cotton weaving. Given the centrality of cotton weaving to maintaining status among women in Timessagou, the low rates of participation in the activity is indicative of the limited resources available to women in LAL households and minor lineages.

| Group | Long Name | Animal Ownership | Agricultural Equipment | Nonfarm employment |
|-------|---------------------------------------|--|--|-------------------------------|
| HAL | High Asset Livelihoods | Highest reported rates of draught animals, large animals and small ruminants | Owens plows and other farming equipment | Diverse range of activities |
| SAAL | Secure Adequate Asset Livelihoods | Lower value animal traction, significant ownership of small animals | Some equipment, but not enough. Often have to wait for work to be completed on communal farms before getting access to farming equipment | Some nonfarm activities |
| PAAL | Precarious Adequate Asset Livelihoods | Limited ownership of both lower value animal traction and small animals | Limited equipment. Has to wait for work to be finished on communal fields | Some nonfarm activities |
| LAL | Low Asset Livelihoods | No draught animals | No plow ownership. Has to rent or borrow equipment | Little to no nonfarm activity |

Table 1: Vulnerability Groups in Timessagou

Dogon small-scale subsistence farmers heavily dominate the population of Timessagou. As is expected under Dogon custom, these farmers were organized into households, which, in turn, belong to a minor lineage. Within minor lineages, gender and age were critical considerations in defining people's roles and responsibilities, access to resources and livelihood activities pursued.

The oldest man in the minor lineage controlled access to agricultural land and other key communal farming assets. Senior men were critical decision makers within minor lineages and had a profound impact on the livelihood strategies that could be pursued by other members of this social unit. Although they had the responsibility of setting the livelihood strategy to feed the minor lineage, senior men were not expected to provide the actual labor in the field. Instead, junior men and members of their households, were the key providers of labor for communal agriculture. Their main responsibility in relation to agriculture was to obey decisions made and execute farming strategies defined by senior men. Although junior men obtained land use rights and access to farming equipment through the head of the minor lineage, they did have autonomy over decision making related to their own household livestock and farm fields. Both senior and junior men were responsible for feeding their

households through the provision of rainfed staple grains. They were also expected to generate enough income to pay for major household expenses.

In Timessagou, an additional layer of identity that greatly shaped the activities both junior and senior men were able to carry out: the definition of the village as a noble village. Because of this definition, the provision of food was most appropriately seen as achieved through rainfed agriculture with animal husbandry providing the ability to fill in gaps during lean times. Particular kinds of work outside of agriculture, such as blacksmithing, were strongly defined as inappropriate for noble folk even if they are lucrative and can contribute to the achievement of food security.

Despite the strong senior-junior hierarchy among men in Timessagou, in the course of fieldwork we noted that the importance of the minor lineage is under some stress. The organization of this Dogon community into minor lineages was still the dominant mode of social organization. However, there were indications of alternative arrangements with the emergence of autonomous households not linked to any minor lineage, as well as junior men establishing their own households in the presence of older male relatives. This fits into a larger trend among the Dogon that has been documented elsewhere (De Groote, Duoro-Kpindou and Togo 1997; Van Beek 1993).

For men with HAL:

- 1) On the whole, men with HAL are concerned about rainfed agricultural stressors over which they have little control and that jeopardize their role as the primary providers of food for their families. These concerns are related to the fact that these men already have some degree of stable production but are looking to expand their agricultural production as well as boost their incomes in order to maintain their identity and status. Indeed, their concerns may be more about maintaining social status than material well-being.
- 2) This is particularly true of senior men, who expressed relatively lower rates of concern for food shortages, insufficient draft animals, poor yields, and food shortages. Instead, concerns over degraded soils, insufficient fodder, insufficient farming equipment, and animal disease and death show that these men are concerned about expanding production and maintaining their animal assets.
- 3) For junior men with HAL, concern for food shortages, insufficient rainfall, and insufficient access to fertilizer show the lack of control these men have over the planting and agricultural strategy developed at the minor lineage level (a result of their role as obedient members of the minor lineage), as well as the fact that their household farms are often planted later than communal lands. These men are also concerned about expanding their animal assets to ensure they will be able to achieve status as respected senior men. This is reflected in their concern for animal feed and grazing space.

For men with SAAL

- 1) Both senior and junior men with SAAL are principally concerned with access to productive assets in order to stabilize their production as well as secure their role as food

providers. These men have a somewhat secure material means of production, but are not as secure meeting their responsibilities to feed the household or minor lineage, which is more a threat to their role and identity than their material well-being. That their concerns for access to productive assets is greater than their concern for stressors like rainfall suggests that these men perceive their constrained access to productive assets as the main impediment to improving their production. Unlike their counterparts with HAL, they have not yet reached a level of security where their primary concerns center around stressors beyond their control.

For men with PAAL

1. Similar to their counterparts with SAAL, men with PAAL have concerns both for their status and for material outcomes related to agricultural production. However, under PAAL asset ownership is lower, and agricultural and wider livelihoods outcomes more precarious. In this group, stressors are as much about the material well-being of the individual and household as they are about the identity, roles, and responsibilities of these men.
2. The focus of senior men on stressors such as poor yields, lack of labor, late arrival of rains, and insufficient draft animals highlights the precarious character of agricultural production for men with PAAL. One striking difference between senior men with PAAL and those with SAAL is that the former are concerned with poor yields while no senior men with SAAL report this as a stressor. This may reflect the lack of control those with PAAL have over their means of agricultural production. Their access to the necessary equipment and assets needed to farm is irregular and uneven. Even in cases where they own key assets, these are often not of the optimal quality or are incomplete. For instance, some men with PAAL reported using a donkey instead of larger livestock to plough, while others only owned one ox when two are needed for plowing. This inadequacy of resources significantly slowed and strained the ability of these men to carry out critical agricultural tasks such as clearing land, plowing and sowing. As a result of these challenges, men with PAAL are also concerned about an additional set of stressors, such as lack of labor, that impact their ability to bridge gaps in productive capacity caused by inadequate and irregular access to resources. These men are deeply concerned about their ability to fulfill their role as food providers for their minor lineages. However, they are unlikely to have the capacity to expand their production much beyond current levels. Their decision-making therefore is likely to be geared both towards stabilizing their key agricultural assets as well as stabilizing production in order to fulfill their roles as providers for their families.
3. Given the compromised ability of senior men to provide food, junior men in PAAL minor lineages may bear more responsibility for assuring the food security of their households. Junior men under PAAL report rates of concern over poor yields that are approximately twice as high as those for their counterparts with SAAL. They also have much higher rates of concern regarding the insufficiency of manure (a key agricultural input) as well as poor degraded soils than those with SAAL and HAL. These are concerns over factors that directly impact the ability of these men to

produce grain for their households. Further, concerns over the insufficiency of manure also reflect the limited animal assets available these junior men. Overall, these junior men are more concerned with fulfilling a core aspect of their identity - being able to feed their families - rather than increasing their asset base.

For men with LAL

- 1) These men are severely stressed in their access to key livelihood resources. This is reflected in the fact that approximately a third of these men report not having a plough at all, while a majority report not having enough draft animals. Because of their lack of access to these key assets, men with LAL lack the ability to meet their responsibility to feed the household, let alone address many of the stresses and shocks they face.
- 2) In addition to concerns over access to key agricultural equipment, senior men with LAL also show the highest rates of concern over food shortage reflecting the highly compromised ability of these men to feed their households and minor lineages for the entire year. The decisions of senior men with LAL are likely to be greatly influenced not only by considerations related to environmental stresses, stresses that might impact their limited assets base (such as availability of labor), but also by their need to still maintain their defined roles as food providers for their families. In previous HURDL research, men in households with few assets in turn restricted the participation of women in grain production in an effort to secure and protect their role. As a result these men are limited, both by their limited asset base as well as the need to protect their identity as the providers of food, in the decisions they can make with regard to how to improve their agricultural and livelihood outcomes.
- 3) The participation of junior men with LAL in NFE activities appears to be restricted, with no junior men reporting participation in any NFE activities. Since there are few junior men within this group, it is difficult to draw conclusive statements about this observation. However, this might be an important observation as these men may be consciously choosing to focus on rainfed agricultural production as a way to try and fulfill their role and maintain their social status within the community.

This analysis suggests three critical points about decision-making that have to be considered when addressing these challenges through interventions:

- 1) As a result of the expectations attached their identities, men (and especially noble men) are unlikely to abandon rainfed agriculture as a livelihood activity, even when this activity is unlikely to fulfill the food needs for the minor lineage or household. Livelihood decisions made by men are likely to have, at their core, a desire to protect their role as providers for their families.
- 2) Given the centrality of rainfed agriculture, men are likely to privilege the production of staple rainfed grains (millet and sorghum) over other farming activities, since this production is so closely tied to their roles and identities.

- 3) Cash crop farming (peanuts and sesame) is critical for generating income for household and minor lineages to meet expected needs as well as emergency expenditures. It is important to note that, in terms of men's roles and responsibilities, even successful cash crop production is not a substitute for the subsistence production of grains. This suggests that farmers whose livelihoods are stressed may choose to pull out of cash crop production first before abandoning subsistence production. However, these farmers would be more likely to pull out of sesame production first before peanut production since the latter are also a subsistence crop.

In Dogon society women are caretakers of the domestic sphere, and support the reproduction of their households and minor lineages with respect and obedience. Indeed a central characteristic of women's identity in Timessagou was the ability to listen to, obey, and respect their husbands. Women were expected to carry out most of the domestic tasks as a major part of their responsibilities. They were also expected to support men's agricultural activities, both at the household level and at the minor lineage level, through the provision of their labor. Women's own activities were seen as supplementary to those of men and, as such, women were expected to privilege this provision of labor over their own agricultural production or NFE activities. In addition, independent livelihood activities were suitable only in as far as they did not comprise women's roles as caretakers for their families, their ability to fulfill their duties on communal and household farms, or interfere with men's efforts to fulfill their roles. Women's own livelihood activities were critical, however, allowing them to meet responsibilities associated with the provision of cooking supplies as well as meet their own needs and those of their children such as clothes, cosmetics, and annual women's groups fees (tontines). Women reported some autonomy over decisions related to independent livelihood activities as well as full autonomy over any income from these activities. This autonomy was limited by the fact that men made the final decisions over the use and sale of household animals (even when the animal belonged to a woman) and could restrict access to land and agricultural equipment. Men also had the first rights over the use of important resources including manure and leaf fodder. Given this, the decision making power of women over agricultural assets, land, and animals was severely limited and subsumed under men. Finally, similar to men, the designation of Timessagou as a noble village also circumscribed women's livelihood activities. Cotton weaving was defined as a prestigious livelihood activity and even though it was not particularly profitable, many women in the village still endeavored to participate in the activity because of the ways in which it aligned with their identity.

For women in HAL

No women in Timessagou reported having HAL.

For women in SAAL

- 1) Women with SAAL do not have the same access to resources that men within the same vulnerability group do, a challenge reflected in their concern for lack of access to plows. Instead, they must wait until their husbands and other senior men are finished with this equipment before they can begin their own independent farming activities. However women with SAAL do not express concern over a fundamental inability of men in their minor lineages to provide food. Instead their concerns are related to the ability of these

women to successfully engage in their own production in order to ensure some degree of independent income to fulfill their roles and responsibilities within the household.

Women with SAAL also show high rates of concern over water for domestic uses. This concern aligns with the responsibility women have to carrying out domestic activities.

- 2) In addition to the stresses indicated above, senior women under SAAL, are also concerned with lack of labor, and the high cost of materials for trade and artisan work. Although over their lifetime they may have acquired more secure land tenure (in comparison to junior women) senior women nonetheless still have little control over the labor available within their household or minor lineages. At the same time, these women's ability to participate in the physically demanding activities related to agriculture is diminished because of their age. Given that they are embedded within relatively secure households and minor lineages, labor may be one of the few key impediments to expanding independent farming activities and it is not surprising that this appears as a key concern for senior women under SAAL. Concerns over the high cost of materials for trade and artisan work reflect both cultural pressures and physical realities. As indicated earlier, cotton weaving was central in defining the identity in Timessagou and women sought to engage in the activity regardless of the profitability. Many of the women sighting costs of artisan materials as a stressor are actually articulating pressures they feel to participate in an activity that does not necessarily generate a return on investment. On the other hand, since some artisan activities require less physical labor, because their lack of control over household agricultural labor, and given that there are fewer demands to contribute their own labor to communal farming, artisan activities represent one of the more feasible opportunities for senior women in secure households to earn additional income.
- 3) Although there is one junior woman under SAAL, her concerns over food shortage, insufficient access to manure, and access to farming equipment strongly reflects her social position within the household and minor lineage. Since junior women are embedded in households that are not entirely secure in their food provision, they may face greater pressure to use their own income to buy a greater portion of the household food. This woman's concerns over access to manure and farming equipment are likely connected to the relegation of junior women's activities as supplementary to those of men. Consequently agricultural production activities by junior women most likely receive the necessary resources only after the needs of the minor lineage, the household and senior women have been fulfilled.

For women in PAAL

- 1) Women's with PAAL have significantly more precarious livelihoods than those with SAAL. All women in this vulnerability group reported a lack of a plough as a stressor. Like their counterparts in SAAL, women with PAAL must wait until their husbands and other senior men are finished with agricultural equipment before they can be able to use it for their own purposes. But unlike women in SAAL, access to farming equipment for women in PAAL is even more restricted given the inadequacy of equipment owned by their minor lineages and households. This greatly delays their independent production, and thus the resources they have to meet the domestic needs of the household and their own personal needs.

For women with LAL

- 1) Women with LAL live in households and minor lineages that are severely limited with regard to key livelihood resources. The concerns of these women for food shortages, irregular rainfall and poor yields demonstrate the fundamental inability of their minor lineages and households to provide enough food for their members.
- 2) Women in this vulnerability group also report a lack of remittances as a key stressor. This is an important indication that without monetary assistance from relatives, women in LAL lack the ability to meet their responsibilities or their needs. Indeed, this extends to their households and minor lineages, which have limited capacity to deal with shocks and stresses without outside assistance.

This analysis suggests several critical points about decision-making that have to be considered when addressing these challenges through interventions aimed at increasing resilience and development interventions:

- 1) Interventions which support women's gardening, artisan, and petty trading activities bolster women's ability to meet their contributions to the minor lineage and household without threatening men's identities as the main providers of food. Interventions focusing on these activities therefore offer easy entry points and are likely to be taken up without significant resistance within the community. It is important to note however that although gardening is seen as a positive intervention for women, the shortage of water for this activity is a serious limiting factor for the long-term success of such an intervention within this village.
- 2) Women within stressed households, are unlikely to take on additional rainfed farming, outside of growing peanuts, as this would be a direct challenge to the identity of men within their households and minor lineages. Women within PAAL and LAL households are doubly disadvantaged. Although NFE activities take on greater importance in helping them meet their responsibilities within the household, women's primary responsibility is still seen as the provision of labor for communal farming. There are, therefore, likely to be limitations to the amount of time and effort women can devote to NFE activities regardless of the actual level of agricultural activity within the household and minor lineage.
- 3) Interventions involving livestock raising are more likely to be taken up by senior women who have higher rates of participation across SAAL, PAAL and LAL than junior women. Because fattened animals are tethered in the compound and therefore fall within the domestic sphere where women have more control and also because they are less labor intensive junior women are more likely to participate in animal fattening. While the participation of senior women in animal husbandry is relatively stable across all vulnerability groups, junior women have clearer patterns of decreasing participation as household assets decrease. These patterns of engagement in animal husbandry suggest that while senior women across all vulnerability groups are able to take

advantage of animal raising interventions, junior women in higher asset households are more likely to sustainably benefit from interventions involving animal fattening.

Diarani Village

Diarani is located in the Tominian Cercle of the Segou Region, approximately 45km due east of San and had 68078 residents according to the 2009 census.

Livelihood activities in Diarani were dominated by rainfed agriculture and animal husbandry and are therefore representative of those within ML09. Primary staple crops grown in the village included millet, sorghum and fonio. Rice and maize also formed secondary staple crops that were grown if additional land and resources were available. As in Timessesagou, staple grain production was strongly associated with men and was tied to their identity as the primary food providers. Peanuts and sesame were the dominant cash crops. Peanuts, were the primary cash crop, and all respondents interviewed participated in the cultivation of the crop. Although women in the village participated in the autonomous production of peanuts as a source of income, their participation in this activity was not assured and depended on the availability of land and labor within the household and concession. Other important livelihood activities include trading, artisan and craft activities, gardening, gathering, and wage labor. The rates of participation in these NFE was, on average, higher for residents of Diarani compared to those of Timessagou.

The HURDL team identified three groups with different assemblages of vulnerabilities in Diarani: High Asset Livelihoods (HAL), Adequate Asset Livelihoods (AAL) and Low Asset Livelihoods (LAL). Broadly speaking, these groups reflect varying capacities between respondents to react to shocks and stresses (See Table 2). Although the breakdown of the three vulnerability groups in Diarani fell into the livelihood categories representative of ML09 as broadly outlined by Dixon and Holt (2010), the village is unusual. Of the 86 Diarani residents interviewed, 50% belonged to High Asset Livelihoods (HAL) an unusually high percentage. This may be related to the composition of livelihoods within the community. The field team noted a large number of blacksmithing workshops within the village. Blacksmithing, particularly the manufacture of farming equipment, is a highly lucrative business in rural Mali and provides those who participate in the activity the ability to invest in key livelihood assets. Additionally, the presence of a mill in the village made gathering Shea nuts a lucrative activity for women.

Respondents with HAL had the highest rates of ownership of draft animals, as well as ploughs and other key farming equipment. Sixty three percent of those with HAL owned horses, a high value draft animal. Eighty six percent owned a plow, while an additional 5% had access directly through family members and others. Surprisingly, donkeys, which were a key agricultural transportation asset in Timessagou, appear to be less valuable to the residents of Diarani, as only 35% of those with HAL owned these animals. Those with HAL also had the highest rates of ownership across all categories of other livestock, with 86% reporting ownership of sheep, 74% goats, and 70% poultry. These assets provided those within this vulnerability group the resources needed to engage fully in the core livelihood activities seen as appropriate within this context. All members of this group participated in rainfed agriculture, while about 95% engaged in livestock husbandry. An interesting aspect

of animal husbandry in Diarani is that only those with HAL (19% of this group) had the resources needed to participate in animal fattening. Those with HAL also had the highest rates of engagement with the cultivation of all staple rain fed crops (millet, sorghum and fonio) with approximately 93% of HAL respondents cultivating each of these crops. Further, all those with HAL cultivate peanuts. Of note is that the difference between the engagement rates of those with HAL and other vulnerability groups in the cultivation of rain fed crops was more striking in Diarani than in Timessagou. This suggests that this group not only has the resources to cultivate all or nearly all staple crops (instead of having to choose between them), but also that the gap in resources between this group and the others in Diarani was larger than in Timessagou. Other important livelihood activities of note included gardening and gathering. While gardening has a longer history in Diarani than Timessagou, only one woman belonging to HAL engaged in the activity. Gathering, particularly of Shea nuts, was also an important livelihood activity for women with HAL, as all junior women and half of senior women participating in the activity. This is unusual as gathering in ML09 is typically an activity for those with limited assets. However, as indicated earlier the presence of a mill and market for Shea made this activity particularly lucrative in this village and explains the high rates of participation by women from high asset households in the activity. Under HAL, only men are engaged in artisan labor, primarily blacksmithing.

Approximately 28% of respondents belonged to households and concessions with Adequate Asset Livelihoods (AAL). These respondents had the necessary resources to obtain food and meet major household expenses, but lacked the abundant assets afforded to those with HAL. Ownership of draft animals for those with AAL was much more restricted than for those with HAL. Only 20% of those with AAL owned a horse. Moreover, about 38% of AAL respondents owned a plough, less than half the ownership rates for those with HAL. Half of those in this vulnerability group accessed a plow through family members or others within the village. Only 25% owned carts, an essential component of agricultural transportation. Those residents who belonged to AAL also had lower rates of ownership of additional livestock, with 71% owning goats, 46% poultry, and 29% sheep. Fewer assets than HAL however, meant that some respondents within this group did not participate in animal husbandry. Those with AAL still engaged in core livelihood activities, but limitations in the asset base restricted the extent of their participation. For example, those with AAL cultivated primary staple crops (millet, sorghum and fonio) at about half the rates of their counterparts with HAL, showing that they lacked the resources to cultivate all three and therefore had to choose among them. Interestingly, although rates of gardening were low across all three groups, women in AAL grew the highest number of garden crops in this community. Like their counterparts with HAL, women under AAL participated in gathering. Approximately 63% of junior women and about 56% of senior women participated the activity. Trade and artisan labor also formed an important source of livelihood for women in AAL, with about a third of women in AAL participating in these livelihood activities.

Twenty two percent of respondents, all women, had Low Asset Livelihoods (LAL). These respondents faced severe limitations in accessing farming equipment and other key livelihood resources. Only fourteen percent of senior women in this vulnerability group reported ownership of a draft animal (no junior women reported such ownership) while none of the respondents in this group reported ownership of farming equipment. This is expected considering that within Bambara communities, men typically own farming

equipment. Nonetheless, the lack of agricultural resources by women under LAL is also reflective of conditions within their households and concessions. This is evidenced by the fact that the engagement of respondents with LAL in rainfed agricultural cultivation (a marker of the participation of men in this activity as well) was the lowest across all crops (with the exception of peanuts). Women with LAL had to rely on their husbands to borrow or rent farming equipment, and then had to wait for tasks on household and communal farms to be completed before they could use the equipment themselves. Gardening, trade, and gathering were important livelihood activities for women with LAL. 55% of the respondents with LAL participated in gathering. Approximately 53% of senior women and about 43% of junior women participated in trade, while 57% of senior women and 46% of junior women participated in gardening.

| Group | Long Name | Animal Ownership | Agricultural Equipment | Nonfarm activities |
|-------|----------------------------|---|---|--|
| HAL | High Asset Livelihoods | Highest rates of animal ownership across all livestock categories | Owns plows and other equipment | Highest rates of engagement in primary core livelihood activities (agriculture and animal husbandry) |
| AAL | Adequate Asset Livelihoods | Significant ownership livestock but less than those within HAL | Some equipment, but not enough | Lower rates of engagement in agriculture and animal husbandry than HAL but higher than LAL. Significant rates of engagement in secondary livelihood activities. Higher than HAL but lower than LAL |
| LAL | Low Asset Livelihoods | Lowest rates of animal ownership | No ownership of essential farming equipment | Highest rates of engagement in secondary livelihood activities outside of agriculture and animal husbandry |

Table 2: Vulnerability groups in Diarani

The residents of Diarani were principally Bambara small-scale subsistence farmers. In line with Bambara custom, residents of Diarani were organized into concessions, comprised of several households under the direction of a senior man. As in Timessagou, there were widely held, systematic, and coherent understandings of identity within Diarani that determined which community members had particular roles and responsibilities. In Diarani, a respectable man was defined in part by his ability to feed his family through the rainfed production of staple grains. Men were also expected to generate income, either through the rainfed production of staple grain surpluses, the sale of cash crops, or through the pursuit of other livelihood activities. This income was used to meet men's responsibilities to pay for important expenses for the concession and household including health care, taxes, children's education and food. The oldest man in the concession was expected to make decisions over the allocation and utilization of agricultural land and other key communal farming assets by junior men and women. Their main responsibility was related to making these decisions, which, in turn, determined to a large extent the agricultural strategy for the rest of the concession members. Junior men within the concession obtained land use rights as well as access farming equipment from the concession head. The main role of junior men, like in

Timessagou was to obey the instructions of senior men and avail their labor for communal farming. Although they had limited decision-making responsibilities at the concession level, junior men did have decision-making power over the finances and the farming strategy of their particular households. Unique to Diarani was evidence that the circumscription of livelihood roles by caste and gender is becoming somewhat mutable. This is exemplified by two instances. A noble man indicated that he was free to participate in blacksmithing as long as the activity was profitable for him, while another man indicated that he would be able to participate in pottery. Both of these activities would previously have been seen as highly inappropriate for a noble man (in the case of blacksmithing) and any man (in the case of pottery).

For men in HAL:

- 1) Among senior men with HAL, concerns focus on stressors related to animal husbandry and rainfed agriculture. These men are concerned about the pressures of meeting higher-than-usual expectations for food and income production to maintain and strengthen their status and position within the household, concession and community. In other words, these men have the resources needed to meet their responsibilities to their household and concessions. Their concerns are principally related to maintaining their identity.
- 2) Junior men with HAL are concerned with insufficient fodder and animal illness, reflecting their need to build up an asset base independent of concession assets. These men also report concerns over food insecurity and irregular rainfall at rates greater than senior men. This reflects the fact that while concession farms are sown early in the season, junior men fields are only attended to after work on the concession households is completed.

For men in AAL

- 1) Like senior men in HAL, senior men with AAL are concerned with stressors that have an impact on their ability to fulfill their roles as the providers of food for their families. However, men under AAL have higher rates of concern in relation to poor yields, food insecurity and food shortage, and irregular rainfall. This indicates that these men face significant limitations in trying to meet expectations that they provide food for their households and concessions.
- 2) Junior men with AAL also report stressors related to animal husbandry and rainfed agriculture. As among their counterparts with HAL, these concerns are partly reflective of the desire to build up an asset base while fulfilling their roles and responsibilities. However, junior men in AAL also report unique stressors that reveal the precariousness of their livelihoods. For example, these men are concerned about their access to draught animals, a situation, which makes access to household labor imperative. This, in turn, is related to junior men's concerns with a lack of labor to help offset their challenges obtaining draught animals. At the same time, junior men have limited control over the available labor within their household, as communal farming takes priority. These men are likely to be concerned with protecting a core part of their identity as food providers.

This analysis suggests two critical points about decision-making that have to be considered when addressing these challenges:

- 1) As seen in other ML09 communities (Carr 2016; Carr 2015a), men's subsistence staple grain production is privileged over all other forms of rainfed cultivation, as well as other livelihoods activities. Men, as a result of the expectations attached their identities, are highly unlikely to completely abandon rainfed agriculture as a livelihoods activity since this is the avenue through which they can meet expectations of their identities.
- 2) However, the emerging mutability of livelihood discourses with regard to which livelihoods are appropriate for whom, for example the more acceptable participation of noble men in blacksmithing, may provide a wider range of entry points in improving. This applies to the livelihoods of younger men in particular who are likely to have less rigid views on the suitability of activities outside their own caste. At the same time, however, there is potential to narrow the capacity of men who were born as blacksmiths to participate in the only lucrative activity that they have the skill and legitimacy to engage in.

Similar to women in Timmesagou and in accordance with Bambara custom, women in Diarani accessed land and other agricultural resources through husbands and other male relatives and had very little decision making power over agricultural resources. At the same time, women were expected to provide their labor to concession and family farms and obey decisions made by men within these social units. Obedience and deference was seen as a fundamental part of women's identity in Diarani and they were expected to obey their husband's decisions particularly in relation to farming activities. As in Timessagou, women's autonomous activities were defined as complimentary to household and communal farming activities. Women in Diarani, however, had limited rights to make decisions over their own livelihood activities and the use of income from these activities including animal husbandry activities. This income was critical in helping women meet to women's responsibilities within their households including small household needs, cosmetics, cooking supplies and tontines.

For women with HAL

- 1) The limited number of women with HAL makes it difficult to draw conclusive statements about the decision-making of women in this group. However, we can draw some tentative conclusions from the data by triangulating evidence from discourses of livelihoods, livelihood activities, and the mobilization of identity. For women in this group, the concern with stressors related to business and the availability of NFE jobs likely reflects their need to improve their livelihoods in ways that do not threaten men's identity, while at the same time strengthening their ability to contribute to the domestic sphere.
- 2) Senior women with HAL, in particular, have concerns related to the availability of fodder. This concern likely reflects the fact that these women as members of high asset households and concessions, are able to more easily own and support animals, including animals of higher value such as small ruminants.

For women with AAL:

- 1) Among senior women with AAL, stressors coalesce around concerns related to gardening and gathering. Senior AAL women report a lack of water for gardening, long

distances from gardening plots, a lack of water for gardening, insufficient equipment, and decreasing quantities of Shea nuts. Junior women with AAL report stressors related to gardening and gathering, but have the highest concerns over low profits for artisan and trading activities and access to grazing. This reflects concerns these women have to be able to meet their domestic tasks. In addition, this highlights the importance of NFE activities, which are defined as appropriate for women and which do not threaten men's roles to the livelihoods of women in low asset livelihoods.

For women with LAL

- 1) Among senior women with LAL, stressors and shocks center on rainfed agriculture and gardening. These concerns may reflect the fact that senior women with LAL have more secure tenure over land relative to junior women. As a result, they are more likely to be engaged in their own production, which presents an opportunity to think about longer term investments in land and agriculture. At the same time these women often lack the necessary labor and other resources to engage fully in NFE activities therefore elevating the importance of agricultural and gardening activities in their livelihoods.
- 2) Similar to their counterparts in AAL, junior women with LAL have a wider range of livelihood stressors compared to senior women. Junior women with LAL report concerns with access to seeds, access to equipment, and the viability of trading and artisan activities. Concerns related to agriculture likely reflect that LAL junior women's agricultural activities are the last to be considered, and are therefore more constrained than for every other group within Diarani. Concerns related to trading and artisan activities reflect the centrality of these activities in helping these women meet their responsibilities towards their households in ways that maintain and do not threaten men's identities.

This analysis suggests several critical points about decision-making that have to be considered when addressing these challenges:

- 1) Under difficult circumstances women are likely to choose to engage in rainfed production of staple rain fed crops only to the extent allowed by men within their households and concessions. For women in lower asset households, this participation is likely to be curtailed as men seek to protect their identities. This impact is, however, mitigated for senior women who, because of their more secure tenure can still engage to a large extent in their own production of peanuts.
- 2) Both women with HAL and women with AAL are likely to see animal husbandry, particularly related to small ruminants, as a viable pathway to diversify their livelihoods and build an asset base outside of agriculture where their asset holdings are limited and likely to remain this way. Among women in these two vulnerability groups, however, senior women with HAL are the most likely to benefit from interventions that focus on small ruminants. These women are embedded in high asset households where men are secure in their roles, already likely own significant livestock assets, and are therefore unlikely to be threatened by women's ownership of additional animals.

- 3) For women with AAL and LAL, gathering activities, and to an extent gardening activities are important ways of diversifying their income and livelihoods. Interventions that support these women's gardening and gathering are likely to align with the expectations attached to women's roles. However, it is clear that both these activities are under stress (due to diminishing availability of nuts and lack of water for gardening) and their continued viability as alternatives for women is in question.
- 4) Overall, interventions that aim to increase women's own rain fed production of staple crops are likely to meet resistance from both men and women as they are likely to threaten men's identities.

Conclusions

This report offers several major findings which inform resilience-building efforts, both in ML09 and beyond. These include how to better conduct vulnerability analysis to capture factors that shape the uptake and utility of particular resilience interventions, more constructive framings of vulnerability to inform intervention design and choice, and specific recommendations for the selection and design of interventions targeting the two principle livelihoods activities in this zone, animal husbandry and rainfed agriculture.

Lessons for vulnerability assessment and social analysis in ML09

Vulnerability emerges at the intersection of exposure to various shocks and stresses and people's efforts to fulfill roles and responsibilities attached to their identity and livelihoods activities (Carr et al. 2015). Thus people's engagement in various livelihood activities, what risks they prioritize and which resources they mobilize to reduce these risks are not only informed by a desire to improve or stabilize their material wellbeing but also to meet a wide range of social goals. As has been observed elsewhere, above very low material thresholds, social considerations usually override material goals when the two come into conflict with one another (Carr 2008). For example, although the livelihoods of men in Timessagou are extremely sensitive to fluctuations in precipitation, they are likely to abandon rainfed grain production only under extreme circumstances since the provision of grain is a critical element in defining what it is to be a man in this context. Due to their noble identity, even where there is an opportunity to pursue alternative livelihood activities, these men are highly unlikely to engage in blacksmithing or other activities defined as inappropriate for their caste, even when such activities might increase their incomes. Women in Timessagou, on the other hand, continue to pursue cotton weaving as a way to maintain social status even when this activity is not profitable even if this engagement diverts resources from other productive activities.

These examples demonstrate that the way in which identity shapes the particular sensitivity and adaptive capacity of individuals to particular stresses and shocks. The resultant patterns of livelihoods activity and vulnerability are therefore context-specific. The aim of the LIG analysis utilized in this behavioral baseline was to move away from a priori external assumptions about which social cleavages are relevant in determining livelihoods-related decision making and activities within ML09. After conducting the behavioral baseline and

considering findings from previous studies conducted in this livelihoods zone (Carr et al. 2015; Carr et al. 2014), we suggest the following stratifications for future data collection on vulnerability and livelihoods in Bambara and Dogon populated communities in ML09:

- **For Bambara populated communities, the asset base at the *concession* level remains the critical factor shaping vulnerability and livelihood decision-making.** It is within this social unit that livelihood activities and access to resources are determined. However, special attention should be paid to households that operate independently and are not attached to any concessions, since the dynamics of resource access, particularly for junior women, may differ significantly given the smaller size of these households. At both the concession and independent household level it is important to further disaggregate the population by gender and seniority since these are key determinants of roles and responsibilities that shape individual exposure, sensitivity, and adaptive capacity, and therefore both their current choices regarding livelihoods activities and their likely interest in new interventions. Caste can also play an important role in determining the composition of people's livelihood activities and the degree to which they are locked into particular livelihood pathways.
- **For Dogon communities, the observations outlined above for the Bambara hold, with some specific differences.** Despite evidence that their organization into minor lineages may no longer be as strict and that there is an increase in independent households, the majority of residents within Dogon communities still belong to minor lineages. As such, the minor lineages should still be considered the relevant social unit where data collection on vulnerability and livelihood decision-making should be conducted. However, investigators should understand the extent to which minor lineages have declined in importance in a given community, and adjust their focus to suit the context. As in Bambara communities, independent households should be considered separately since their smaller size may have important implications for decision-making and access to resources, particularly for women. Within minor lineages and independent households, data should be disaggregated further by gender and seniority, as these are important aspects of identity that shape individual roles and responsibilities, and therefore livelihoods activities and access to resources. Caste is also an important consideration in Dogon society and its impact in determining livelihood activities for particular individuals should also be taken into consideration.

Understanding the dynamics of livelihoods decision-making in both Bambara and Dogon communities allows us to better predict and understand which interventions have transformative potential, to change the vulnerability context, and open up or close livelihood pathways for particular groups of people. For example, the existence of a mill in Diarani transformed gathering from primarily a food security activity to an activity with a marketing component. This transformation changed which women engaged in the activity, from primarily those in low asset households to participation in the activity by women from adequate and high asset households. The presence of the mill therefore opened up new livelihood pathways for women in adequate and high asset households. At the same time, the engagement of more people in the activity created enormous pressure on the necessary resources thereby potentially shrinking the livelihood opportunities for poorer women.

The LIG analysis utilized in this behavioral baseline provides a framework for carrying out a contextual examination of who has the ability and authority to make decisions about resource access and livelihood activities, who actually does the work involved in the decision, and the circumstances under which these arrangements are likely to be maintained or changed. As Carr et al. (2015) note, **it is critical that implementers consider whom interventions actually impact, rather than whom the interventions are intended to target.** For instance, interventions intended to assist women should target the particular activities in which women are engaged but at the same time consider the varying degrees of authority over resources that they own. For example, in Diarani women can own small ruminants but men have the first rights to manure and have to be consulted about the sale of these animals. In addition, men also have the first rights of use for peanut fodder from women's own farming. It would be critical for animal husbandry interventions take into account the complex arrangements of authority and control around animals and their products. For example, while women may have control over some products generated by their small ruminants, they may not be able to benefit from manure and cannot take advantage of leaf fodder from their own farming. Moreover, women have limited control over the sale of their animals to cover household needs. An intervention aimed at improving the animal assets of women therefore would have to consider whether fattening (where animals are tethered within the compound, a space where women have more authority over activities and may not have to barter fodder) or pastured/free-range animals are more suitable. Even then women in households with few animals have a higher chance of having their animals sold to meet household needs. Below, we address both the constraints and opportunities facing possible key interventions given the data from the behavioral baseline.

Animal Husbandry

In both Timessagou and Diarani, animal assets are a significant marker of wealth and an important safety net for households, minor lineages and concessions.

- Because their decision making over animal assets is severely limited in both communities, animal husbandry interventions targeted at women should in the short term seek to align with expectations for women's roles and responsibilities.
- Women in higher asset households live in contexts of abundant animal assets that can be used to meet household needs, and therefore they are more likely to sustainably engage in interventions with small ruminants. They already play this role and it does not threaten the status of their relatively wealthy husbands and other men in their families.
- Women in low asset households are likely to reap the most benefits from such interventions. However, their engagement may be more tenuous as their husbands lack significant income and assets, and may therefore feel challenged by women's asset ownership and economic independence resulting from this activity.

Across both behavioral baseline study areas, there were significant concerns for animal health and mortality as well as animal nutrition.

- Interventions which provide information about animal diseases, nutrition, and general improvements in animal husbandry are likely to benefit both men and women

- If the goal of a project or intervention is to change the situation of a particular gender or group within a community, it should be specifically targeted towards the species that are likely to be owned by either men or women respectively. For example, diseases that affect cattle, camels, and horses impact relatively wealthy men. Diseases that impact oxen are likely to concern all men and to an extent women, whereas information on sheep, goats, and poultry is likely to be of interest to all community members regardless of gender, asset level, or other identity markers.
- Even when targeted appropriately, however, the channels through which this information is disseminated need to be considered carefully. This requires understanding who is seen as a legitimate source of information about a given activity, which again requires an understanding of roles, responsibilities, and identities as they relate to that activity.

Rainfed agriculture

Rainfed agriculture in both study areas is highly gendered.

- Interventions predicated on the engagement of women's independent rainfed crop production beyond peanuts, and junior men making independent decisions about agricultural strategy, will be considered violations of established roles and responsibilities.
 - Both are likely to cause acrimony within households/concessions/minor lineages in the short term
 - Both will attract a range of social sanctions, including verbal abuse and physical violence as members of the community discipline transgressors in an effort to make them live up to expectations.
- Interventions which aim to improve rainfed agriculture are likely to be more sustainably engaged by men, and senior men in particular.
- Interventions that provide improved seed are likely to be more sustainably engaged by men, and senior men in particular.
- The provision of seed and information targeted towards the improvement of peanut production is likely to benefit women's independent production.
 - Women's improvement of their own agricultural production has limits. There is a threshold beyond which women's agricultural activities become "visible" to men and are more apt to be appropriated (Carr 2008).
 - Interventions that focus on improving women's rain fed agricultural production in a context where this activity is strongly associated with men should carefully vet proposed activities with women to understand the potential for such appropriation.
- One exception to the patterns of women's engagement in rain fed agriculture involves female-headed households³. Women within these female-headed households have to

³ Here we are referring to households that are headed by women and are tenuously or not at all attached to larger social units. This is in contrast to other female-headed households, such as those headed by senior widows who are still residing within concessions or minor lineages

make decisions about their own production of staple grains. These households tend to be severely asset limited, however, and are in this way constrained in their agricultural production. These households are likely to have rainfed agricultural strategies that are quite different than those seen in households headed by men. For example, they may be forced to consistently plant later in the season because they have to rely on borrowed or rented equipment reducing both their ability to act on information provided at the beginning of the season and narrowing the range of crops and varieties they can plant. The unique needs of these households must be determined in relation to the social context that they are embedded in to allow interventions to meet their specific needs.

Transformative Change in ML 09

Finally, while it is imperative that interventions begin from a place where there is a clear understanding of what is acceptable and possible in the present (Carr 2008), this does not exclude the possibility of interventions that aim for transformative change. Instead such interventions offer a way to fully understand which livelihood pathways are sustainable for which particular community members. By understanding what activities are possible right away, it is possible to identify interventions that create new opportunities for different groups that will be durable because they are seen as socially acceptable. Carefully constructed interventions that fit the local context, while enabling locally-acceptable changes in opportunity for different members of the community, can become the foundations for more transformative change. In the short-to-medium term, a LIG analysis points to the likely pathways along which change will occur as individuals leverage these opportunities in terms of income, roles, and responsibilities from their current positions and context. However, as they leverage these opportunities, the social and material context will change in ways that rapidly become unpredictable. Thus, a durable intervention is one that catalyzes change in a particular context, but cannot determine its ultimate outcome.

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