



RWANDA'S CLIMATE SERVICES FOR AGRICULTURE INITIATIVE AND THE PARTICIPATORY INTEGRATED CLIMATE SERVICES FOR AGRICULTURE: A QUALITATIVE ASSESSMENT OF CIS USERS AND THEIR NEEDS



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Cover Photo: Dense fields in rural Rwanda Credit: Tshibangu Kalala

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Rwanda's Climate Services for Agriculture Initiative and the Participatory Integrated Climate Services for Agriculture: A Qualitative Assessment of CIS Users and their Needs

Learning Agenda for Climate Services in Sub-Saharan Africa

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Executive Summary

A unique problem with the monitoring and evaluation of climate information services (CIS) for agriculture interventions is that CIS have no inherent value of their own. Their usefulness rests on their ability to inform changes to farming practices and activities that farmers are willing and able to make. As a result, the pathways through which the information results in observed outcomes, such as increased yield or the improved resilience of farming systems, are complex and dependent on decisions, factors, and processes beyond the climate information alone. For example, access to and uptake of climate information is mediated by complex and often context-specific interactions between social (such as gendered roles and responsibilities, or trust in the information provided) and economic (such as asset ownership or market prices) factors. These factors create different information needs and capacities to utilize this information within a community or even a household. Access to climate information, therefore, does not guarantee its uptake or use. Even in a context where access may be assured and farmers can overcome barriers to the use of the information, it is difficult to directly attribute the provision of climate information to observed outcomes. These decisions are shaped by other sources of information, incentives and disincentives to utilize climate information, and their connections to wider everyday decisions that rural populations make about their livelihoods. In addition, because they are often bundled with other services or interventions, it is difficult to isolate the effect of CIS on livelihoods.

Therefore, to identify and explain the impact of a given CIS, we must understand the ways in which a given CIS meets the particular needs of specific end users, and the pathways through which this information comes to influence not only decisions related to agriculture, but also broader livelihood decisions. Such information is important for the design of CIS that are more gender-responsive and that reach marginal and vulnerable populations, as it points to the information different people need and the different opportunities individuals and groups have to act on that information. Further, by understanding how climate information intersects with livelihoods decision-making, we can build rigorous interpretations of the role climate information plays in observed changes in the decisions and outcomes among users of a CIS.

There is, however, a gap in the development and testing of methodologies that support such detailed, contextual investigations of the social and economic factors that shape user needs and their ability to utilize weather and climate information at the community and household level. This qualitative study of two villages in Rwanda is one of several studies piloted within the Climate Information Service Research Initiative (CISRI) to improve the evaluation of climate information services (CIS) and their impacts in Africa by testing innovative evaluation methodologies within ongoing programs. In this case, we test the utility of the Livelihoods as Intimate Government (LIG) approach, an ethnographic approach to livelihoods decision-making, for gathering information about these pathways of impact.

This report has three goals:

- 1) **Develop empirical information about the connection between a specific climate service and the livelihoods decision-making of its users.** HURDL worked in two communities where the implementation of the Rwanda Climate Services for Agriculture Initiative (CSAI) included the Participatory Integrated Climate Services for Agriculture (PICSA) program. CSAI delivers historical climate data, downscaled seasonal forecasts, and daily weather information through radio broadcasts and cellphone SMS to rural farming communities. PICSA brings

together agricultural extension staff, sector agronomists, farmer promoters, and farmers to consider the practical implications of seasonal and short-term forecasts for farmers and, consequently, incorporate this information into agricultural planning for the growing season.

- 2) **Provide general lessons from the use of a qualitative tool for the monitoring and evaluation (M&E) of CIS.** Specifically, identify lessons regarding the identification of potential and realized pathways through which CIS might have impact on the lives and livelihoods of their users.
- 3) **Fill knowledge gaps identified in the CISRI learning agendas.** CISRI has compiled learning agendas on the monitoring and evaluation of climate information services¹ and on the identification of CIS users and their needs². These two learning agendas identify gaps in our knowledge around CIS, and seek to organize and prioritize these gaps to guide future research into the design, implementation, and efficacy of CIS. As a third goal, this study responds to some of the gaps raised in these two learning agendas, including lessons regarding social constraints on the use of climate information and how different methods of data collection provide different information about the use of climate information.

Methods and Approach

To achieve these goals, we employed the LIG approach to understand how farmers in two FEWSNET livelihoods zones, Rwanda Livelihood Zone 4 (RL04) and Rwanda Livelihood Zone 12 (RL12), made livelihoods decisions. The two livelihood zones are characterized by different agroecological zones and farming systems. The study was carried out in two communities that were representative of each livelihood zone. In RL04 the study was carried out in Gapfura village while in RL12 the study was carried out in Kabeza village. LIG is a qualitative approach that involves semi-structured interviews and ethnographic observation. The approach goes beyond the description of activities and assets to develop context-specific explanations of the underlying structure of decision-making which then produces observed outcomes. This explanation is critical for the design, monitoring, and evaluation of climate services, as it presents an opportunity to understand how climate information intersects with the decisions of different users.

Findings

Goal 1: Develop empirical information about the connection between a specific climate service and the livelihoods decision-making of its users

Individual need for climate information is shaped by the livelihoods decisions that individual makes, and the basis on which those decisions are made. These *decisions* are closely related to individual roles and responsibilities. We stratified residents of the two communities into different groups marked by shared assemblages of vulnerability, and used LIG to understand important social cleavages and

¹ The learning agenda on monitoring and evaluation of CIS can be accessed at: https://www.climatelinks.org/sites/default/files/asset/document/2017_CVaughan-et-al_EVALUATING%20AGRICULTURAL%20WEATHER%20AND%20CLIMATE%20SERVICES%20IN%20AFRICA.pdf

² The paper on identification of CIS users and their needs can be accessed at: https://www.climatelinks.org/sites/default/files/asset/document/2017_Carr-et-al_Identifying-CIS-Users-and-their-Needs-Sub-Saharan-Africa.pdf

identities within the two communities, and the roles and responsibilities attached to each of the identified social identities, which shaped those vulnerabilities. While there are zone-specific differences in these groups, they broadly represent 1) those living in very food, income, and asset-secure households with high participation in salaried employment, land ownership, and significant animal assets, 2) those who own land and large animals, but have little engagement with non-farm activities, 3) those who own land but do not own large animals or engage in non-farm activities, and 4) those living in food, income, and asset-poor households. We then examined in depth how these assemblages of vulnerability created different livelihood decision-making profiles as different community members endeavored to fulfill the roles and responsibilities attached to their social identities. These profiles, in turn, allowed us to understand where and how CIS might inform particular decisions for specific people.

The information that residents of these two villages used to inform their agricultural decisions varied considerably. In Kabeza, farmers reported the heaviest reliance on personal experience to guide their agricultural decisions, followed by agricultural extension (which included PICSA). These results were quite consistent across groups. Even among the least secure farmers, women reported relatively high rates of engagement with PICSA outreach. This suggests that PICSA efforts are reaching even the poorest women in this zone, but that the information and support it provides are not yet seen as reliable. A similar pattern emerged in Gapfura, where the most commonly-reported source of information for agricultural decisions was other farmers, followed by expert sources such as extension (which again includes PICSA).

By blending our understanding of livelihoods decision-making with information about the current use of CSAI forecasts, this report suggests likely different pathways of change within the two livelihood zones that should be monitored for project impact going forward, and how to interpret observed changes (Section 5.2). For example, evidence suggests that while the most secure individuals and households will likely use climate information to boost yields, less secure households lack the land to expand production and lack the security to facilitate changes in their crop selections, likely reducing the uptake of this information. The most insecure individuals and households will not be able to boost their yields, but might be able to use the information to avoid losses in difficult seasons.

Goal 2: Provide general lessons from the use of a qualitative tool for the monitoring and evaluation of CIS

The use of the LIG approach in this assessment presents several lessons regarding the use of this tool, and other in-depth qualitative approaches to M&E. Broadly, we demonstrate that qualitative approaches to M&E are effective means of understanding the decisions that underlie observed behaviors and outcomes, including those associated with awareness, use and uptake of CIS. This understanding is critical to the identification and formulation of meaningful impact metrics, and the rigorous interpretation of changes in those metrics.

Understanding the connection between CIS and local decision-making starts with the stratification of the user population by context-specific factors. These include vulnerability, assets, livelihoods activities, as well as other important social cleavages such as gender and seniority which create different needs for climate information within communities and even households. As evidenced in our analysis, aggregating data only at the level of the community obscured how community members with different assemblages of vulnerability made different livelihood decisions, pursued different livelihood strategies, and built different livelihoods portfolios as they sought to live up to their roles and

responsibilities. Critically these differences were then reflected in varying needs for and ability to act upon weather and climate information.

Second, identifying impact requires more than the measurement of yields or incomes. The rigorous interpretation of changes in M&E metrics and indicators has to include an understanding of the underlying decisions that produced those changes. Furthermore, central to understanding if and how a CIS works, such interpretation needs to connect decision making, associated changes in activities and practices, and outcomes with particular users. This is particularly critical for CIS, as different groups may use the same information to different ends depending on seasonal condition, household needs at that particular moment (e.g. boosting yields in a good year, while avoiding losses in a challenging year) or to fulfill different roles and responsibilities.

Third, understandings of decision-making associated with one livelihoods zone cannot be applied to other livelihoods zones without empirical justification. CISRI-related work in Senegal does suggest it is possible to build valid understandings of livelihoods decision-making in one livelihood zone through ethnographic or other in-depth qualitative work carried out in a single, representative community. However, as this study demonstrates, there are significant differences in decision-making across the different livelihood zones represented in this study, even when important social cleavages and ethnicities remain similar. Therefore, assessments of CIS that are aimed at users across multiple livelihood zones will require zone-specific efforts to understand livelihoods decision-making, and therefore the different users of CIS and their needs.

Goal 3: Fill Knowledge Gaps Identified in the CISRI Learning Agendas

The report provides preliminary evidence for some of the questions that emerged from the two CISRI learning agendas: One on the monitoring and evaluation of climate information services and one on the identification of CIS users and their needs:

- a) *Over what spatial region or social groupings can a particular CIS be scaled? What factors affect that?*

This report identifies important differences in behavior and decision-making across livelihoods zones. This suggests that climate information is not likely to have the same utility or uptake across livelihoods zones without a degree of zone-specific tailoring.

- b) *What are the broad lessons we might learn about the social constraints to the use of climate information?*

The LIG analysis in this report identifies a range of social constraints in the use of climate information, such as the ways in which formal employment constrains the amount of time women have to work on their fields, and therefore shapes particular stresses related to their engagement in agriculture. The analysis above also explains why these women are likely to continue to privilege their off-farm labor, even when forecasts are accurate and seasonal conditions are supportive of agriculture.

- c) *What are the differences in information gleaned through different methods, and how might different approaches be integrated to draw on strengths and eliminate gaps? What are the most effective means of learning about users and needs in a given place?*

While this study is purely qualitative, and largely ethnographic in its approach, it serves to highlight the sorts of information that such work can provide to our understanding of CIS users and needs.

The ethnographic information in this report explains patterns of behavior in great depth. This information can be used to nuance, augment and expand on information generated through other methodologies, such as surveys.

d) *How do we identify and potentially measure a broader range of impacts than yield alone?*

For example, in zone RL12, the program is reaching women in resource-poor households but not men in the same households. Given that men still make final decisions about the use of land, but are more subsistence-oriented in their production than women (see discussion on LRL crop utilization in Kabeza in this report), women's use of weather and climate information must negotiate access to land via individuals who do not share their desired agricultural outcomes.

Summary

Taking a detailed, qualitative approach to the livelihoods of prospective climate service users serves to better understand who these users are, what their needs are, and how CIS can meet some of these needs. In-depth qualitative approaches such as LIG are powerful tools for identifying the pathways through which a CIS might sustainably address user needs. This information facilitates the design of impact assessments that measure relevant indicators of impact and whose interpretations are informed by empirical evidence. In this way, such qualitative methodologies are essential for designing and augmenting quantitative assessments of CIS, as they speak to what should be measured, and how measured changes should be interpreted.

1 Introduction

This study, conducted by the Humanitarian Response and Development Lab (HURDL), is one of several piloted within the Climate Information Service Research Initiative (CISRI) to improve the evaluation of climate services. This qualitative study of Livelihood Zone 12 and Livelihood Zone 04 in Rwanda assesses the Rwanda Climate Services for Agriculture Initiative (CSAI), a four-year program initiated in 2016 by the government of Rwanda (GoR) with the support of the U.S. Agency for International Development's Rwanda Mission (USAID/Rwanda) and coordinated by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). CSAI disseminates climate information and provides advisory services to farmers in all 30 of Rwanda's districts with the goal of helping rural communities manage climate related risks and improving their adaptive capacities for changing precipitation and temperature patterns. Historical climate data, downscaled seasonal forecasts, and daily weather information are disseminated through radio broadcasts and cellphone SMS to rural farming communities. Within particular districts CSAI includes the Participatory Integrated Climate Services for Agriculture (PICSA) program to circulate information and associated advisories. PICSA relies on an existing extension system within the country, including agricultural extension staff, sector agronomists, farmer promoters (part of an existing farmer-to-farmer extension-network called *Twigiri Mubinzuzi*) and farmers themselves. Working together, these stakeholders consider the practical implications of the seasonal and short-term forecasts for different farmers' plans and choose the crops and livestock best suited to expected conditions. PICSA is expected to reach over a million farmers across Rwanda by 2019 (the end of the project). This study was conducted in communities that have undergone PICSA training.

The aim of this study is twofold. First, it furthers our understanding of the uptake and potential impact of CIS information by understanding how it fits into the underlying logic of livelihoods for those residing in Kabeza and Gapfura villages (Livelihood 12 and 04 respectively). The goal of the analysis presented in this report is to capture the roles and responsibilities played by various members of a community and to explain why members of the community seek to fulfill their roles and responsibilities in particular ways. By building this understanding, this report establishes a behavioral baseline for this zone, providing insights into how different community members currently experience, prioritize, perceive and make decisions in relation to the vulnerabilities associated with their livelihoods. This provides a baseline against which to measure future logics of livelihoods to understand how CIS interventions have an impact not only on material aspects of people's livelihoods but also on the logic of those livelihoods. Second, it provides a qualitative dataset that will be synthesized with survey data collected by CISRI partners as part of an assessment of PICSA's uptake and use in Rwanda. The synthesis of qualitative and quantitative data will enable a meaningful assessment of PICSA engagement and uptake, a critical first step toward the evaluation of the wider livelihoods impacts of this project. Specifically, this synthetic effort is aimed at addressing survey methodology limitations with regard to the internal validity of data interpretation, and the limitations of ethnographic methods with regard to external validity.

2 Methodology

HURDL employs the Livelihoods as Intimate Government (LIG) approach as the conceptual framework ordering its field methods and analysis (Carr, 2013, 2014). LIG is a means of understanding the decisions behind observed livelihoods decisions and outcomes. It views

livelihoods as ways of living in particular places - not merely the activities pursued by individuals. Decisions people make to engage in various livelihood strategies are efforts to govern their world by reconciling social, material and cultural contexts so as to achieve various, often shifting goals. For instance, a HURDL livelihoods study in a southern Malian livelihood zone (Carr et al. 2016) found that men grew millet because the crop is suited to local agroecological conditions. However, growing enough millet to feed the household for the entire year (instead of acquiring it through the market) was also a social marker of a man's success as the head of household. Thus, men faced both social and cultural pressures to grow the crop and would be likely to keep growing it even in unsuitable conditions. LIG therefore illuminates the role a wide range of stressors, including economic, environmental and social stressors, as well as social roles and responsibilities, play in influencing and prioritizing the goals people pursue and the strategies used for achieving those goals.

At its broadest, LIG sees these decisions as taking shape at the intersection of three domains of everyday life: discourses of livelihoods, mobilization of identity, and tools of coercion (see Figure 2.1). *Discourses of livelihoods* are the ways people talk about and understand how they should live in a particular place, especially as related to what activities they should undertake, to what ends those activities should be directed, and who should be undertaking them. Insofar as discourses of livelihoods reference who should be doing what, they mobilize particular aspects of individual *identity*, elevating particular roles and responsibilities that shape how people see themselves, and how they understand appropriate ways of living in that place. In pursuing different livelihood activities, existing discourses of livelihoods and framings of the roles and responsibilities associated with particular identities are reinforced and reproduced. However, livelihood strategies produce inequitable outcomes for community and household members and can lead to frustration and discord. Those disadvantaged by existing ways of living in their households and communities are likely to challenge existing livelihood logics as they seek to improve their positions. Additionally, the physical, environmental and social contexts in which people are embedded are complex and change, challenging the legitimacy of livelihood logics as the context exceeds their utility (for instance, as during a period reduced rainfall that calls discourses of agricultural practice, and the roles of individuals in that activity, into question). Therefore, it is important to understand how communities manage potential deviations from expected roles and responsibilities by employing various *tools of coercion*, locally legitimate means of disciplining transgressions of local expectations or rewarding those who conform to expected roles and responsibilities (Carr 2013; 2014). As individuals strive to meet their roles and responsibilities in everyday life, these three conceptual areas intersect in myriad ways to create and reinforce locally-specific 'social facts' which define, bound and set possible courses of action, and consequently observed livelihood outcomes (Carr et al. 2016).

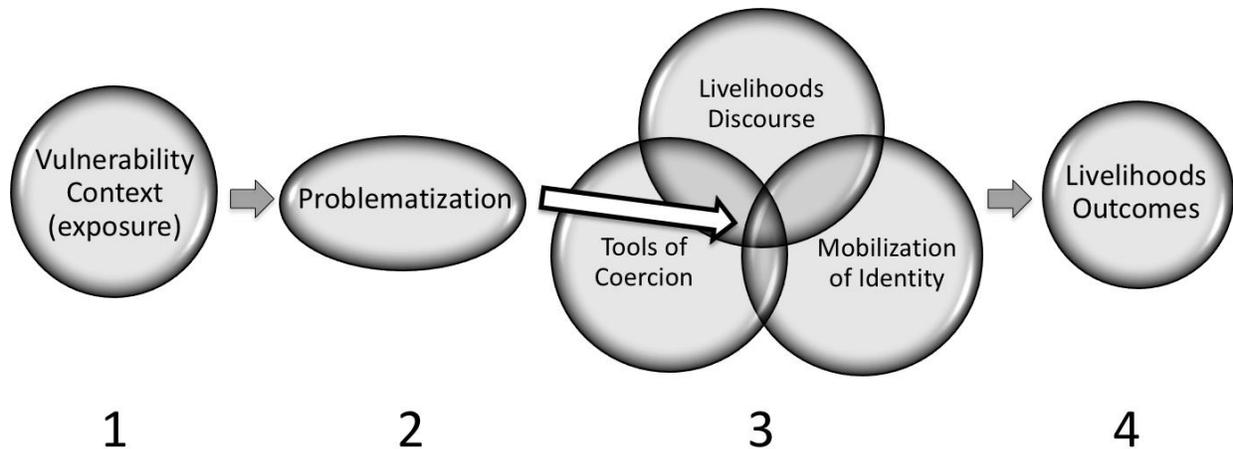


Figure 2.1: Conceptual diagram of the LIG approach (Carr 2014).

Figure 2.1 outlines LIG as a process. It begins with by (1) identifying current stressors to well-being and livelihoods (the vulnerability context). Inquiry then proceeds to (2) moments where some or all members of a community identify particular events or processes as problems, identifying who defines these as problems and why, while also examining how disagreements over the character of an event or process within a household or community can produce pressure on livelihoods (problematization). This, in turn, provides a point of entry (3) into understanding how livelihoods decision making emerges at the intersection of the mobilization of identity, livelihoods discourses and tools of coercion and forms the basis for interpreting livelihoods strategies and outcomes (4) (Carr 2014).

2.1 Criteria for site selection

The study was carried out between July and September 2017 in Kabeza and Gapfura villages (Figure 2.2). Kabeza is located in Kabare sector, Kayonza district, Eastern Province of Rwanda. Kabeza is located near Kayonza town, approximately 92 kilometers (57 miles) east of Kigali, the capital city. Gapfura is located in Hindiro sector, Ngororero district, Western Province. It is located near Ngororero town which is approximately 99 kilometers (61.5 miles) west of Kigali. The two study sites were selected to represent communities where PICSA has been implemented with farmers. The two communities were also selected because the livelihood activities and socio-economic composition of the population were broadly representative of those seen across the larger livelihoods zone to which they belong. Finally, the explanation of PICSA uptake across two distinct livelihood zones was intended to illuminate the different ways in which PICSA connected with local livelihoods across Rwanda, and how those different connections shaped its uptake and use.

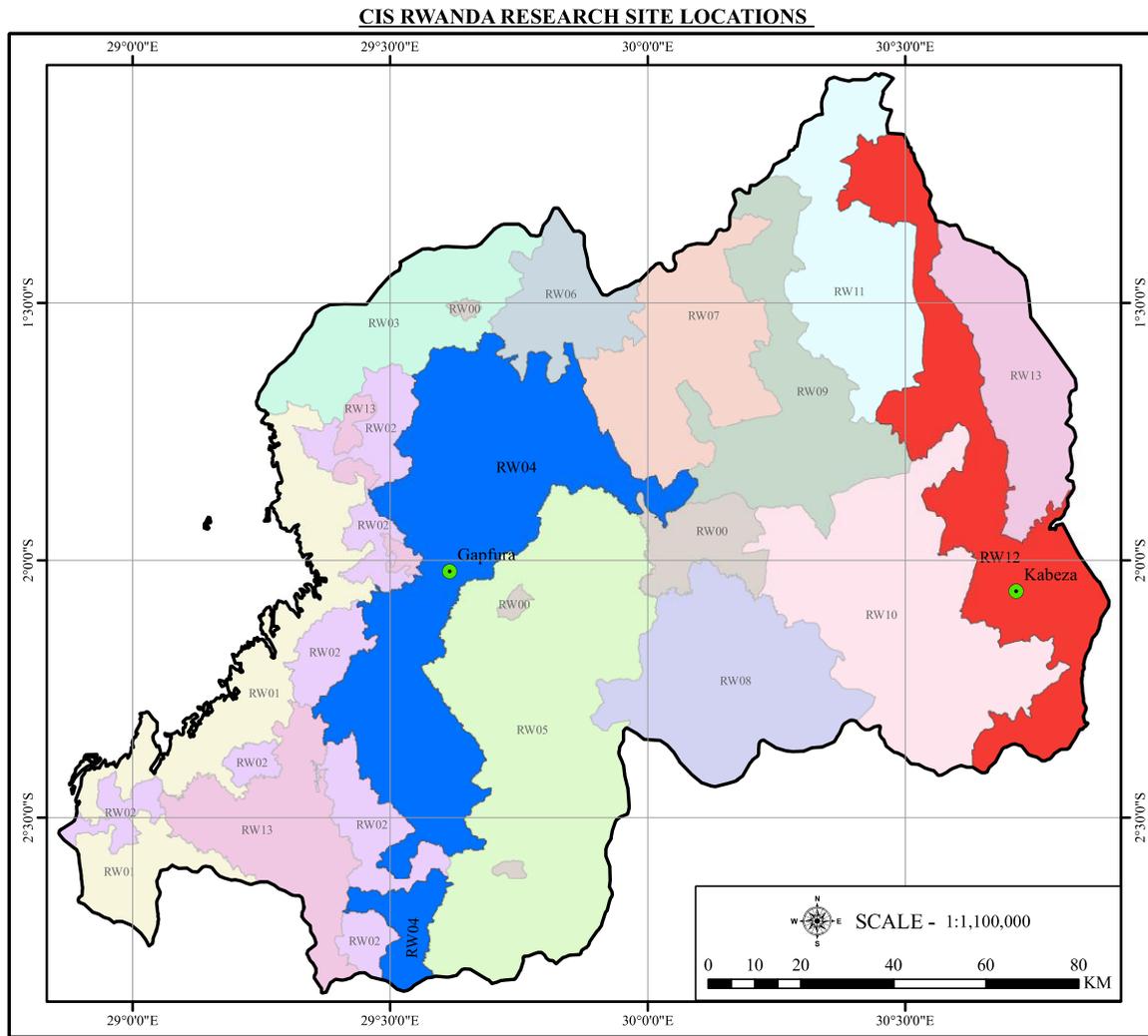


Figure 2.2: Locator map of Zones RW04 and RW12 in Rwanda, along with the communities in which HURDL worked.

2.2 Data collection

Following the LIG approach, we collected data in two phases. Both phases used individual in-depth qualitative interviews and participant observation conducted by the field team. The first phase of data collection was conducted over a period of three weeks between July and August 2017. The second phase of data collection occurred over a period of 4 weeks between August and September 2017. In total, 175 interviews were conducted in both communities: 87 individuals in Kabeza (44 women and 43 men) and 88 individuals in Gapfura (50 women and 38 men). The particular compositions of the households interviewed varied. In Kabeza, we interviewed 11 female-headed households (3 divorced women, 3 never-married women and 5 widows) and two single male headed households (one divorced man and one widower). The remaining 74 households were male/dual headed households. In Gapfura, we interviewed 15 female-headed households (five divorced women and 10 widows) and three single male-headed households. The remaining 73 households were

male/dual headed households. During the first phase of data collection, the field teams focused on eliciting an overview of stressors and shocks people face, their livelihood activities, and why they undertook these livelihood activities. In the second phase of data collection the team sought to understand which roles and responsibilities are associated with particular community members, how community members are expected to meet these responsibilities, and the consequences faced by those who do not live up to their roles and responsibilities.

2.3 Data Analysis

Under LIG, communities are stratified by the assemblages of vulnerability reported by their residents. Though they may live in the same place, and participate in broadly similar livelihoods activities, different community members have different exposures to shocks and stressors, sensitivity to these stresses and shocks, and adaptive capacities to address their challenges. Within communities, groups of people share assemblages of vulnerability - similar experiences of the vulnerability context and similar access to resources that can be used to address stressors and shocks. The groups that coalesce around these assemblages (vulnerability groups) are the primary analytic units for LIG.

The LIG analysis undertaken for this project involved a number of steps as summarized below.

2.3.1 Coding

The field team employed a qualitative interview guide to structure conversations with community members. These conversations were recorded in handwritten interviews which were then sent back to the HURDL analysis team. The interviews were transcribed and entered into a qualitative data analysis software, MAXQDA. The LIG approach was then used to guide the coding process and to develop critical themes for analysis. The coding team generated 20,363 coded segments of text for analysis in this effort.

2.3.2 Establishing the nature livelihood decision making

After the codes were cleaned and refined, data was analyzed for themes and insights related to the logic of livelihoods in the two communities of study as described in the following steps.

2.3.2.1 *Establishing the vulnerability context*

The first step in data analysis involved the identification of respondents' stressors and shocks, and livelihood activities (the overall vulnerability context). This information was triangulated across interviews and with existing literature to establish the validity of claims about shocks and stressors. This, along with a review of field notes and a consideration of initial groupings from the field team, enabled us to define the final assemblages of vulnerability groupings used in this report (see Table 3.1 and Table 4.1).

2.3.2.2 *Deepening context-specific understandings of identity*

A second step in analysis involved an exploration of social identities as defined within the communities and the associated roles and responsibilities. During this stage of analysis, we sought to explain how and why particular roles and responsibilities were attached to particular people within the household and community. We relied on data from interviews and observational notes gathered from each village.

2.3.2.3 Exploring discourses of livelihoods

To uncover how residents believed they should live in their communities, we explored how they perceived and characterized the livelihood activities in which they were engaged, and why these activities were seen as desirable, appropriate, or inappropriate.

2.3.2.4 Identifying tools of coercion

At this stage of the analysis, we examined which individuals within the community had the legitimacy to discipline or reward other community members for their actions and the various ways this was carried out. Further, the team sought to understand if there was considerable agreement about these tools and their appropriate use, and to identify contexts in which they were not applied despite clear transgressions of expected roles and responsibilities.

2.3.2.5 Checking analysis against reported sub-group vulnerabilities and explaining the character of engagement with CIS

The last step in analysis applied the logic of livelihoods identified through the analysis above to the different assemblages of vulnerability identified in the first step. This allowed the team to check the analytic value of the analysis by establishing the extent to which it explained why different people prioritized different stressors in the community. Further, in understanding who prioritized what stressors and why, this allowed the team to identify the ways in which different community members can use CIS.

3 Findings: Kabeza Village, Livelihood Zone 12 (Eastern Semi-Arid Agro-Pastoral)

According to the FEWSNET livelihoods zone descriptions for Rwanda (Brown, Lecumberri and Mutunga 2012). Kabeza is within Rwanda Livelihood Zone 12-Rwanda Eastern Semi-Arid Agro-Pastoral Zone (RL12). RL12 averages 900mm of rainfall annually, less than other livelihood zones in Rwanda, but has clay-based, moderately fertile soils. Agriculture is the main livelihood activity. The precipitation range and soil conditions allow for the cultivation of a wide range of banana varieties, as well as beans, maize, and cassava. Most households engage in animal husbandry, though poorer residents are more likely to raise poultry and goats. Wealthier households possess the resources to raise cattle in addition to smaller livestock. Access to larger agricultural and livestock markets is enabled by the close proximity of national roads connecting the zone to Kigali and other urban centers, and trade is particularly important for wealthier households. Those in poorer households migrate to take advantage of seasonal labor opportunities in construction or mining between May and July, and again between November and December. Brown, Lecumberri, and Mutunga (2012) document drought, flooding and animal diseases as the major livelihood stressors facing this zone. Other stressors include high levels of landlessness and land fragmentation resulting from the small arable land base relative to a fast-growing agriculture dependent population (Lastarria-Cornhiel 2005).

3.1 Kabeza: Vulnerability Context

Figure 3.1 represents the stressors and shocks reported by the 87 residents of Kabeza village interviewed in the study. These stressors are consistent with the vulnerability context described above. Concerns related to the aridity of the environment (drought/insufficient rain, long dry season and water shortage), limited farmland (including having to rent farmland, the use of marshland by

private investors, and lack of access to land) and stressors restricting agricultural productivity (crop disease and pests, limited access to agricultural inputs, shortage of household labor due to widowhood, separation or age) are central to the vulnerability context in Kabeza. Other major livelihood stressors included crop diseases, crop pests, and human illness.

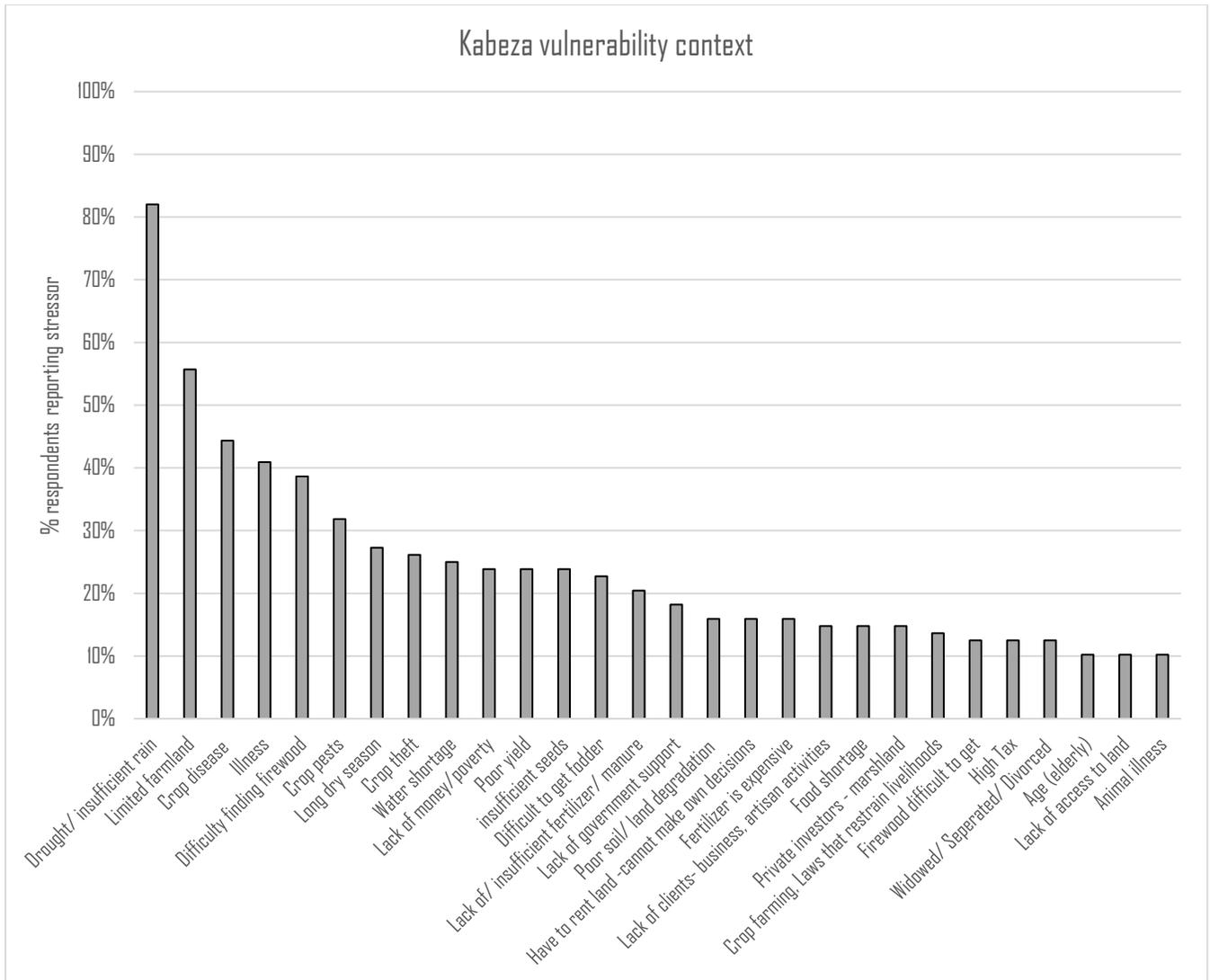


Figure 3.1: Livelihood concerns mentioned by ten percent or more of respondents in Kabeza (n=87)

An analysis of stressors and shocks at the broad level obscures important differences in experiences of the vulnerability context within the community. For example, the second most commonly reported stressor, limited farmland, was reported by 56% of those interviewed. While this is an important stressor in the community, a very substantial portion of the community did not report experiencing this stressor. This suggests that there is important variability in the perception, experience and prioritization of various aspects of the vulnerability context within the community.

During data collection, the field team suggested that respondents be clustered into nine groups characterized by distinct assemblages of vulnerability groups. After careful consideration during the analysis phase, HURDL determined that the nine groups over-stratified the community and

artificially separated individuals with effectively similar assemblages of vulnerability. The nine groups were consolidated into four groups. The rest of the analysis presented in this report uses these four groups to stratify the Kabeza sample (see Table 3.1 below). These are: Stable Income Livelihoods (SIL); Adequate Resource Livelihoods (ARL); Adequate Resource Livelihoods – no livestock (ARL-no livestock), and; Low Resource Livelihoods (LRL). These groups represent increasing vulnerability to livelihood stressors and shocks, and capture the situation of members of a household. Therefore, when someone is said to have SIL, they live in a household that owns large ruminants and land.

Group	Long Name	Animal Ownership	Agricultural Production	Nonfarm employment/ income
SIL	Stable Income Livelihoods	<ul style="list-style-type: none"> - Likely to own large ruminants (cattle) for milk and for sale in case of emergencies - Likely to consistently produce smaller livestock (rabbits/ chickens/ goats) for sale 	<ul style="list-style-type: none"> - Likely to own land - Likely to produce a wider variety of crops - Land ownership allows for production of perennial crops, bananas in particular 	<ul style="list-style-type: none"> - Stable income from salaried positions, trade or agriculture-based activities such as sale of timber from wood lots, or land leasing
ARL	Adequate Resource Livelihoods	<ul style="list-style-type: none"> - May own one large ruminant (cattle) for milk and for sale in case of extreme emergencies - Likely to own smaller livestock (rabbits/ chickens) for sale to cover emergencies 	<ul style="list-style-type: none"> - Likely to own land - Land ownership allows for production of perennial crops 	<ul style="list-style-type: none"> - Likely to have off-farm income but inconsistently from trade or artisan activities
ARL- no Livestock	Adequate Resource Livelihoods- no livestock	<ul style="list-style-type: none"> - No animal ownership 	<ul style="list-style-type: none"> - Likely to own land - Land ownership allows for production of perennial crops 	<ul style="list-style-type: none"> - Likely to have off-farm income, but inconsistently, from trade or artisan activities
LRL	Low Resource Livelihoods	<ul style="list-style-type: none"> - Likely to own smaller livestock (rabbits/ chickens) for sale to cover emergencies 	<ul style="list-style-type: none"> - Likely not to own land and likely to rent land for production of staples - Only likely to grow annual staples 	<ul style="list-style-type: none"> - Off-farm income most likely acquired through daily wage labor activities such as working on others' farms

Table 3.1: Vulnerability groups in Kabeza

Figure 3.2 compares the different stressors and shocks for the four groups. Drought/insufficient rain remains the most commonly mentioned concern across all vulnerability groups. Respondents with SIL reported lower rates of concern over drought/insufficient rain than those with ARL and ARL-no livestock. SIL respondents had the lowest rates of concern for difficulties in finding firewood, as they were likely to have ownership of wood lots or cash available to purchase fuelwood. They also had the lowest rates of concern for illness. Those with ARL and ARL-no livestock had the highest rates of concern over drought, limited farmland, and crop disease. The expense of buying fertilizer was also of particular concern for respondents from ARL-no livestock as they lack access to manure and are therefore more dependent on chemical fertilizer to improve agricultural production. Respondents in LRL households have the highest rates of concern with stressors that influence household labor (including being widowed divorced and elderly). LRL respondents were also concerned with lack of access to land for farming (including having to rent land and no access to land). While LRL, ARL, and ARL-no livestock households expressed concerns over access to land, LRL respondents were expressing a concern for the *lack* of access to land, while ARL/ARL-no livestock respondents principally complained about *limited* farmland. Where a concern for limited

farmland reflected a desire to expand existing production, LRL concerns reflect a lack of fundamental resources needed to engage in important livelihood activities, that are necessary to secure their well-being, and eventually improve their status. These are very different situations.

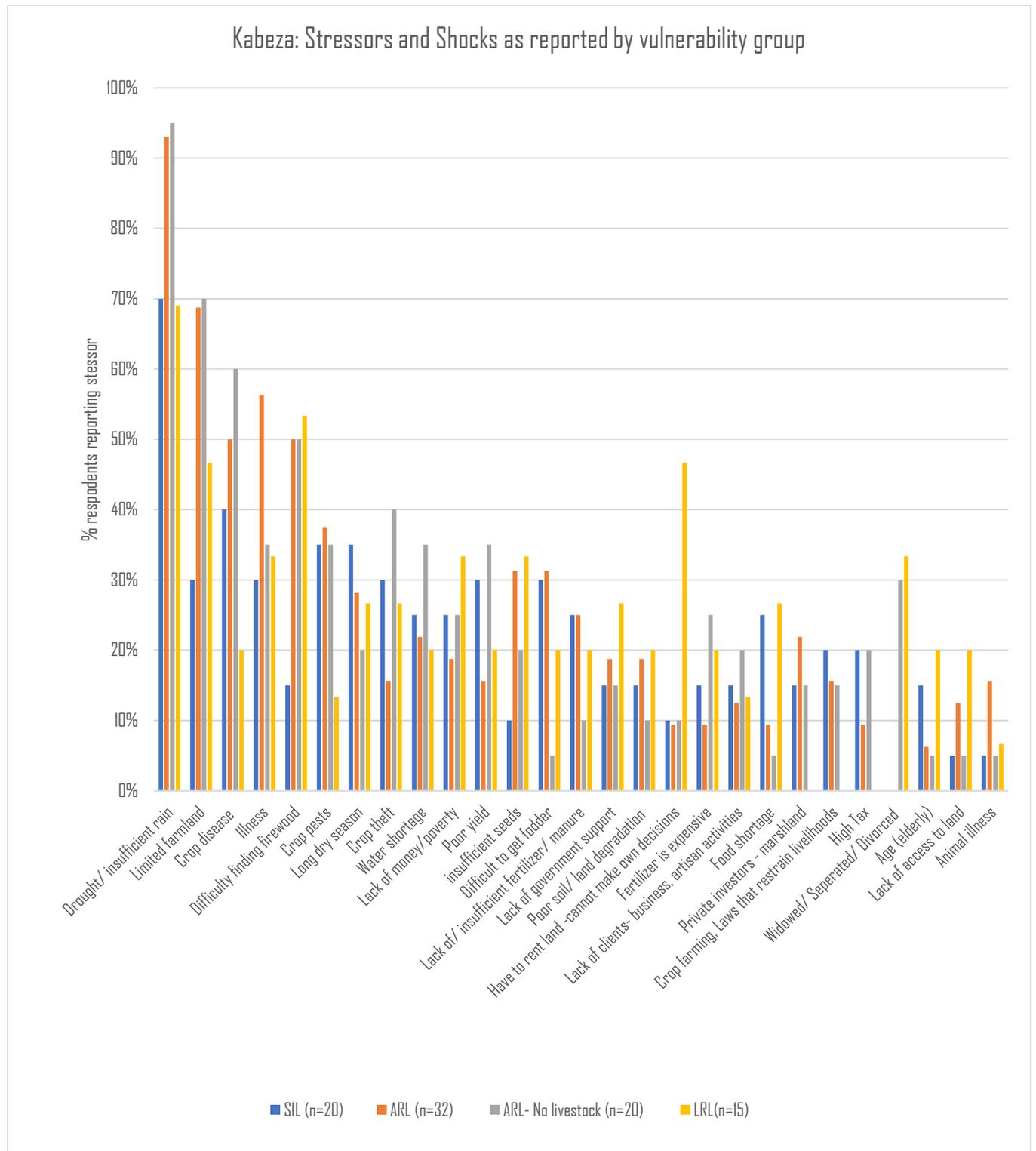


Figure 3.2: Assemblages of vulnerability associated with members of four vulnerability groups in Kabeza

The division of respondents in Kabeza by assemblages of vulnerability demonstrates that while residents are embedded within the same physical and social environment and are exposed to similar stresses, they nonetheless experience livelihood stresses and shocks differently. Some of this variability, as shown above, can be explained as a function of the fact that members of different vulnerability groups have different levels of access to livelihoods assets and resources. However, assets and access to resources do not sufficiently explain the observed differences in the vulnerability context. For example, all respondents were engaged in rain-fed agriculture as a core livelihood activity, but different groups report different rates of concern for irregular or insufficient precipitation, crop disease, and poor yields. However, if we are to design effective CIS we have to understand the sources of these variations in experiences and perceptions of the vulnerability context. Previous HURDL studies in Mali, Senegal, Zambia, and Ghana show that we can explain much of this variation through a consideration of the intersection of these asset situations with the different identities of those in each vulnerability group. Therefore, roles and responsibilities, while consistently attached to particular identities across community members in Kabeza, play out differently in the context of varying access to livelihoods assets and resources. As a consequence, the ability to acquire and effectively use climate information in livelihood decisions will vary for different individuals in different vulnerability groups.

3.2 Identity, roles and responsibilities in Kabeza

The household is the most important social unit in Kabeza. Production, consumption, and reproduction decisions are made at the level of the household. Heading the household is the most valued part of a man's identity in Kabeza. Doing so well is primarily framed around ability to fulfill their role as protector and provider for the household members. Household members also look to men to solve family problems³. The most mentioned characteristic of a good man was one who loved his family and took care of these responsibilities. Such a man was expected to have the zeal to work hard in order to provide food and other material needs for his family. If necessary, the head of the household shared everything he owned with family members and sacrificed himself for the wellbeing of the family⁴. Men were expected to have exceptional farming skills, since this ensured they have the could "bring food to the table". In order to generate income to cover major household expenses, men were required to demonstrate that they were good planners, as well as frugal managers of household assets and financial resources⁵. In addition to family responsibilities, they were expected to be faithful, respectful to their wives, and be honest, serious and have integrity in their everyday dealings with other community members.⁶

Individual men's roles and responsibilities were shaped by the intersection of their gender and life stage, that is whether they were considered young men or elders. Senior men occupied positions of authority and were considered a community resource. They were expected not only to be approachable in case a community member wanted advice, but also to dispense this advice in a

³ See interviews KA17; KA18; KA21; KA26; KA29; KA31; KA37; KA50; KA51; KA54; KA57; KA63; KA71; KA79; KA82; KA83; KA84; KA88; KA89

⁴ See interviews KA02; KA04; KA06; KA15; KA24; KA28; KA37; KA40; KA43; KA45; KA54; KA62; KA75; KA86

⁵ See interviews KA10; KA15; KA18; KA22; KA31; KA33; KA37; KA43; KA44; KA46; KA52; KA53; KA56; KA69; KA73 KA74; KA88

⁶ See Interviews KA19; KA29; KA35; KA39; KA73

polite and humble manner⁷. The idea that senior men were a community resource was central and critical to the identity of elderly men. Senior men who were playing their social role well were said to be honest (*inyangamugaya*) and fair to all (see interview KA12). Senior men demonstrated that they respected themselves by being socially reserved, calm and behaving respectfully towards all community members. The most mentioned characteristic of a junior man was that he should be helpful and take care of his parents. Junior men, in particular, were expected to provide any assistance they could to widows, widowers and elderly community members.⁸

Broad expectations of men's roles produced particular responsibilities in Kabeza. In line with expectations related to their roles, men (both senior and junior) were responsible for land preparation for farming, including digging trenches for water reservoirs during the panting season and clearing land. Men (both junior and senior) participated in field work during the planting season – planting, weeding, mulching, fertilizing and harvesting.⁹ Our interviews, however, show that majority of agricultural tasks were not gendered. Rather than being the sole responsibility of men, these tasks were conceptualized as household tasks. However, a few agricultural activities were most likely to be undertaken by men. While both men and women participated in market-oriented agriculture, the majority reporting such activity were men. Further, when women engaged in agriculture with the intent of selling some of their harvest, they required permission from their husbands to harvest or sell the crops. For example, a 36-year-old woman (Interview KA08) said:

Banana plantation is considered as cash crop, but sometimes we can use it as food as well. But it requires the permission of my husband and he is the one who decides which one to cut off. Thus, the money coming from plantation – he is the one who manage[s] it as well as money from selling charcoal.

Men were also responsible for securing fodder for livestock and providing veterinary care. In addition to farming, men also participated in salaried employment and activities to generate the income for household expenses. There is some anecdotal evidence (we found only two such cases) that when men have non-farm employment, they are not expected to contribute as much labor to household agriculture. Women with such opportunities, however, do not report any such change in expectation, suggesting that while non-farm employment might provide them with needed income, it also greatly increases their overall workload. For example, a female teacher explained that “the fact that I work and not my husband, it is like I have abandoned him to manage all agricultural activities... to manage the issues of lots of activities for my husband and I try to do my best and be available in the afternoon. Especially [the] coffee plantation – to show him that I do care” (Interview KA90). We found idiosyncratic arrangements where households parsed out varying farming tasks among men and women according to time and resources available. For example, a 26-year-old man described how his household managed farming activities: “My wife, she is the one who is in charge of marshland...and both of us [are] occupied in the management of maize and beans plot” (Interview KA54). In another household a 60-year-old woman described the division of agricultural labor in this way: “My husband is in charge of banana plantation, management and selling to the

⁷ See interviews KA20; KA21; KA 24; KA26; KA36; KA37; KA39; KA40; KA42; KA47; KA50; KA56; KA61; KA67; KA78; KA84; KA88

⁸ See interviews KA20; KA21; KA 24; KA26; KA36; KA37; KA39; KA40; KA42; KA47; KA50; KA56; KA61; KA67; KA78; KA84; KA88

⁹ See Interviews KA04; KA19; KA21; KA22; KA23; KA25; KA27; KA31 KA32; KA80

market. I am in charge of [other] crops that we grow” (Interview KA04).

Both men and women agreed that final decisions about farming were made by the male head of household in consultation with household members. A 60-year-old woman explained that in her household “decision about farming is taken by my husband because he is the leader of the household and also it is because of his social role” (KA04). Even in cases where women made many of the day to day decisions the male head of household had to be consulted. As a 55-year-old man (KA14) explained, “my wife is in charge of family under my command.” Men made final decisions about the utilization of land, which is the most valuable livelihood asset. In addition to making decisions over land, men were also the keepers of household purse. A 70-year-old man explained that: “all the money I receive is for the family but I do manage it on my own, I provide my wife with all she needs to feed our small family” (KA18).

The role of women in Kabeza was defined as that of family caretaker. The most mentioned characteristic of a desirable woman was one who takes care of her children and husband. Women were also expected to play a supportive role for their husbands by being respectful, faithful, participating in farming, and helping solve family problems.¹⁰ Like men, they were also expected to be economical, frugal and good managers of family resources. Seniority had an influence on some of the roles that women were expected to play. As with senior men, senior women were expected to provide advice to other members of the community in a calm, gentle and kind manner. Unlike senior men, they were also seen as providers of childcare for their grandchildren.¹¹

In line with these roles, women participated in most agricultural activities over the growing season. Women participated in planting, weeding and harvesting of crops¹². Few women reported transporting produce to market, but many were involved in the sale of produce at local markets (KA16; KA79; KA82). Domestic work was strongly gendered and, in accordance with their role as caretakers, women are expected to perform the vast majority of domestic tasks including cooking, sweeping the house, welcoming guests, laundry, collecting cooking fuel.¹³ Women also participate in independent trading activities, salaried work, and wage labor whenever possible in order to contribute to the welfare of the household. Money earned from these independent activities is controlled by the women themselves and they are not obligated to share with their husbands. A 62-year-old woman illustrated this point when explaining how she used money from her produce trading activities: “The money made from selling my agricultural products- [I am] not obliged to share it with my husband but I give to him small amount of money for buying some drink like *urwagwa* [traditional banana beer] or sorghum beer” (Interview KA05). We found, however that a more likely arrangement is for income from both men and women to be pooled together at the household level. This is exemplified by a 40-year woman when explaining how she used her income: “For money, we make decisions together my husband and I because we all do agricultural activities together” (Interview KA27). Women report that the money pooled at the household level is used to meet their responsibility to support the household by buying food, paying for health care costs, school fees and other household expenses. Once a women’s money is incorporated into the

¹⁰ See interviews KA01; KA05; KA13; KA17; KA21; KA22; KA28; KA31; KA54; KA56; KA59; KA60; KA85; KA87

¹¹ See interviews KA03; KA04; KA08; KA15; KA24; KA25; KA28; KA30; KA33; KA39; KA51; KA54; KA60; KA63; KA68; KA75; KA77; KA78; KA81; KA89

¹² See interviews KA13; KA15; KA23; KA31; KA39; KA55; KA59; KA73

¹³ See interviews KA13; KA17; KA21; KA33; KA37; KA49; KA54; KA77; KA85; KA86

household purse, men consult women about the use of the money, but retain the final decision-making power over the family income. A 21-year-old woman (KA01) explained, “Father also makes decisions about money in our household because [he has more] experience than me and is the head of family in our house and [he] has other income (business) to increase money needed in our house.” Another 33-year-old woman explained that: ‘I don’t take this decision because I’m not legitimated to take these responsibilities as long as I have a husband’ (Interview KA80).

Men and women indicate that ideally senior women should have fewer domestic and farming tasks than junior women and other community members. While younger women were typically expected to be hard working and contribute their labor to agriculture and domestic work, the most mentioned desirable characteristics of older women was that they were loving, spend time advising younger women and stayed home (Interviews KA03; KA13; KA16; KA20). However, as a result of the genocide, the impact of other factors including HIV/AIDS, and increasing divorce rates, many widowed senior women were heads of household and bore primary responsibility for their grandchildren. This is exemplified by the case of a 57-year-old widow whose husband had died in the genocide and whose daughters were divorced. She explained her attempts to navigate her new role as the head of the household: “being a widow also it not easy. Sometimes my daughter[s] go to search for work and leave me with their kids, my grandchildren, it [has] became quite complicated [for me] to manage all of them seeing my age (Interview K09). Younger women also reported bearing primary responsibility for households although their households tended to be smaller and did not have the same labor restrictions as senior female headed households.

3.3 Discourses of Livelihoods in Kabeza

In this section, we explore discourses of livelihoods to understand the livelihood activities various community members pursue, how they frame the appropriate conduct of these activities and why. We triangulated information on observed patterns of behavior with people’s own explanations for the choices they make. There were four major livelihood activities in Kabeza. As can be seen in Figure 3.3, the most common livelihood activity was farming (rainfed agriculture), followed by animal husbandry, gardening and lastly, business activities. Respondents in all vulnerability groups also participated in informal wage labor work as well as artisan activities but at much lower rates.

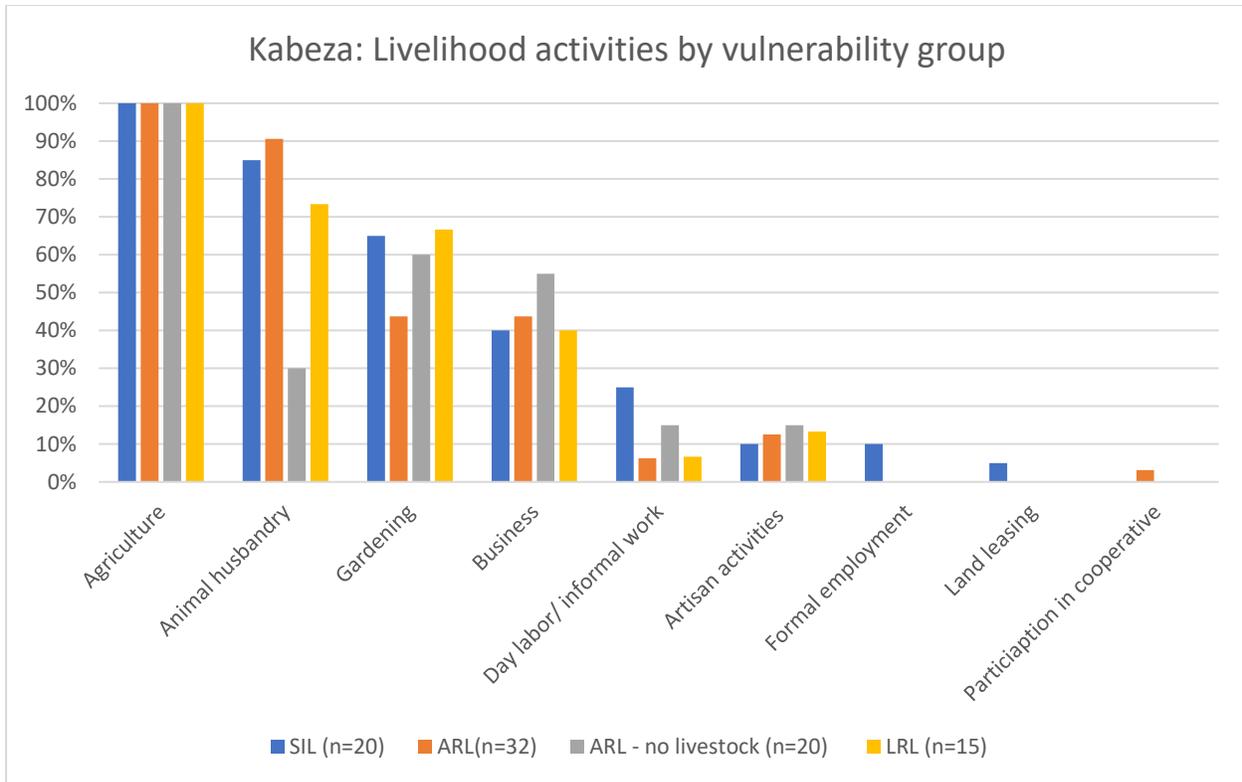


Figure 3.3: Livelihood activities in Kabeza by vulnerability group

3.3.1 Patterns of Activity

Discourses of farming centered around rainfed agriculture¹⁴, and the role this activity played in the survival of families. Agriculture was seen as a fundamental subsistence activity with production geared towards household consumption first with the sale of surpluses. This framing, however, was based on practical circumstances that farmers found themselves in rather than cultural norms dictating that households grow their own food. For many respondents, farming provided the only feasible way to feed their household. As a 76-year-old man explained, “We have chos[en] to do agriculture in Kabeza village because there is nothing else to do...I do farm these crops for my food consumption [be]cause I do not have anything else to bring us food, so I do agriculture to help me survive” (Interview KA56, see also interview KA35). Households were not necessarily averse to selling their produce, nor were they opposed to acquiring food through the market. This is illustrated by a 21-year old woman as she explained why her household consumed their entire harvest: “We eat all [the] crop and harvest because we have [a] small land to cultivate and we have a big family. We don’t sell any crop harvested in the market. Sometimes, we buy other crop to increase our foods...It means the harvest [is] small or [little] compared to our family needs” (Interview KA01). The relative ease of access to larger agricultural markets made farming an important means of earning money, particularly in the case of emergencies. In a reversal of the usual emphasis on agriculture as the center of livelihoods in this community, a 39-year-old woman argued farming was a safety net for those engaged in business as it helped to lessen the impact of seasonal fluctuations or long periods of low revenues (Interview KA03). It was also valued for the use of leaves and stems as fodder.

¹⁴ Field crops were not exclusively rainfed. Some vegetable production in fields was irrigated.

The diversity of farms declined across vulnerability groups. The average SIL farm held 5.2 crops, while ARL the average was 4.63, for ARL-no livestock 4.5, and for LRL 4.0. Men reported 4.81 crops on their fields, to women's 4.55. There were no clear gendered patterns of crop selection (Figure 3.4).

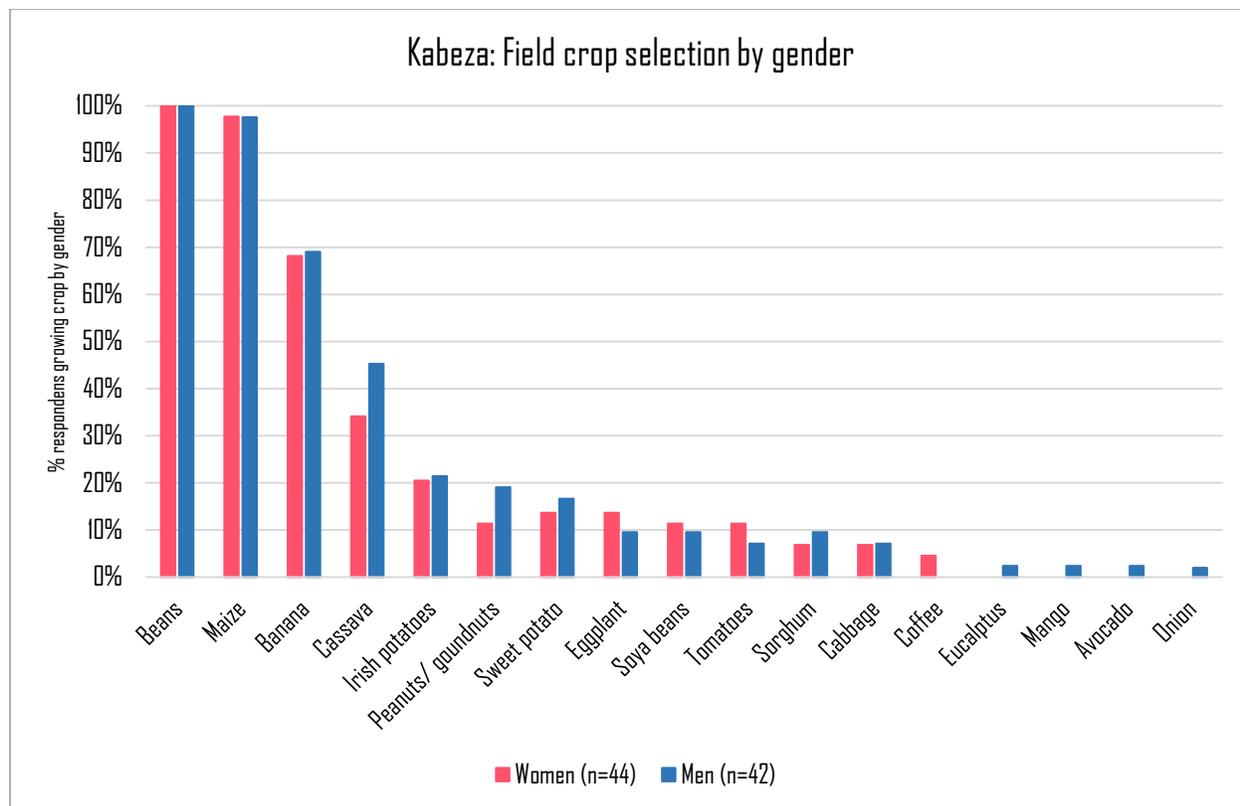


Figure 3.4: Field crop selection in Kabeza by gender

Beans, maize and banana were the primary staple crops farmed by respondents across the four vulnerability groups (Figure 3.5). There were minimal differences in crop selection across the vulnerability groups. Over 90% of respondents from all the vulnerability groups cultivated beans and maize. Several reasons were provided for the near-universal cultivation of these crops. First, they were selected because they withstand the arid conditions in Kabeza. Second, they have characteristics which make them critical for food security while at the same time maintaining the potential to earn cash for the household, including not requiring much fertilizer to grow, maturing quickly, being amenable to storage over a long period of time, and having a ready market.¹⁵ Along with these incentives to grow beans and maize, crop regionalization and the appropriation of marshland previously used to grow vegetable crops by the government, limited crop diversification choices for farmers.¹⁶ We discuss this below in more detail. Finally, since beans and maize were grown primarily for subsistence, it was possible to grow these crops using land sharing agreements (where the farmer renting land was obliged to share part of the harvest with the farmer he/she was leasing from). Harvest sharing arrangements were not the preference for growing cash crops such as

¹⁵ See interviews KA13; KA21; KA29; KA25; KA37; KA47; KA49; KA53; KA67; KA79; KA 81; KA85; KA87

¹⁶ Interviews KA08; KA10; KA13; KA38; KA54; KA70

soy beans. A 24-year-old woman (KA24) explained how she chose which crops to grow on shared land or on her own land in this way:

I choose to do such a farming system (sharing/renting land) due to shortage of land and also availability of market for soya beans and opportunity for sharing land. It may happen I share 2 or 4 lands with other farmers. Most of the time I share land for maize and beans. Soya bean is cultivated on my own land, 50*30m, so the yield I get is not shared with others so I can sell it to market.

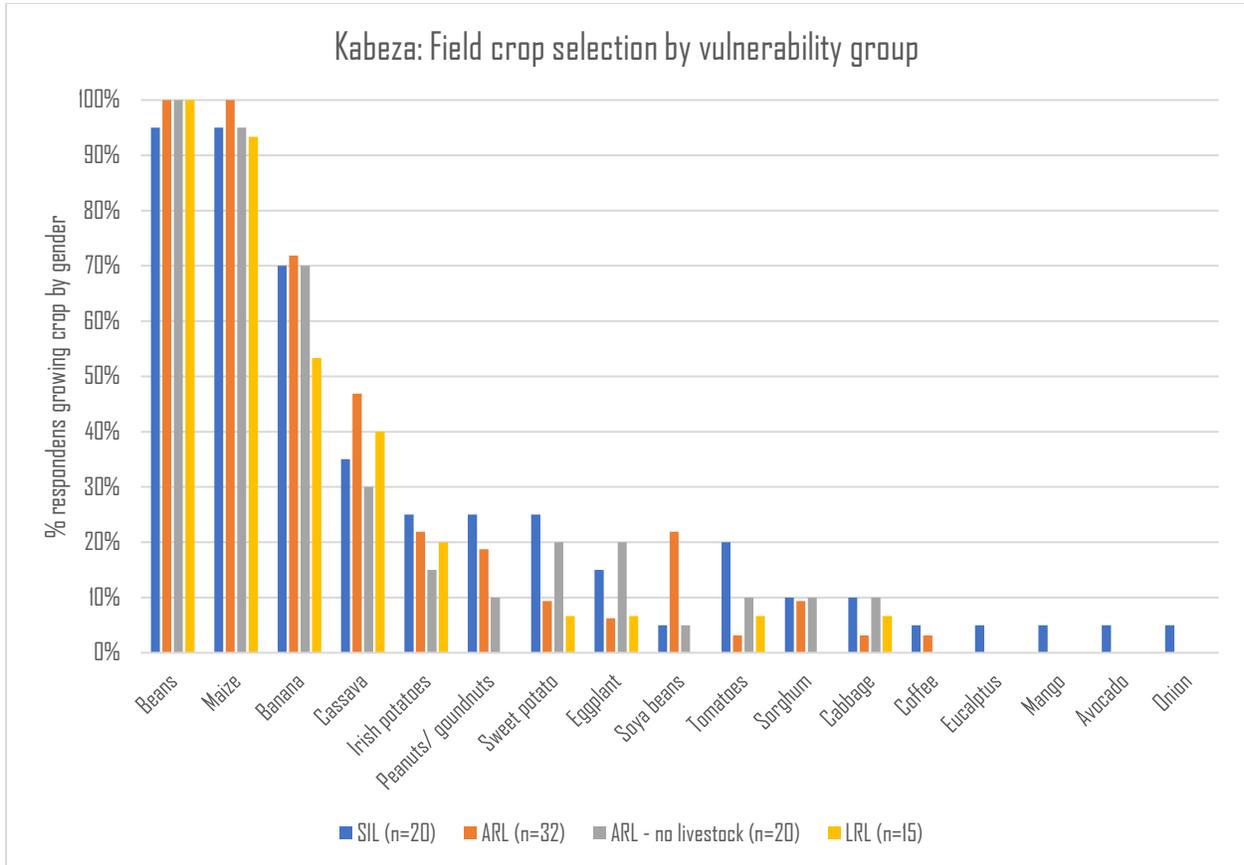


Figure 3.5: Field crop selection by vulnerability group

Approximately 70% respondents from SIL, ARL and LRL respondents grew banana while 53% of ARL-no livestock respondents grew the crop. The overall lower rates of banana cultivation can be attributed to the fact that bananas, as a perennial crop, require secure long-term land tenure. As a result, only those community members with their own land were able to grow the crop.¹⁷ Bananas were highly valued as a specialty crop suitable as both a staple crop as well as a source of cash through beer making and sale to urban markets. As a 43-year-old woman (KA16) whose household also brewed banana beer said, “We have chosen to run these activities in the village because of availability of market. Banana is important to the village. It allows our family to live and cover all of our needs. Everyday there are trucks that come from Kigali to buy banana. That is why we have jumped this opportunity to cultivate banana.” Beyond its utility, the value and pervasiveness of the

¹⁷ Interviews KA03; KA05; KA15; KA29; KA30; KA31; KA43; KA55; KA61; KA65; KA69; KA77; KA84; KA87; KA89

banana has woven it into regional identity. For example, a 33-year-old woman farmer explained why her household grew bananas in this way: “Banana is a specialty crop of the region...having a banana plantation [carries] some kind of pride” (Interview KA80).

Beyond the staple crops mentioned above, other differences emerged in the crop selections among respondents. Those with SIL cultivated a wider variety of cash crops, including peanuts, eggplant and tomato, than respondents in the other three vulnerability groups. SIL respondents were also the most likely to grow staple crops beyond beans and maize (including Irish potatoes and sweet potatoes) as well as tree crops including avocado, coffee, eucalyptus and mango. The number and diversity of cash crops on SIL fields is related to higher rates of land ownership and larger field sizes among these respondents, both of which allowed for the cultivation of additional crops (Interviews KA03; KA15; KA31). Soy was the preferred cash crop for ARL households, and cassava, which is a hardy crop that is resistant to adverse environmental conditions, appeared to be a more important staple crop for ARL and ARL-no livestock households than for those in other groups. LRL households are limited in the overall variety of crops that they can grow. Overall, these selections reflect the insecure character of livelihoods in these households, which lack the land and monetary resources to diversify their crop selections.

Forty-seven percent of respondents reported participating in kitchen gardening, the cultivation of vegetables in very small plots near their houses. Those with SIL reported the highest rate of engagement with kitchen gardening, while those with ARL-no livestock reported the lowest (Figure 3.6). Those with SIL had the most diverse gardens, with an average of 2.71 crops. Those with ARL had the least diverse, with an average of 2.06 crops, though the difference between ARL and ARL-no livestock (2.1 crops) and LRL (2.1 crops) was very small.

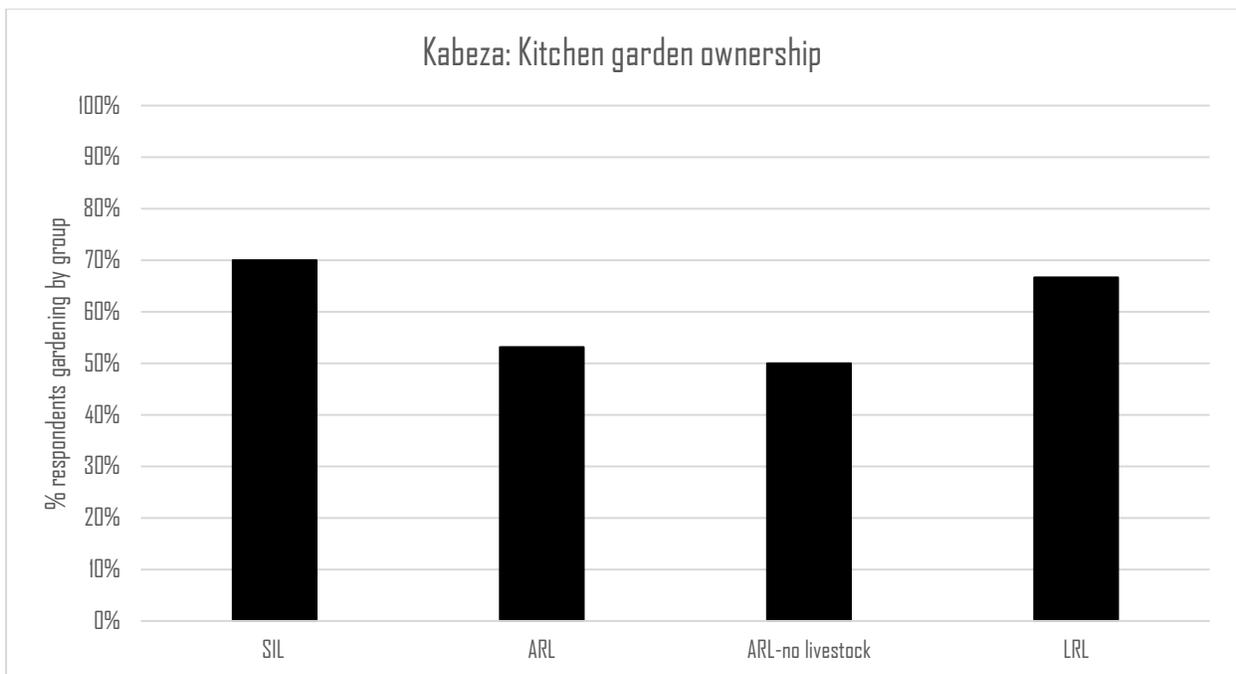


Figure 3.6: Rates of participation in kitchen gardening in Kabeza

Across the groups gardening focused on leeks and amaranthus (Figure 3.7). Cultivation of green peppers appears to be associated with livelihoods security, where those with more secure livelihoods cultivate more green peppers. The remaining crops are infrequently cultivated, and show no clear pattern of selection.

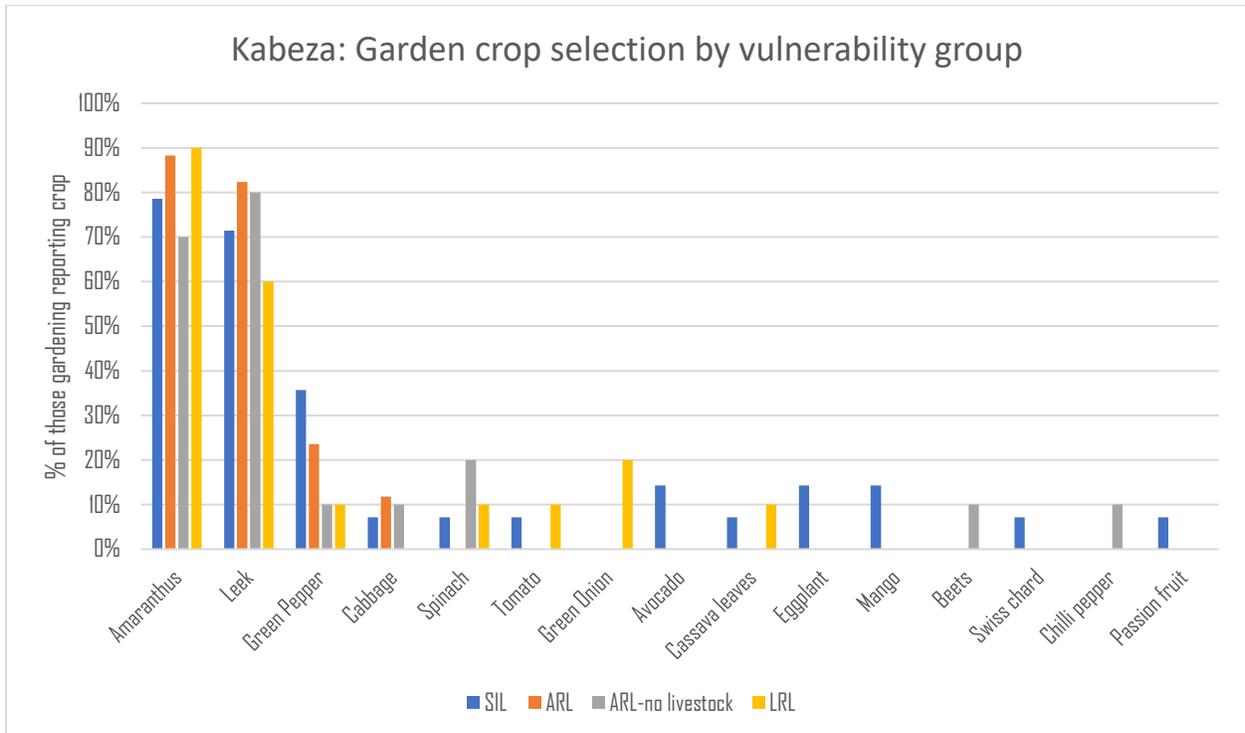


Figure 3.7: Garden crops in Kabeza as a percentage of those participating in kitchen gardening by vulnerability group

Across these groups there was an important difference in the way that men and women viewed gardening. Women’s represented this activity both a way to meet their responsibilities to contribute to the household food supply and a way to earn income. For example, a 62-year-old woman (KA05) explained the importance of gardening for her in this way, “[the] kitchen garden [is] used to plant amaranthus¹⁸, leek, and cabbage that are very necessarily for nourishing my kids.” Kitchen gardens were also particularly important in helping women sustain their household during the dry season (KA19). Gardening was also a way that women could earn some cash to cover household needs. As a 38-year-old woman (KA79) reported, “I also try to sell in market leek, peanut, eggplant, tomatoes and onion because I want other income to solve other problem in my house, for example school fees to buy clothes for children” (see also KA16; KA82 and KA77).

There was also evidence of arrangements between women and larger producers for the sale of their garden crops. For example, one 32-year-old woman (KA58) explained that she grew tomatoes for a larger producer as a strategy to assure a market for her produce: “to manage tomato competition issue, I decide to go to the producer and negotiate with him when the tomato crop is still under cultivation so I can have guarantee of [getting paid] earlier, this the strategy that I use and it is based on trust that I have [with the] producer.” Men who reported gardening activity were in fact reporting

¹⁸ Amaranthus is an edible perennial.

kitchen gardens tended by their wives, as such gardens were generally seen as a household activity. It is interesting that men generally represented kitchen gardens principally as sources of income. This reflects their limited engagement with the activity, and speaks to their priorities for this activity.

Figure 3.8 captures the relative market orientation of production for crops cultivated in Kabeza¹⁹. Overall, agricultural strategy is dominated by staple crop production, with more asset-secure individuals more confident in the cultivation of marketable surpluses. These more asset-secure individuals also report cultivating a wider range of vegetables for sale.

	Beans	Maize	Banana	Cassava	Irish Potatoes	Peanuts	Eggplant	Sweet Potato	Soy	Tomato	Sorghum	Cabbage	Coffee	Chili
SIL	Eat and sell equally	Eat and sell equally	Sell more than eat	Eat and sell equally	Eat more than sell	Sell more than eat	Sell more than eat	Eat more than sell	Sell more than eat	Sell all	Sell more than eat			
ARL	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat more than sell	Eat more than sell	Sell more than eat	Sell more than eat	Eat and sell equally	Sell more than eat	Sell more than eat	Sell all	Sell more than eat	Sell all	
ARL-no livestock	Eat more than sell	Eat more than sell	Eat and sell equally	Eat more than sell	Eat all		Sell more than eat	Eat all		Sell more than eat	Sell all	Sell more than eat		
LRL	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat and sell equally	Sell all		Sell more than eat	Eat all		Sell more than eat		Sell more than eat		

Figure 3.8: Reported crop uses in Kabeza. Crops are organized, left to right, by most to least frequently cultivated

Conversations with respondents also brought forward the role state intervention plays in changing how people farm and practice animal husbandry. The Rwandan state currently restricts the growing of particular crops such as sorghum and cassava within RL12. Although restrictions are based on assessments of the suitability of these crops to local agroecological conditions, residents saw these crops as hardy and important for mitigating the risk of harvest loss. At the time of the study, many households were still struggling to find a way to fill the gap caused by restrictions on the cultivation of these crops. In addition, a marshland which farmers relied on for crop production during the dry season was being utilized by a state sanctioned private investor to grow patchouli. Another portion of the marshland had been set aside for conservation. For example, a 38-year-old man (KA023) said “The government took my land, claiming that the area is included as marshland whereby they prepare the whole areas for environmental conservation. But they buy it from me for 250,000 RWF less than what I had paid before 500,000 RWF, resulting into a loss.” Those farmers who still owned marshland indicated that the fear of losing this land was a major stressor making their livelihoods more precarious, such as the 57-year-old man (KA87) who said “Issues faced in daily life are related to stress that we are going to be evacuated [from] the [marsh] land where we grow our cash crops.” Another farmer, a 28-year-old woman), explained her worry that she would be evicted from the marshland:

We just have 51 meters by 38 meters in season A and B. In the dry season we just focus on the marshland...Patchouli company is exploiting farmer land in marshland. We still have a chance

¹⁹ Farmers did not report uses for every crop cultivated, and some crops were cultivated by a single respondent, making the information on that crop’s use idiosyncratic.

but we are under pressure because our land will also be given to the company. But not yet. So I am cultivating and preparing to leave at any time this plot (Interview KA66).

Differences in the levels of participation in livestock keeping were an important aspect of how respondents self-assessed their vulnerability. Those with more livestock had a higher capacity to respond to various shocks and stresses as ruminants were an important source of cash for emergency and other big expenses, while smaller livestock, including chickens and rabbits, were a convenient source of cash for recurring expenses and a source of protein for the household. For most respondents, livestock was an investment to use in case of large unanticipated expenses and emergencies. Animal husbandry was also highly desirable as a source of manure for agriculture. For those able to keep larger numbers of livestock, animal husbandry was a means through which to earn cash for recurring household expenses.²⁰

There were differences in animal husbandry activities across respondents from the four vulnerability groups (see Figure 3.3 above). The highest percentage of individuals engaged in animal husbandry were those from ARL households (91% of ARL respondents), followed by those in SIL households (85% of SIL respondents). Seventy-three percent of LRL respondents and 10% of those with ARL-no livestock participated in animal husbandry. The similar rates of participation among those with SIL and ARL mask important differences in the character of this participation (Figure 3.9). As livestock is an indicator of wealth, it is not surprising that SIL respondents had the highest rates of ownership across all livestock species with the exception of sheep and bees and, on average, owned more livestock than respondents from other vulnerability groups. SIL respondents had approximately two more goats than ARL and LRL respondents and were most likely to own two cows while respondents from the other groups were likely to own only one cow. Those in SIL households are more likely to have larger numbers of livestock and larger ruminants, and therefore much more secure livelihoods than in other groups. On the other hand, the relatively high participation of those with LRL in animal husbandry, as well as the participation of those with ARL-no livestock can be accounted for by two programs. Many farmers participated in “*Onora tugabane*”, a community system through which individuals foster others’ goats (and in some cases cows as well), and in return receive any offspring from those animals. Those respondents from ARL-no livestock who reported animal husbandry activity were engaged in caring for others’ animals. In addition, many LRL respondents participated in government programs and non-governmental programs that sought to improve the income generation capacity and diversify the livelihoods of genocide survivors by providing livestock to vulnerable households. Thus, their participation in this activity was both supported by community and state interventions aimed at vulnerable populations, and was precarious in that the character of their participation was dependent on external interventions.

²⁰ See interview KA03; KA24; KA33; KA42; KA52; KA66; KA74; KA78; KA82; KA84

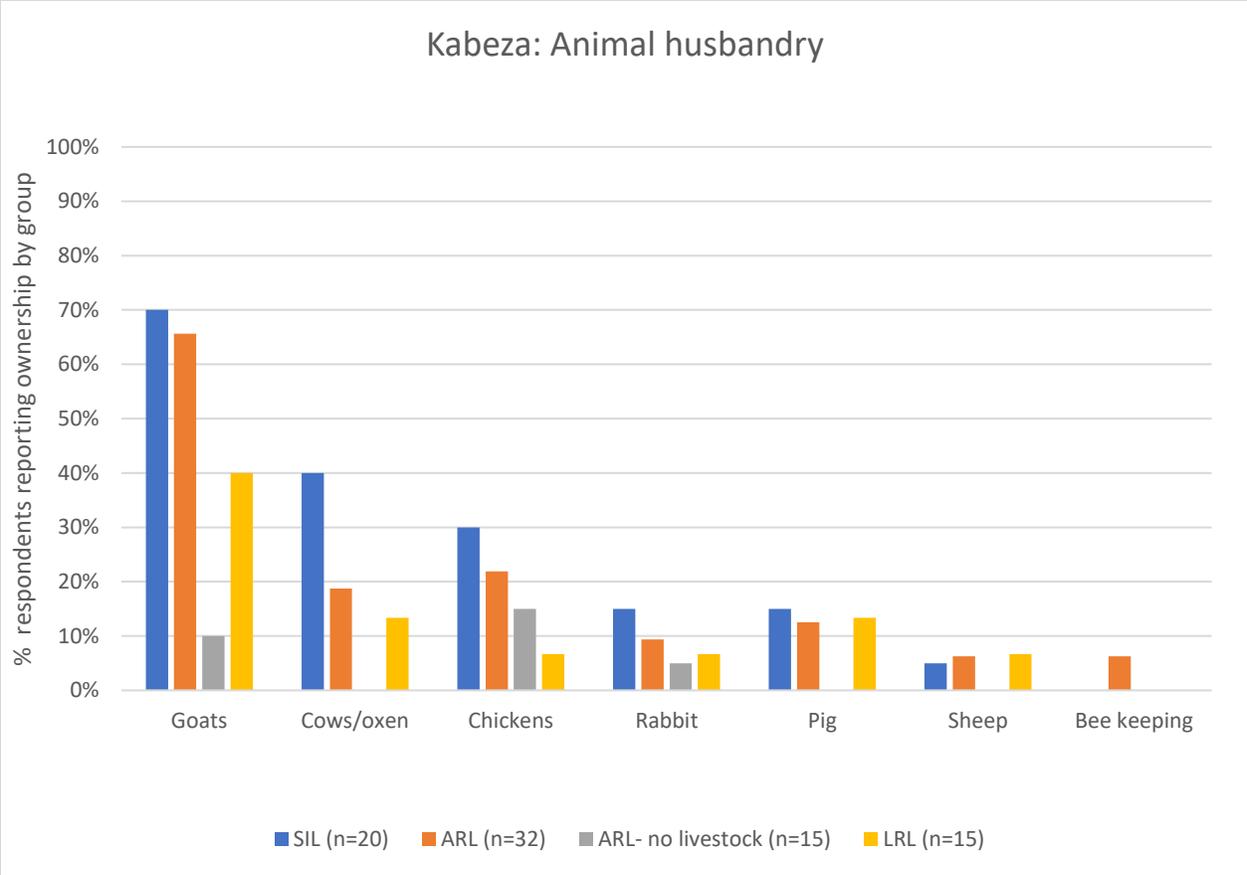


Figure 3.9: Animal ownership by vulnerability group

There are a number of constraints on animal husbandry in this zone. One that impacts all members of the community equally are government restrictions on free range livestock (particularly cattle), with the government encouraging farmers to practice zero grazing (confined livestock grazing) instead. As a 35-year-old man explained: “raising cows [has] become very complicated in the area due to expropriation of land [by the government for private investors] where we used to graze. Agriculture [now] remains the only source of income [for the] household (KA62, see also KA47). For some farmers these changes forced a reorientation in their livelihood strategies. A 31-year-old man reported “Moto taxi is my livelihood. I bought this motorcycle from selling two cows...I chose to do this activity after selling my cows when [the] zero grazing problem [was] installed and all farmers obliged to respect it. I was not able to raise two cows in this program as there was scarcity of fodder” (interview KA84). Another farmer, a 36-year-old woman (KA08), described how she had been forced to reduce the household herd and invest in a charcoal selling business: “Raising cattle these days have become a challenge due to the problem of zero grazing introduced by the government. I used to raise six cows but now I just have two for milk. The other four cows have been sold to start business of charcoal, this is due to the difficulty to access fodder.” Poultry ownership was minimal across all vulnerability groups. This was attributed to the occurrence of *umuraramo* (chicken pneumonia) in the area, which had decimated chicken flocks. At the same time, replenishing flocks was difficult since chickens were likely to cause damage to neighbors’ crops and lead to conflict. A 27-year-old woman (KA57) said “For chickens, I have money to buy them but there is a disease in chickens which attacked all of them and caused them to die and we don’t have the medicine for it. In addition, I [could] raise chicken but now am not because they damage the

banana of my neighbor” (see also interviews KA19; KA23; KA55; KA69; KA73). The low rates of ownership for pigs was attributed to religious beliefs regarding the sordidness of these animals. The low rates of rabbit and bee keeping were related to upkeep expenses needed.

Many residents of Kabeza took up some form of nonfarm employment. As noted above, these activities (with the exception of formal employment) were secondary to agriculture and even animal husbandry, playing a supporting role to these activities. For example, a 61-year-old woman (KA44) noted that during the dry season mid-June to September, she was occupied with weaving ropes and selling the rope at the market. She engaged in this activity to provide income for her and her household when agriculture could not do so. A 50-year-old woman (KA74) made this clear when discussing her husband’s nonfarm activities: “The other activities that we are involved in is bricks making and carpentry by my husband. These activities are good to use because it is what my husband is capable of to bring extra money home when he finds work.” Again, nonfarm activities provide *extra* money, but are not the core of the livelihood strategy. Interestingly, there was some suggestion that nonfarm activities would become more attractive as stressors like climate variability and change and land expropriation became more challenging. For example, a fifty-year-old woman (Interview KA48) with SIL said:

The business we are running is about selling beer. My husband has a store where he does these activities. He started doing business of selling beer when agricultural activities started to become complicated to manage due to climate, perturbations, scarcity of rain, land sharing, and expropriation by the Patchouli company in lowland. So, feeding eight persons becomes too hard, so we adopted doing extra agricultural activities that can overcome household needs.

However, even as an individual with SIL mentions the possibility of an adaptation pathway through non-farm employment, she reasserts the centrality of agriculture to her and her family’s livelihoods.

3.3.2 Summary: A Shared Discourse of Livelihoods

These patterns of participation in rainfed crop cultivation and livelihood activities, and the character of that participation, suggest that livelihood assets produce different abilities to execute strategies informed by broadly-shared discourses of livelihoods. Livelihoods center on agricultural production. This production first aims at achieving stability in food and income for the household, thus explaining why somewhat more vulnerable households that still have some land assets (ARL and ARL- no livestock) were more likely to cultivate defensive crops such as cassava, even in the face of government restrictions on such crops. Only when such stability and security was ensured did households diversify into wider selections of cash crops. Animal husbandry has a similar framing: animals are owned and raised to address unexpected expenses first and foremost, thus providing a degree of security for the household. Animals become sources of income and opportunity only when a household can obtain enough to allow for their sale without compromising their security in the face of possible shocks and stressors. Gardening was also a subsistence-first activity principally conducted by women. Across all groups, women reported that some marketing of garden production takes place. Finally, nonfarm employment plays a distinctly secondary role under this broad discourse of livelihoods. These are activities one takes up to support agriculture and livestock husbandry, or activities that one undertakes when not engaged in these other more important activities.

3.4 Kabeza: Subgroup Activities and Decisions

The differences in livelihoods activities seen between the groups relate to their access to critical assets like land, and thus their ability to live up to the ideals embodied in this discourse. However, important differences exist within these groups that shape livelihoods decisions. In exploring the discourses of livelihoods of each of the four groups we can identify the specific activities associated with different individuals in Kabeza, allowing us to explore which activities are associated with particular identities, roles, and responsibilities under different assemblages of vulnerability.

3.4.1 Stable Income Livelihoods

All SIL respondents were engaged in farming (Figure 3.10). More SIL women than men were engaged in animal husbandry (92% compared to 75%) and gardening (75% compared to 50%). Forty two percent of SIL women and 38% of men participated in business activities. Only women were engaged in artisan activities. Only men were involved in leasing land.

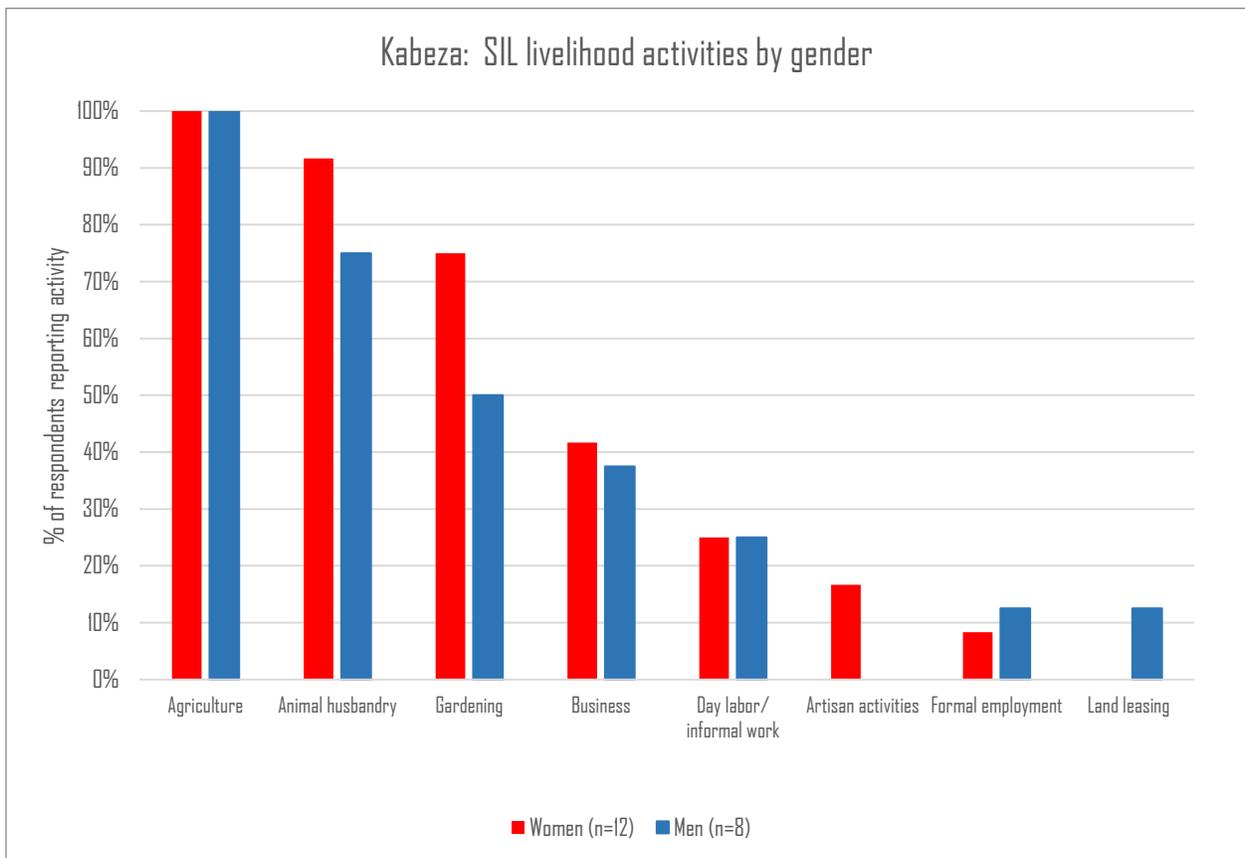


Figure 3.10: Livelihood activities reported by SIL respondents by gender

Field crop selection among those with SIL reflects an effort to balance household consumption and income generation. Most fields contained beans, maize, and bananas, along with two more vegetable crops (though 42% of women and 25% of men cultivated cassava, a subsistence crop) (Figure 3.11). Men cultivated a slightly broader range of vegetables than women.

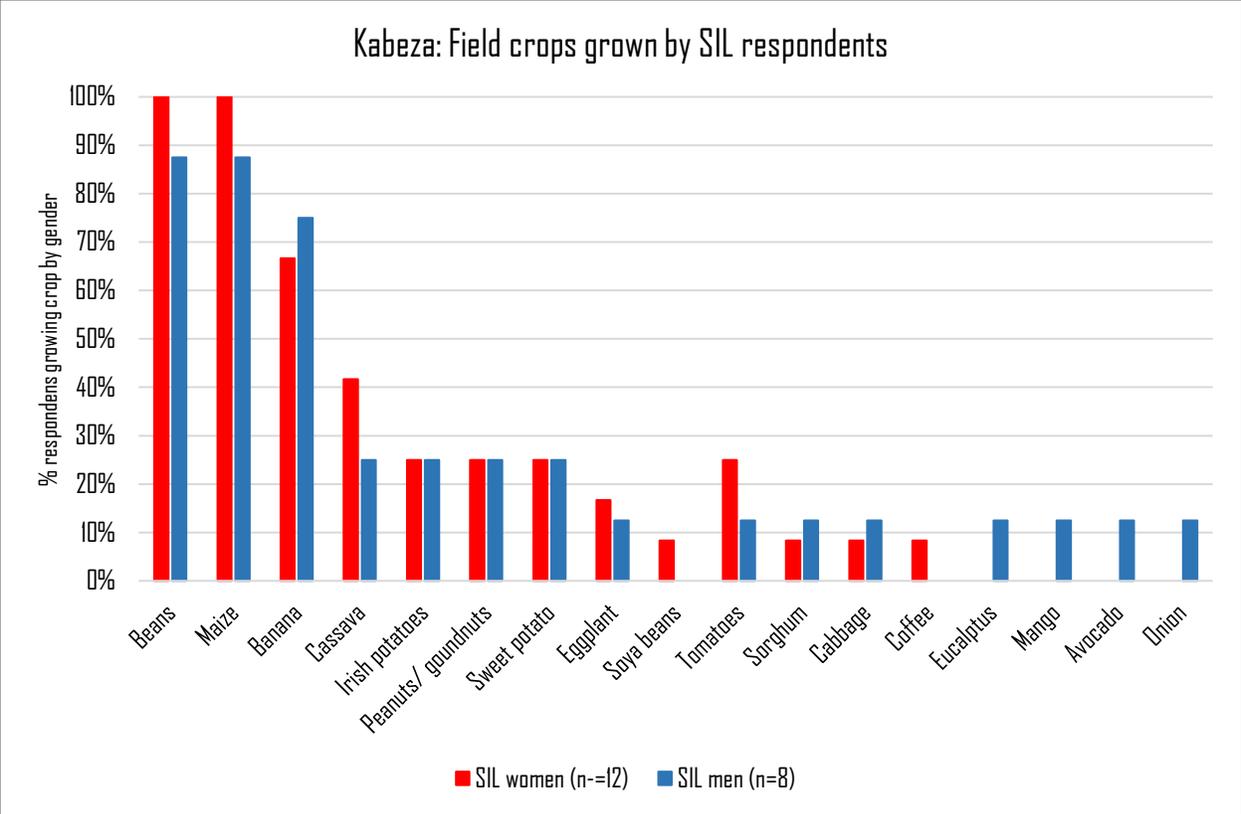


Figure 3.11: SIL field crop selection, by gender

SIL gardens contain the largest average number of crops of any group (2.71). Garden crop selections demonstrate that those with SIL who reported gardening activity were principally focused on subsistence production, with amaranthus and leek dominating their production (Figure 3.12). However, the average SIL gardener cultivated one non-subsistence crop, building in a market component to this production.

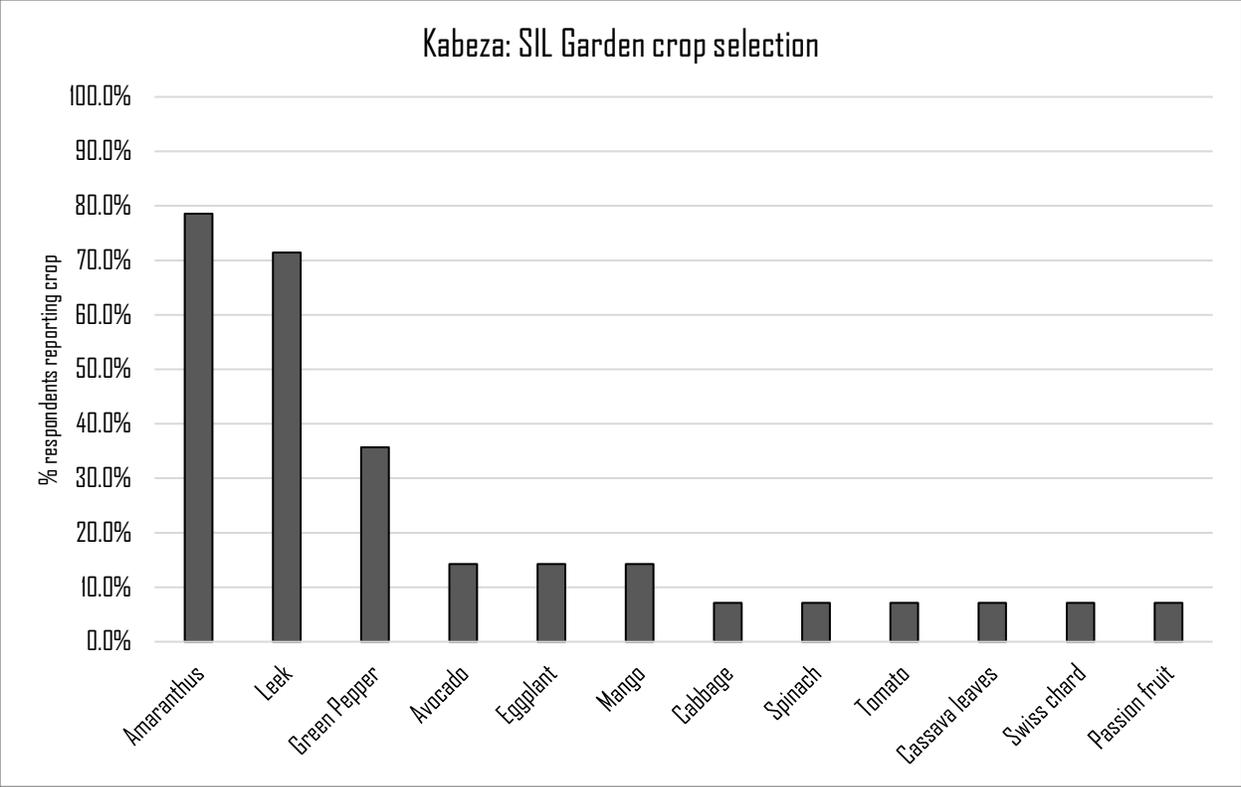


Figure 3.12: Garden crop selection among SIL respondents.

The uses of crops reported by those with SIL reflect agricultural and gardening efforts heavily oriented toward either the production of marketable surpluses or market sale (Figure 3.13). There are few gendered differences in the reported uses of crops in this group.

	Beans	Maize	Banana	Cassava	Irish Potatoes	Peanuts	Eggplant	Sweet Potato	Soy	Tomato	Sorghum	Cabbage	Coffee
SIL men	Eat and sell equally	Eat and sell equally	Sell more than eat	Eat more than sell		Sell more than eat	Sell more than eat	Eat more than sell		Sell more than eat		Sell more than eat	
Sil women	Eat and sell equally	Eat more than sell	Sell more than eat	Sell all	Eat more than sell	Sell more than eat	Sell all	Sell more than eat		Sell all			

Figure 3.13: Crop uses reported by SIL residents, by gender. Blank cells represent situations where a crop was not cultivated or no use was reported.

While crop-level uses help us to understand broad agricultural strategy among men and women in this group, this strategy is in fact more complex and visible at the level of variety selection in key staple crops. Broadly speaking, most bean varieties were selected based on their suitability to the climate and taste. Only one SIL woman mentioned a preference for selecting bean varieties based on the suitability of the leaves to be consumed as vegetables, while another reported considering the potential use of bean stalks as fuelwood when selecting varieties. While SIL respondents grew a wide range of bean varieties, *Coltan*, cultivated by 40% of SIL farmers (n=8) and *Shushya*, cultivated by 60% (n=12) were the most commonly grown. Both varieties were short cycle varieties (two months),

drought resistant, had a good yield and good market demand. All SIL respondents cultivating *Coltan* sold their harvest. Among SIL cultivators, *Shushya* is viewed more as a subsistence crop. One third of those cultivating this variety ate all of it, while the remaining farmers reported eating more than they sold. The variety was selected for consumption as it was easy to cook, requiring less fuelwood than other bean varieties. Women cultivated *Coltan* at a slightly higher rate than men, and generally marketed at least some of their *Shushya* production. An equal number of men reported consuming all of their *Shushya* and eating more than they sold. These patterns of use for beans suggests that women have a slightly more market-oriented set of goals for their bean production than men.

Half of all SIL respondents (n=10) reported cultivating *Gatumane*, making it the most commonly-cultivated maize variety in this group. Stated preferences for this variety include its suitability for consumption and sale, as well as its drought resistance. Of those cultivating *Gatumane*, 70% ate more than they sold, while another 10% ate all they raised. Other commonly grown varieties included *Kanyamumesa* (15%) and *Kigega* (10%). Those who reported cultivating these two varieties said they did so because they were well adapted to the conditions of Kabeza, particularly drought, and because they had a pleasant taste and a yellow color preferred for dough. Both SIL respondents reporting the cultivation of *Kigega* sold more than they ate. Of those cultivating *Kanyamumesa*, two sold more than they ate, one sold and ate roughly the same amount, and one ate more than they sold. Seventy percent of those cultivating *Gatumane* were women. The same number of men and women reported cultivating *Kanyamumesa*, but both men reported selling more than they ate while the women ate more than they sold or consumed all of the harvest. Among those with SIL, maize cultivation overall is principally a subsistence activity, but men have a slightly greater orientation toward generating income from maize than women.

SIL respondents focused on the cultivation of three banana varieties: *Inyamunyu* (55% reported cultivating this variety), *Imbibere* (15%), and *Phia* (10%). According to the 11 SIL respondents who cultivated it, *Inyamunyu* was selected for its longevity, as it had a 30-year lifespan. This reinforces the importance of secure land tenure in the decision to cultivate bananas in Kabeza. Those cultivating this variety did so for a variety of reasons: four sold more than they ate, one sold and ate this variety in equal measures, four ate more than they sold, and two ate all. This suggests that this variety's versatility, as well as its taste and drought-resistant qualities, drove its selection. Men and women reported very similar patterns of use for this variety. *Phia* was an improved variety promoted by the ministry of agriculture (MINAGRI), but only cultivated by two SIL women, both of whom sold all of their crop. *Imbibere*, cultivated by three SIL farmers, was valued as a drought resistant variety that could be utilized for making alcohol and banana juice for sale. The two women and one man cultivating this variety sold all of their crop. Overall, banana cultivation among those with SIL reflects a balance between subsistence and income needs, with women slightly more engaged in the market sale of this crop.

The reported patterns of engagement in animal husbandry show that although this is a household activity with both men and women making decisions, women in better-off households may do more livestock caretaking on a daily basis than men (Figure 3.14). In addition, women in SIL were more likely to report relying on the sale of livestock in order to acquire seed and fertilizer. This is not surprising, as the bulk of animals owned by this group are goats and chickens, smaller animals that are commonly used as sources of income when needs arise.

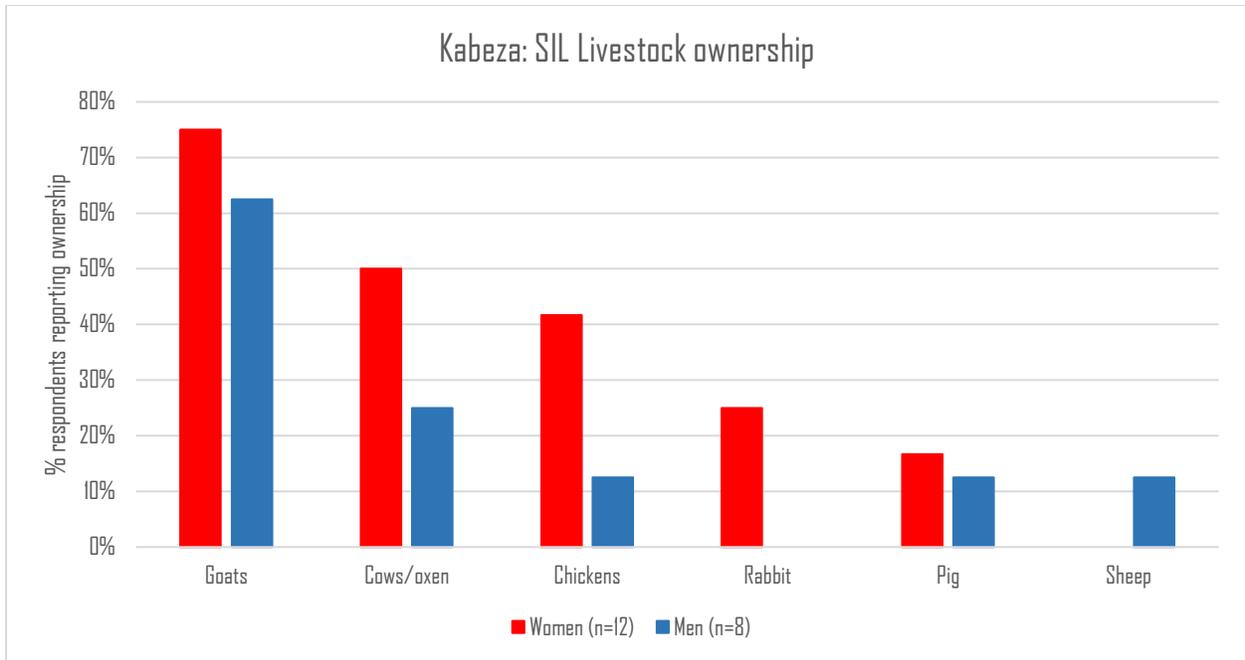


Figure 3.14: Reported livestock ownership for SIL residents of Kabeza

Those with SIL are the most secure members of this community. Their agricultural efforts produce a secure subsistence, and often a marketable surplus. A substantial number of people with SIL are food secure enough to plant varieties of crop that are specifically targeted for sale at market. They own more animals than any other group, and more of every type of animal. As a result, unlike members of other groups, those with SIL look at their animals not only as a source of security in the face of uncertainty, but as a vehicle for investment in their farms. This group has a relatively low rate of participation in business activities, at least in part because they do not need to diversify their livelihoods beyond agriculture and animal husbandry to meet their needs and goals. Within this group, women and men both participate in subsistence and income-generating activities, most evident in their variety selections. Women are both more likely to use at least some of their bean harvests for marketing, and to select bean varieties that are appropriate for market sale, than are men. On the other hand, while men and women reported very similar uses for maize, men tended to view their *Kanyamamesa* harvest as more for sale, while women viewed it as a subsistence variety. In gardening, gendered roles become clearer: women largely garden for subsistence, while men garden for market sale. Because engagement in business and non-farm employment NFE is largely viewed as secondary to and supportive of work in agriculture and livestock husbandry, it is not surprising that the most secure members of the community, who do not need much additional support to see success in these two livelihoods activities, have low rates of engagement in business.

3.4.2 Adequate Resource Livelihoods

On the surface, the livelihoods activities of those with ARL look very similar to those with SIL. ARL livelihoods activities center on agriculture and animal husbandry, with members of this group reporting the highest rate of participation in animal husbandry of any group. However, a slightly deeper look into ARL activities highlights important differences between those with ARL and those with SIL. As with the previous two vulnerability groups, all ARL respondents engaged in agriculture (Figure 3.15). Both ARL men and women reported animal husbandry activities, but unlike those

with SIL, ARL men reported higher rates of engagement than women in nearly all livelihoods activities. Few respondents reported engagement in day labor and in cooperatives, making it difficult to draw any conclusions regarding these activities. However, it seems that both men and women did participate in informal work whenever these opportunities were available.

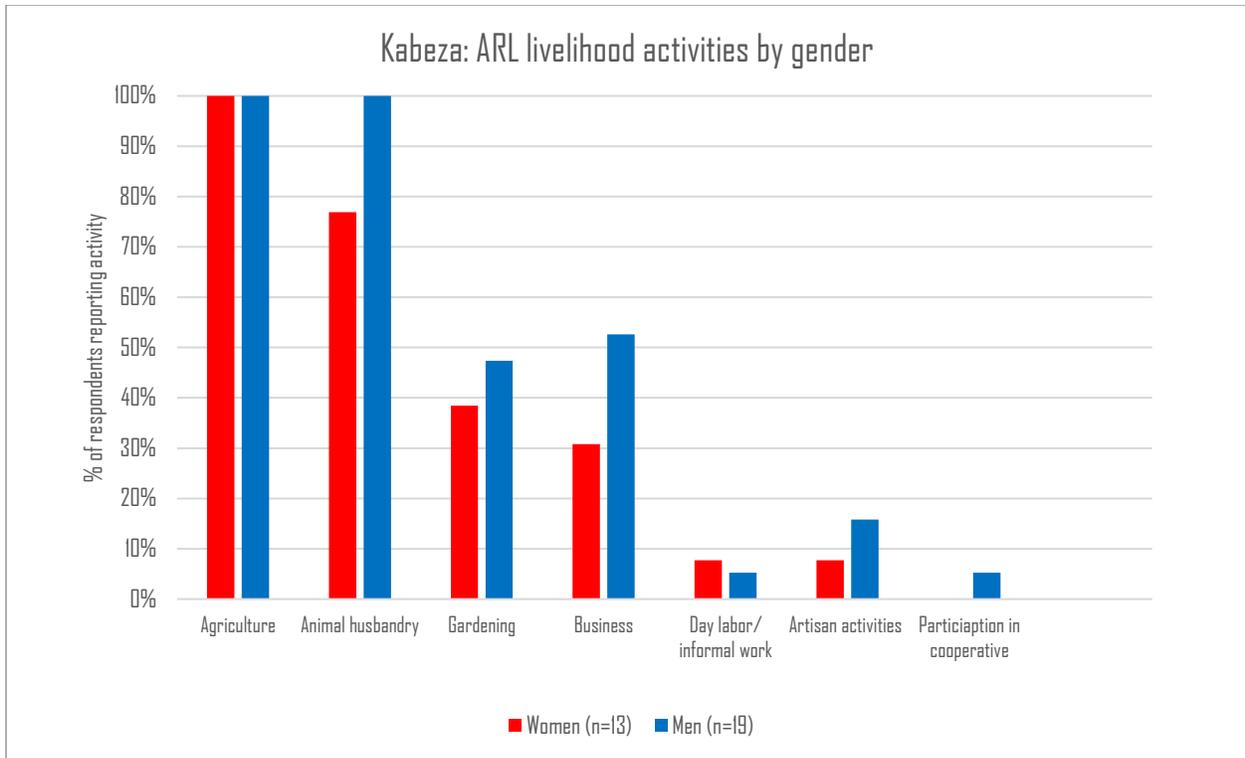


Figure 3.15: Livelihood activities reported by ARL respondents by gender

Crop selection among those with ARL demonstrates a more gendered approach to field agriculture (Figure 3.16). ARL men cultivate an average of 4.63 crops, to ARL women's 4.38. Much of this difference, however, is attributable to a gendered difference in the cultivation of cassava. More than 60% of ARL men cultivate cassava, while only 23% of ARL women report cultivating this crop. As cassava is a hardy staple usually cultivated for subsistence purposes, this suggests that men feel the need to create an agricultural safety net in a manner we do not see among those with SIL.

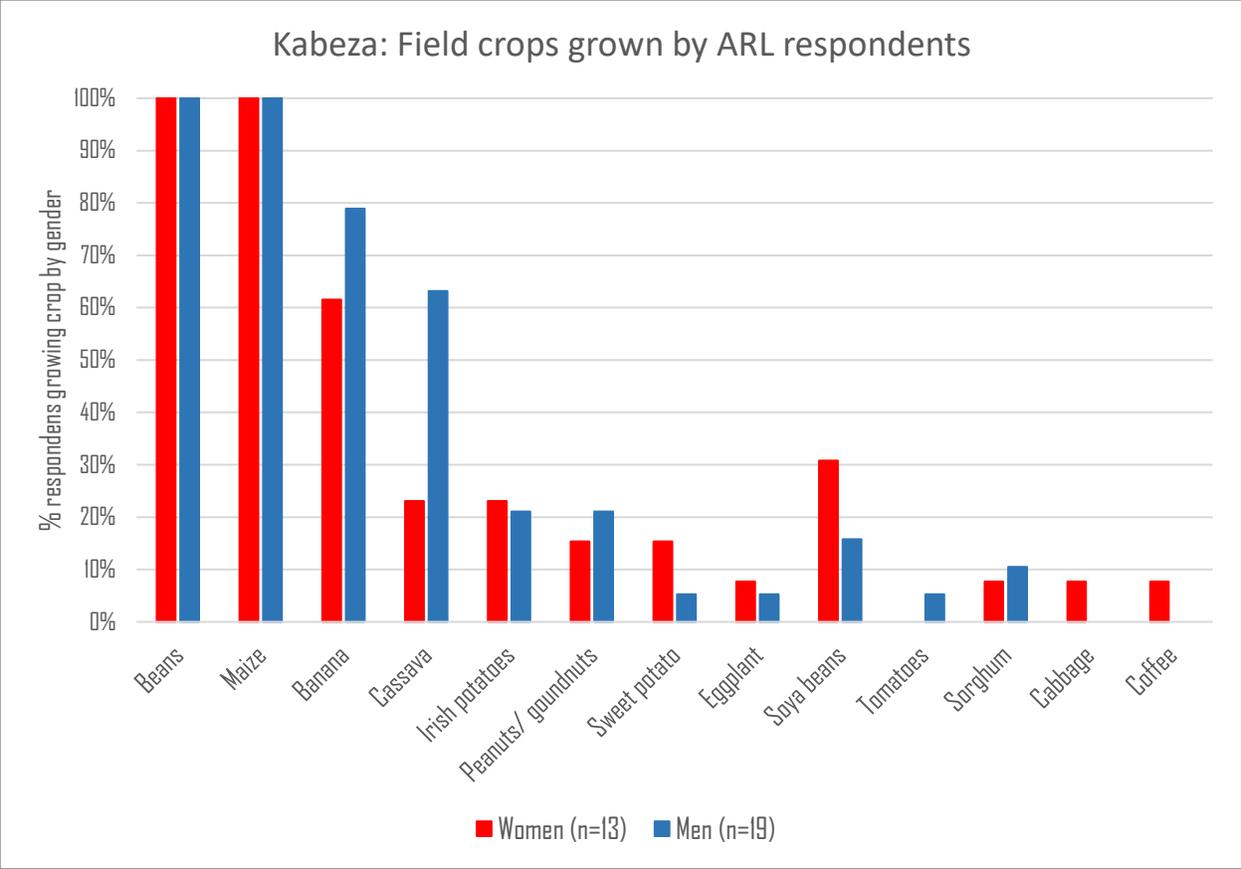


Figure 3.16: ARL field crop selection in Kabeza, by gender

Only 53% of those with ARL reported gardening. Overall, ARL garden production is much more subsistence oriented than seen among those with SIL. The average ARL kitchen garden contained 2.06 crops, fewer than seen among those with SIL. Of the two crops beyond the subsistence-oriented leeks and amaranthus, cabbage is also often used for subsistence purposes (Figure 3.17). Only two respondents reported cultivating a market crop, green pepper. Thus, among those with ARL, gardening is a subsistence-oriented activity.

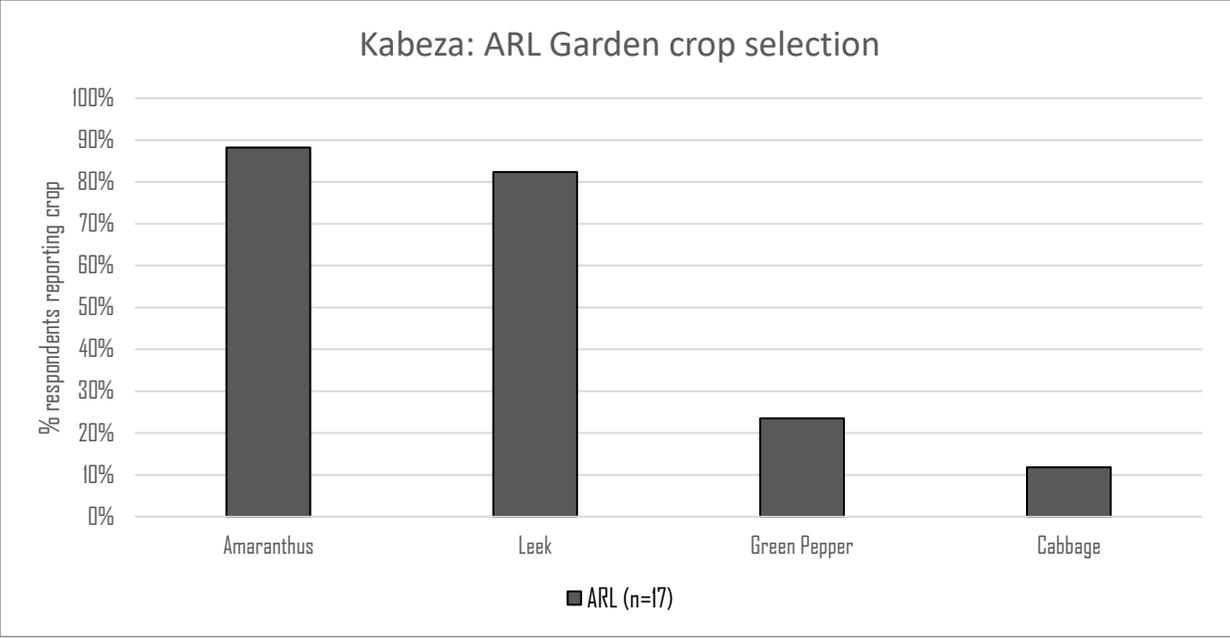


Figure 3.17: Garden crop selection among those with ARL

Crop and crop variety selection among those with ARL was similar to that seen among those with SIL in that it was geared towards both household consumption and sale (Figure 3.18). Again, there are few differences in strategy between men and women.

	Beans	Maize	Banana	Cassava	Irish Potatoes	Peanuts	Eggplant	Sweet Potato	Soy	Tomato	Sorghum	Cabbage	Coffee
ARL men	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat more than sell	Eat more than sell	Sell more than eat	Sell more than eat	Eat more than sell	Sell more than eat	Sell more than eat	Sell all		
ARL women	Eat more than sell	Eat and sell equally	Sell more than eat	Eat more than sell	Eat more than sell	Sell more than eat	Sell more than eat	Sell more than eat	Sell all			Sell more than eat	Sell all

Figure 3.18: Crop uses reported by ARL residents, by gender

As among those with SIL, the broad agricultural strategy among men and women in this group is rendered more complex at the level of variety selection in key staple crops. *Coltan* (cultivated by 37.5% of respondents) and *Shushya* (52.6%) were the most commonly grown bean varieties. All respondents in this vulnerability group sold all of their *Coltan* harvest. Just over 44% of ARL respondents who cultivated *Shushya* consumed their entire harvest. An additional 27.8% ate more than they sold, while a single male farmer reported selling and eating *Shushya* in equal quantities. Two thirds of those cultivating *Coltan* were men. Men and women reported very similar patterns of use for *Shushya*. In this group, bean production suggests that men had a greater focus on income generation than women, who marketed relatively infrequent surpluses. This greater focus on market production, which reverses the focus seen among men with SIL, may reflect the fact these men cultivate far fewer vegetables on their fields, and therefore have fewer opportunities to earn income from their production.

Gatumane was by far the most-cultivated variety of maize for those with ARL. Just over 65% of this group reported cultivating this variety, versus 6.3% for *Kanyamumesa* and 3.1% for *Kigyega*. The reported uses of *Gatumane* in this group were broad, with only 14.3% reporting eating the entire harvest of this variety. The other farmers reported eating more than selling, selling and eating equally, and selling more than eating in equal ratios (28.6% each). However, two thirds of women either ate and sold the same amount of this variety, or sold more than they ate. Only half of men reported these uses, with the other half eating all of the harvest or eating more than they sold. This suggests that women were more market-oriented in their use of this variety than men. The three farmers cultivating *Kanyamumesa* reported three different uses for this variety: consuming the entire harvest, consuming more than they sold, and selling and consuming it equally. The two women cultivating this variety were more subsistence-focused in their production than the one man. In this group only one farmer, a man, reported cultivating *Kigyega*. He reported selling all of his harvest. Thus, maize production in this group demonstrates gendered preferences for varieties.

Among ARL respondents, 31.3% cultivated *Inyamunyu*, 50% *Imbibire*, and 25.0% *Phia*. The majority (68.8%) of ARL respondents cultivating *Inyamunyu* reported using the crop for subsistence, or using the majority for subsistence with some market sale. All but one farmer cultivating *Imbibire* sold all of their harvest, with the other farmer selling more than she ate. *Phia* was principally cultivated for sale, with some eating a little of the harvest and one man claiming to eat more than he sold of this variety. Women and men reported very similar patterns of use for each of these three varieties. In this group, bananas were principally a subsistence crop, with limited cultivation of varieties for market sale. This likely reflects the limited ability of ARL respondents to access the land needed to expand cultivation and diversify varieties or harvest a marketable surplus.

In summary, it is clear that those with ARL have less-diversified farms, cultivate fewer marketable vegetables, and report greater rates of cultivation of cassava, a hardy staple that can play a defensive role against issues like inadequate or unpredictable rainfall, than those with SIL. This suggests that ARL agricultural production is less robust than that seen in SIL households, and that agricultural decisions in this group are more focused on protecting yields than expanding income and food supply.

More ARL men (53%) than ARL women (31%) participated in business activities, a pattern of engagement reversed from that seen in SIL, but mirrored those with ARL-no livestock (see discussion below). This lower rate of ARL women's engagement in gardening and in business indicates that, when household resources outside of those dedicated to rainfed agricultural activity became available were more likely to be utilized by men in order for them fulfill their responsibility to provide income as head of household.

Finally, those with ARL may participate in animal husbandry at a slightly greater rate than those with SIL, but they own fewer animals, and the animals they own are smaller and less valuable (Figure 3.19). As a result, those with ARL do not see their animals as sources of investment in agriculture or other activities, but as resources to be used when a shock or stressor challenges their somewhat-fragile agricultural production.

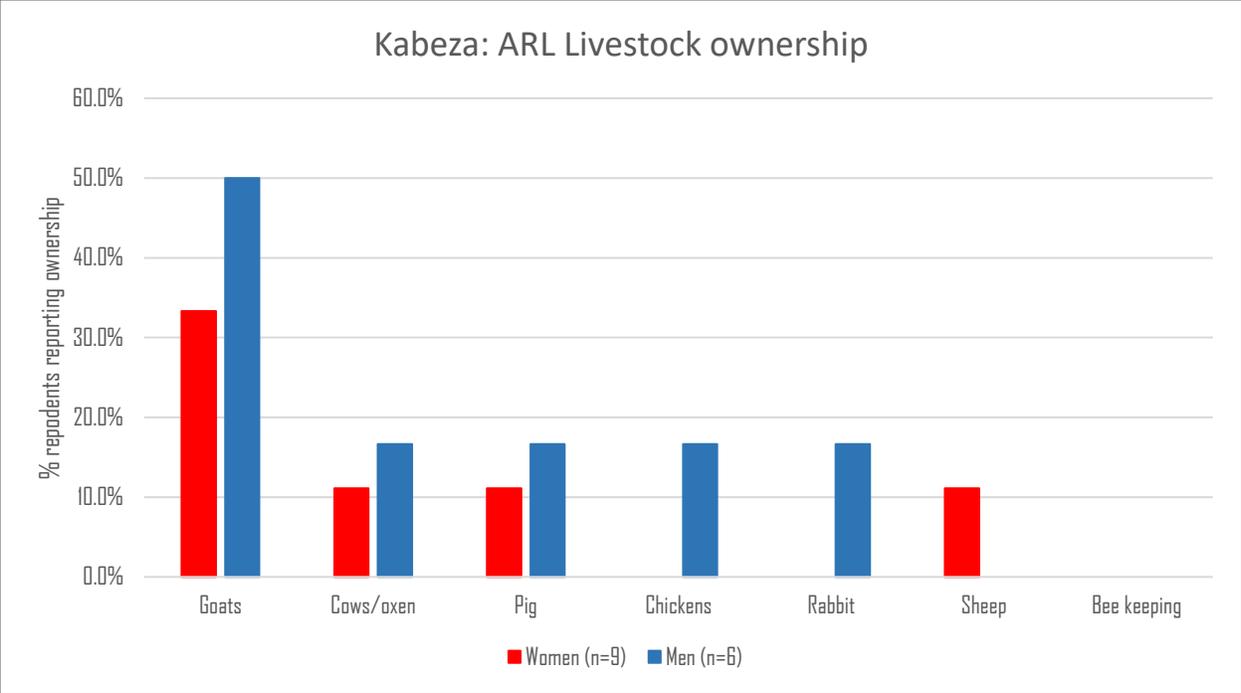


Figure 3.19: Reported livestock ownership for ARL residents of Kabeza

In summary, those with ARL are managing more precarious situations than their SIL colleagues. Their gardening is subsistence-oriented, and their rainfed crop selections suggest a subsistence-orientation in that activity as well. More ARL men than women participate in animal husbandry, business, and artesian activities. This is a reversal of the relative rates of participation seen in SIL, and reflect ARL men’s need to generate more income from a wider range of activities to meet their responsibilities. The depression of women’s participation in these activities is the result of two factors. The first is that ARL households have fewer resources upon which to draw to facilitate women’s participation. The second is that ARL men, who are stressed in meeting their responsibilities and living up to their roles, likely see the income potential of women’s participation in these activities as a threat to their status. Thus, boosting women’s participation in these activities, while likely to produce a material benefit to these households, will also likely increase intrahousehold stress if such participation puts men’s roles under further stress.

3.4.3 Adequate Resource Livelihoods-no livestock

As with those in SIL, all ARL-no livestock respondents engaged in agriculture (Figure 3.20). Only women reported being engaged in animal husbandry. These respondents participated in *Onora tugabane*. As among those with ARL, in this group more men than women were engaged in gardening and business activities. Although the percentages of those reporting engagement in day labor/informal work and in artisan activities is relatively low, making it difficult to generalize about these activities individually, taken together with rates of participation in other activities they suggest that among those with ARL-no livestock, men were more likely to participate in off-farm activities than women. No respondents from this group were engaged in formal employment or land leasing.

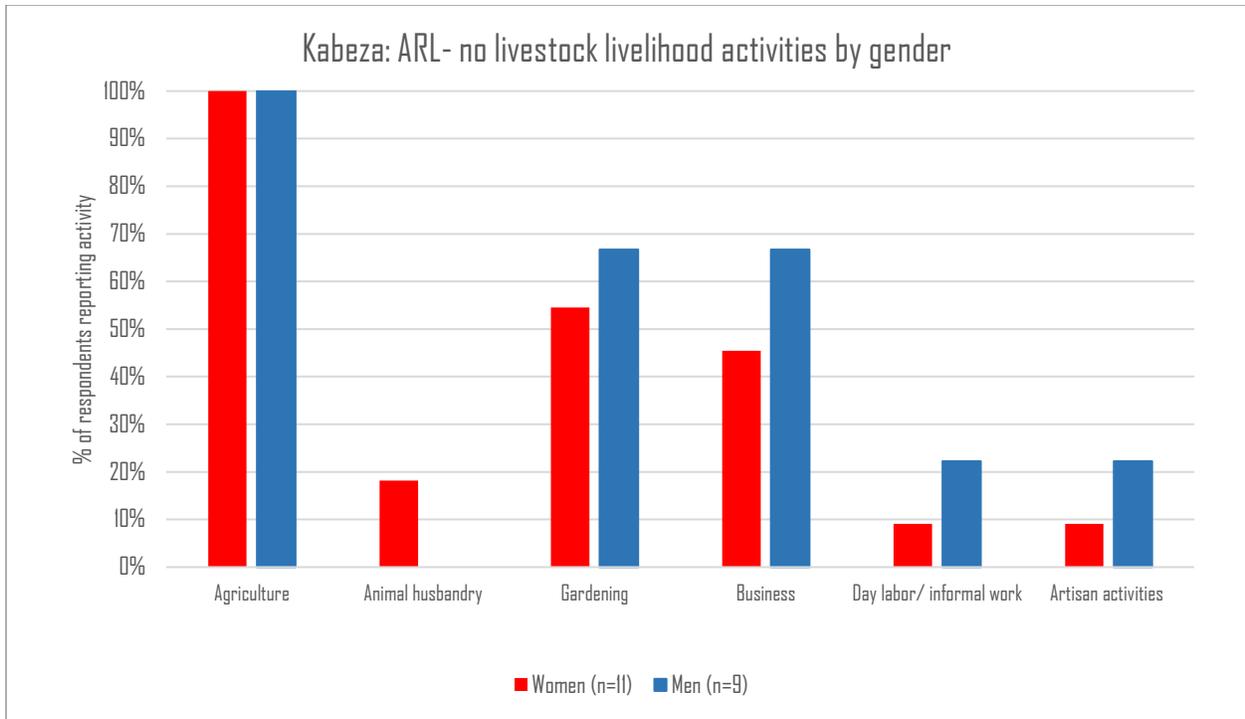


Figure 3.20: Livelihood activities reported by ARL-no livestock respondents by gender in Kabeza

Men with ARL-no livestock cultivate an average of 4.89 crops on their fields, while women in this group cultivate 4.18. As women participate in banana cultivation at a higher rate than men, this means that men are cultivating more marketable vegetables than are women (Figure 3.21). Thus, ARL-no livestock field production appears to be somewhat less defensive than that of those with ARL.

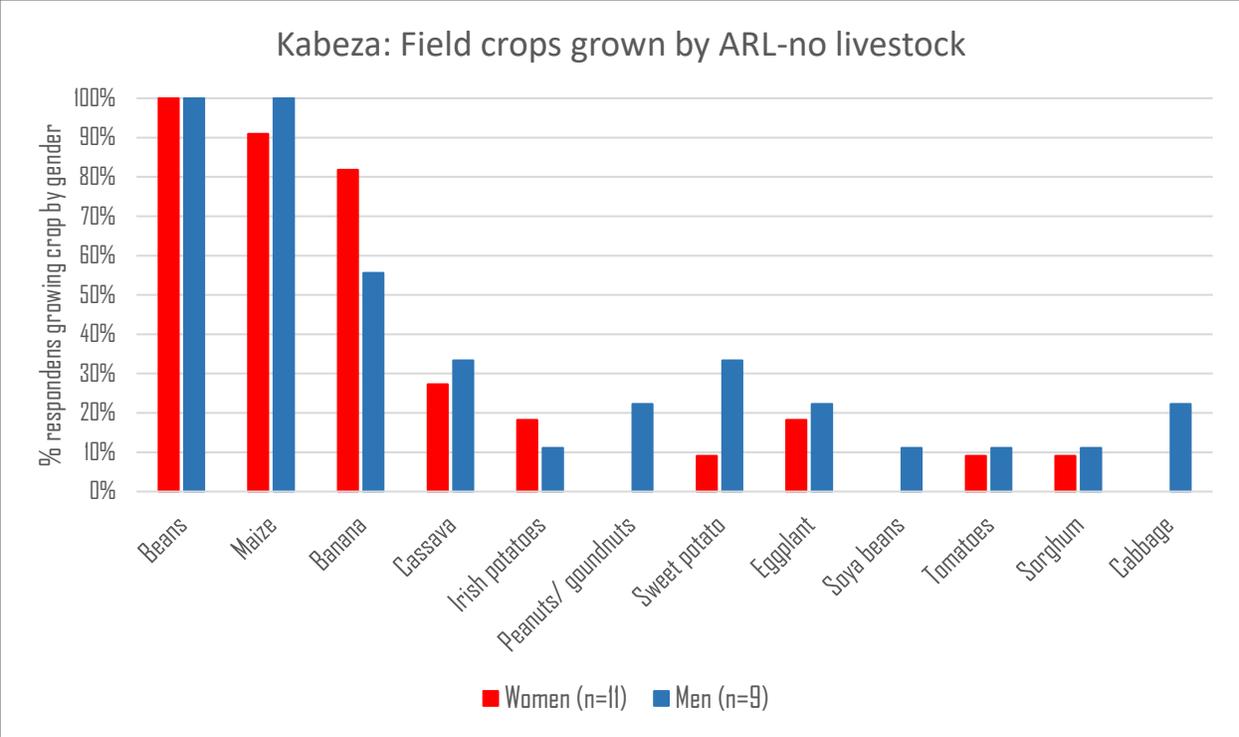


Figure 3.21: ARL-no livestock field crop selection, by gender

Those with ARL-no livestock reported the lowest rate of engagement in gardening of any group, slightly lower than those with ARL. The average ARL-no livestock garden contained 2.1 crops (Figure 3.22). The composition of these gardens, while heavily slanted toward leek and amaranthus production, included a wider range of marketable vegetables than seen among those with ARL, and these were cultivated at somewhat greater rates than in ARL households. Overall, gardening among those with ARL-no livestock is a subsistence activity, though marketing of this production is not unusual.

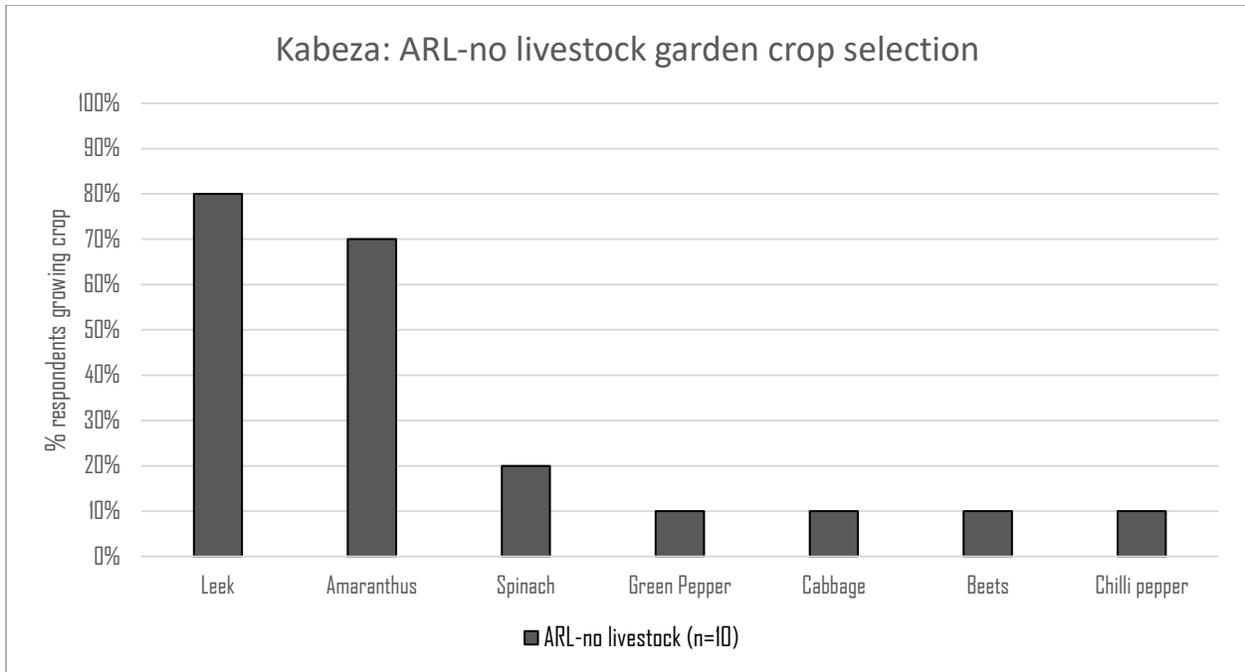


Figure 3.22: Garden crop selection among those with ARL-no livestock

Crop selection among those with ARL-no livestock, as among those with SIL and ARL, was geared towards both household consumption and sale (Figure 3.23). However, this group has less confidence in marketable surpluses, and plants fewer crops with a principle goal of sale. This shift in strategy is shared by men and women, who largely share perceived uses of crops.

	Beans	Maize	Banana	Cassava	Irish Potatoes	Eggplant	Sweet Potato	Tomato	Sorghum	Cabbage
ARL-no livestock men	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat and sell equally		Sell more than eat	Eat all	Sell more than eat		Sell more than eat
ARL-no livestock women	Eat more than sell	Eat more than sell	Eat and sell equally	Eat more than sell	Eat all	Sell more than eat	Eat more than sell		Sell all	

Figure 3.23: Crop uses reported by ARL-no livestock residents, by gender

The shift in agricultural expectations seen in the broad strategy of this group are also manifest in their variety selections. In a pattern similar to that among SIL and ARL respondents, among ARL-no livestock respondents *Coltan* (20.0%) and *Shushya* (55.0%) were the most commonly grown bean varieties. One third of those cultivating *Shushya* consumed all of it, while the remaining two thirds ate more than they sold. Those cultivating *Coltan* sold all of their production, and nearly all *Coltan* cultivators also cultivated *Shushya*. Those with ARL-no livestock had one of the lowest reported rates of *Coltan* cultivation in Kabeza, and while men and women cultivated *Coltan* at very similar rates, this low rate of variety selection suggests maize production among those in this group is less market oriented than in any other vulnerability group. Far more men (88.9%) than women (27.3%) cultivated *Shushya*. Men and women reported the same uses, in the same ratios for *Shushya*, but the wider participation of men relative to women in the cultivation of this subsistence variety, and in

bean cultivation more generally, suggests that men in this group are particularly concerned with ensuring the food security of the household, as opposed to cultivating a marketable crop. Overall, among those with ARL-no livestock, bean production reflects agricultural strategy focused first on achieving subsistence, and then raising income once subsistence was secure.

Gatumane (cultivated by 40.0% of respondents) and *Kanyamumesa* (10.0%) were the most-cultivated maize varieties in this group. Of ARL-no livestock respondents cultivating *Gatumane*, 87.5% reported consuming all or nearly all of the harvest, though one man reported selling as much as he ate. Only two respondents in this vulnerability group, one man and one woman, reported cultivating *Kanyamumesa*. The woman reported eating more than she sold, while the man reported selling more than he ate. While at the group level maize production is focused on subsistence with the marketing of surpluses for cash, within the group men appear slightly more oriented toward the marketing of their maize crops than women.

As with beans and maize, ARL-no livestock respondents reported similar reasons for picking banana varieties. Thirty-five percent of ARL-no livestock respondents reported cultivating *Inyamunyu*, 10.0% *Imbibire*, and 10.0% *Phia*. *Inyamunyu* was largely cultivated for subsistence consumption, with the marketing of surplus relatively common. All *Imbibire* crop was sold at market, while all those cultivating *Phia* reported selling more than they consumed. In this group, men cultivated bananas at a much higher rate than women, but their uses of each variety largely mirrored those of women. The greater participation of men than women in the cultivation of this crop may reflect gendered access to secure land, but overall ARL-no livestock men and women use bananas as a source of subsistence that, when there is a surplus, can bring in some money.

This group is defined by its challenges in accessing livestock, and so it is not surprising that members of this group reported almost no animal ownership (Figure 3.24). The very few members of this group that reported owning animals only reported small animals, with the most substantial holdings belonging to two women who reporting owning a goat.

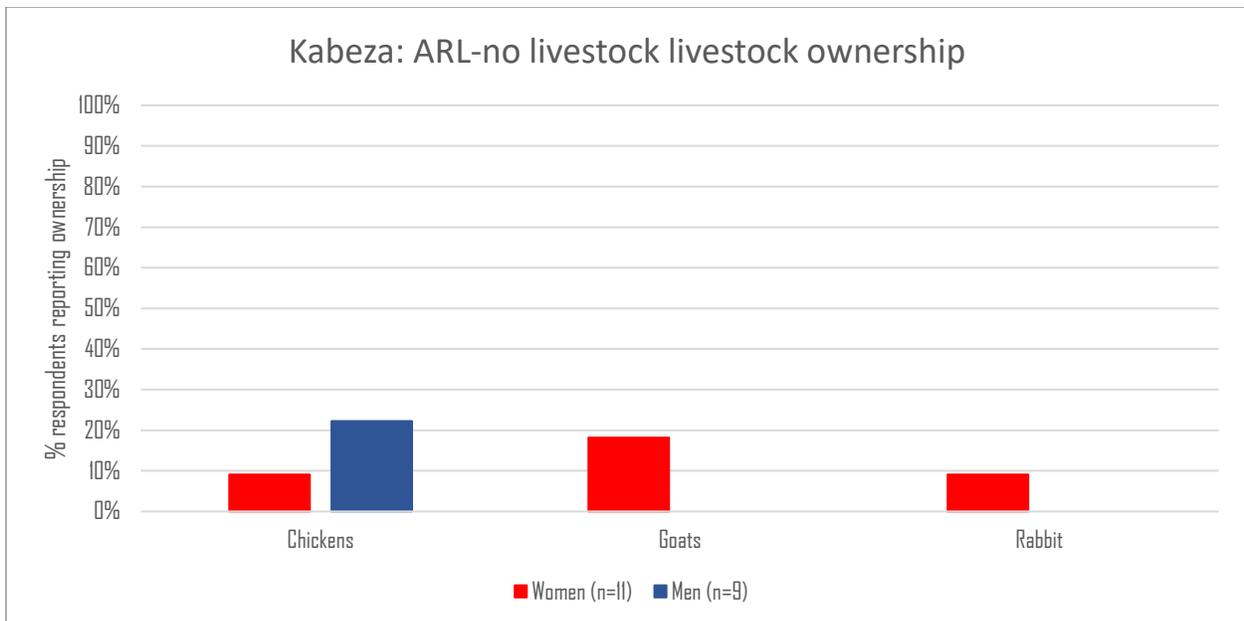


Figure 3.24: Reported livestock ownership for ARL residents of Kabeza

ARL-no livestock respondents appear to have somewhat more diversified, and less defensive, livelihoods than those with ARL. Their field crop production, while slightly less diverse than that of those with ARL, is somewhat market-oriented. While ARL-no livestock men participate in all nonfarm activities more than women, a pattern also seen among those with ARL, this gendered difference in the rate of participation is not as pronounced as in ARL households. All together, these patterns suggest that while men in this group do have concerns for both material need and status, the latter is less stressed, perhaps because the rest of the household has lower expectations of what these men should achieve materially in the context of state safety nets. As a result, men’s status is not threatened by women’s participation in these activities.

3.4.4 Limited Resource Livelihoods

As with respondents in previous vulnerability groups, all those with LRL engaged in agriculture (Figure 3.25). More LRL men than women were engaged in animal husbandry, gardening, and business. Among LRL respondents, only men reported being engaged in day labor while only women (25% of LRL women) were engaged in artisan activities.

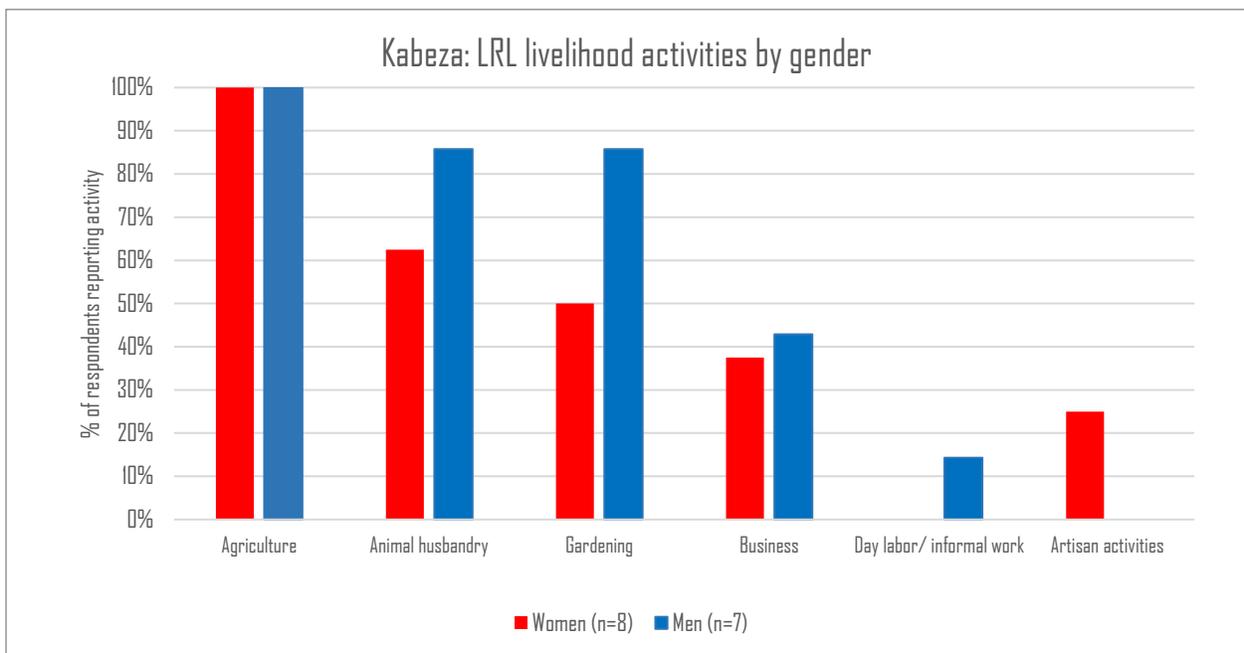


Figure 3.25: Livelihood activities reported by LRL respondents by gender

Those with LRL had the least diverse field crop selections, with men averaging 3.86 crops and women 4.13. This is the only group where women had a larger average number of field crops than men. Rates of banana cultivation were lowest in this group, likely a product of pressure created by insecure land tenure (Figure 3.26). Rates of cassava cultivation were nearly as high as seen among those with ARL. Most women focused on the cultivation of subsistence staples, including cassava. Men shared this focus, with marginally more attention paid to potato cultivation that might be sold. Overall, field crop selection among those with LRL reflects a subsistence-oriented agricultural strategy with little market engagement.

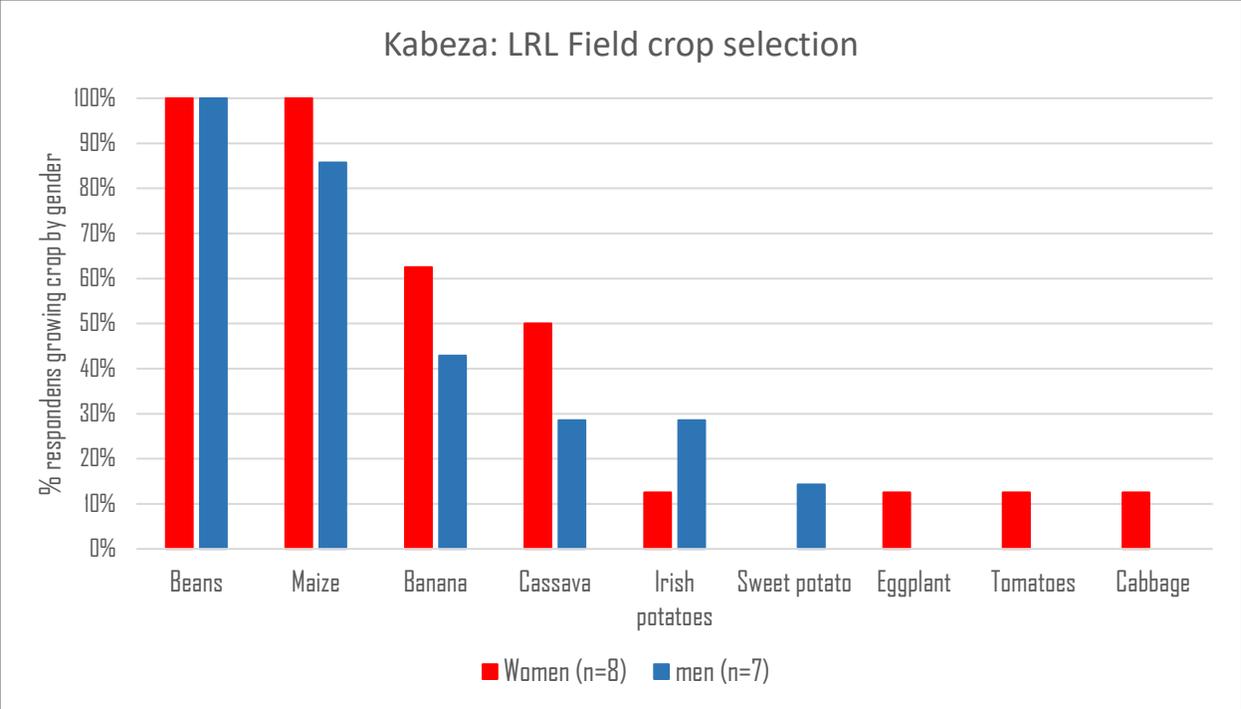


Figure 3.26: LRL field crop selection, by gender

The percentage of LRL respondents who participated in gardening was nearly the same as that among SIL. However, LRL gardens are less diverse than SIL gardens, with the average LRL garden containing 2.1 crops (Figure 3.27). Amaranthus is present in nearly all LRL gardens. Leeks are less common among those with LRL than in any other group, though one farmer was cultivating cassava, a staple, in their garden. On the whole, LRL gardens reflect a desire to achieve subsistence, but their composition allows for more marketing of production than among any group except SIL.

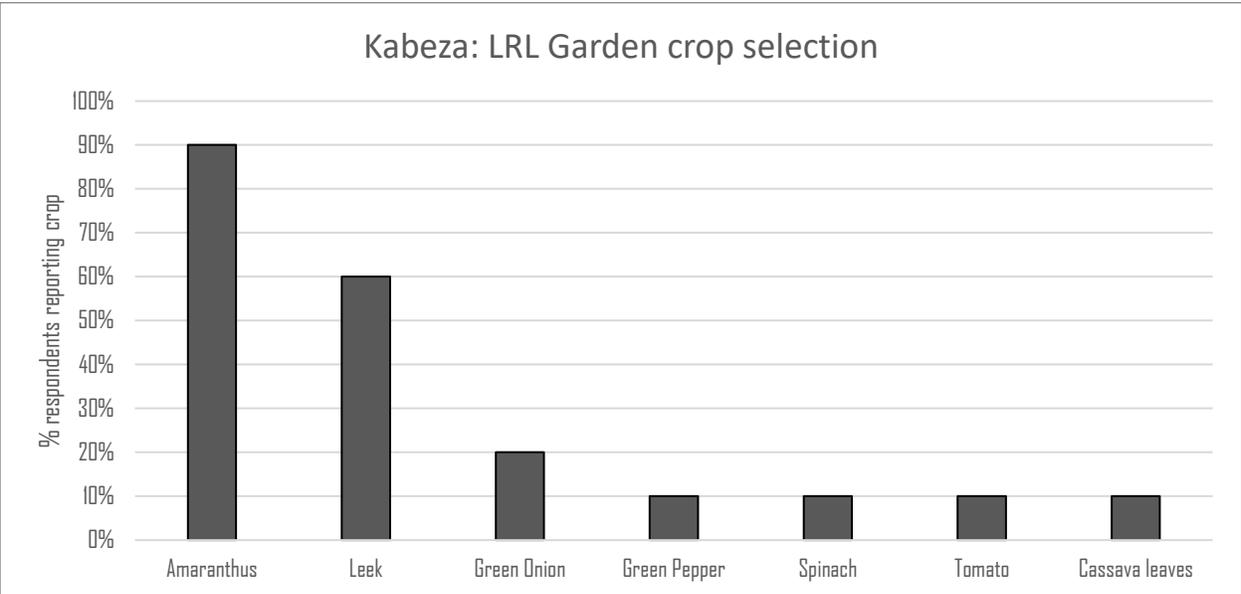


Figure 3.27: Garden crop selection among those with LRL

Crop and crop variety selection among those with LRL was similar to those in other vulnerability groups in that it was geared towards both household consumption and sale (Figure 3.28). LRL residents were somewhat more market-oriented than those with ARL-no livestock, though men in this group appear less confident in marketable surpluses of key staples maize and beans. Men are also cultivating fewer crops explicitly for sale, and members of this group overall are cultivating fewer crops than the other groups.

		Reported crop uses: LRL								
		Beans	Maize	Banana	Cassava	Irish Potatoes	Eggplant	Sweet Potato	Tomato	Cabbage
LRL men		Eat more than sell	Eat more than sell	Sell more than eat	Eat and sell equally			Eat all		
LRL women		Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat and sell equally	Sell all	Sell more than eat		Sell more than eat	Sell more than eat

Figure 3.28: Crop uses reported by LRL residents, by gender

The situation of those with LRL is also reflected in their variety selections. *Coltan* (cultivated by 20.0% of LRL respondents) and *Shushya* (46.7%) were the most commonly cultivated bean varieties. All respondents cultivating *Coltan* sold all of their harvest, but as among those with ARL-no livestock, the rate of *Coltan* cultivation in this group was very low. Of those cultivating *Shushya*, 71.4% ate all of their harvest while the rest ate more than they sold. In this group, men cultivated *Coltan* at twice the rate of women (though at very low rates overall), but also reported eating all of their *Shushya* harvest at nearly twice the rate of women. In this group, then, it appears that men and women balanced subsistence and income needs in different ways. Men cultivated one variety for income, and one for subsistence. Women cultivated only one variety, but marketed any surplus of that variety for income.

As in other vulnerability groups, *Gatumane* (cultivated by 40.0% of respondents) and *Kanyamumesa* (26.7%) were the most cultivated maize varieties. *Gatumane* production appears to be slanted toward subsistence, with most cultivators reporting consuming all of the crop, or more than they marketed. However, 75% of women cultivating this variety did so with an emphasis on subsistence, while all men cultivating it consumed and sold it in equal measure. Similarly, *Kanyamumesa* cultivation was aimed more at subsistence than sale, with men and women reporting the same uses. This pattern of use is different than seen in other groups, in that there is no significant component of maize production, whether by men or by women, that is principally aimed at marketing. This suggests that those with LRL have difficulty meeting their food needs with their own production, and therefore have few marketable surpluses or the excess land and labor needed to cultivate varieties specifically for market sale.

Among farmers with LRL, 40% cultivated *Inyamunyu* bananas, 13.3% *Phia*, and 6.7% *Imbibire*. The reported uses of these varieties is very similar to that seen among ARL respondents, with very similar patterns of use among men and women. Overall, bananas are a less important crop to those with LRL than to members of any other group, and when they are cultivated they largely serve as a source of subsistence, rather than income. The low rates of cultivation in this group are likely tied to the significant challenges these residents face in accessing adequate secure land for cultivation.

LRL men and women were the most likely of any group to rely on the sale of animals to manage household emergencies as well as to purchase agricultural inputs including fertilizer and seed. This reflects the lack of additional sources of cash or savings within LRL households with which to purchase agricultural inputs or deal with household emergencies. LRL men had the highest rates engagement in gardening among men across all four vulnerability groups, continuing a pattern of increasing men’s engagement as their vulnerabilities increased and other opportunities failed to present themselves.

Those with LRL reported some of the highest rates of animal ownership in the community (Figure 3.29). Members of this group were most likely to own goats. A few members of this group reported owning cows or oxen. These high rates of animal ownership can be partially attributed to government assistance.

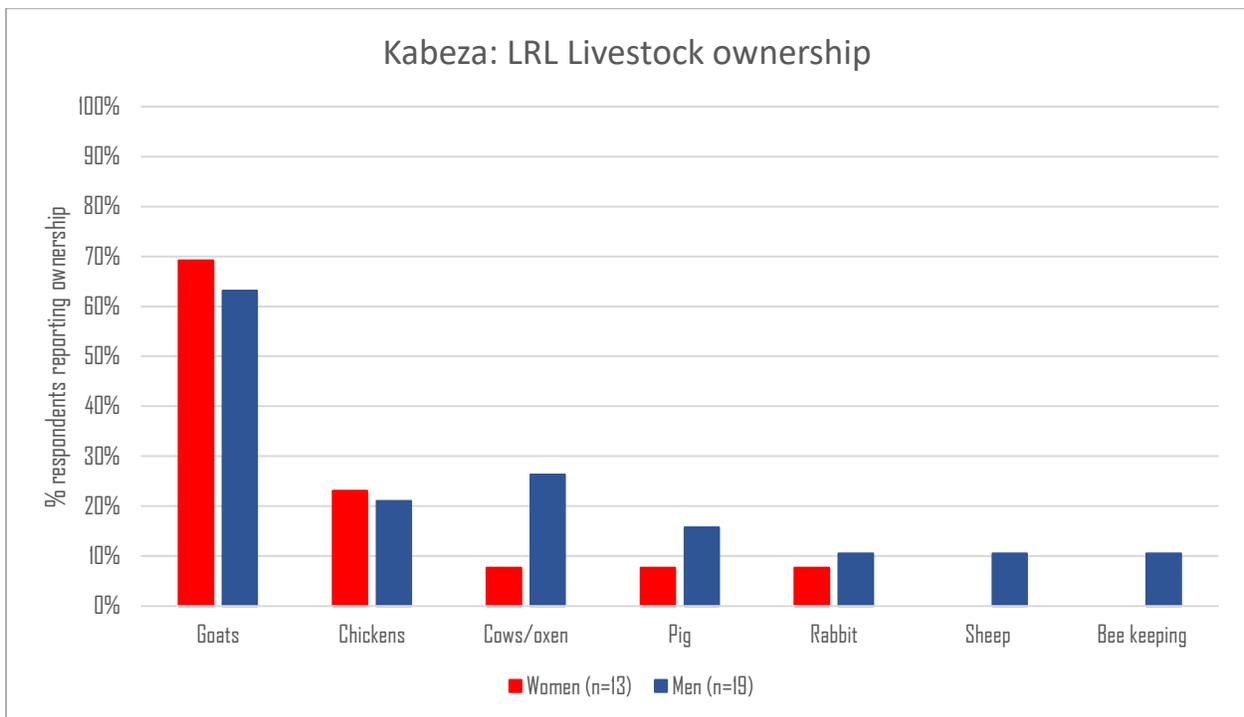


Figure 3.29: Reported livestock ownership for LRL residents of Kabeza

Forty-three percent of LRL men and 38% of LRL women engaged in business activities. Patterns of engagement in business in this vulnerability group also mirrored those with ARL-no livestock, with more men than women participating. However, the differences in the rates of engagement for LRL men and women were much narrower than those among ARL and ARL-no livestock men and women but were similar to the rates of engagement among SIL respondents. These patterns of engagement in business for LRL respondents reflects a lack of financial resources in the household. Without the resources to maximize agricultural production, they were not able to invest in additional activities secondary to the agricultural core of their livelihoods.

Those in this group have the fewest assets, whether land, animals, or labor, with which to meet their material needs in this community. They cultivate the fewest field crops, and focus that production almost entirely on subsistence. Their outcomes from their activities are insecure, as reflected in their relatively high rates of cassava cultivation, their lower rates of banana cultivation (closely linked to

their land tenure challenges), and the near-absence of cash crops on their farms. While they participate in gardening at high rates, this garden production, like their field crops, is focused on subsistence first, with relatively little marketing. Those with LRL own animals, but these are mostly goats, with little to no ownership of more valuable animals like cows and oxen.

3.5 The use of agroecological information across vulnerability groups in Kabeza

With the exception of one farmer, all respondents across the four vulnerability groups relied on a combination of personal experience, on agricultural advice provided by experts, observation of local indicators, information from other farmers, and information from the radio (Figure 3.30). Just over 81% of respondents (n=71) reported relying on their own experience to establish the onset of the season as well as which variety to plant.

Farmers were more likely to rely on personal experience to gauge the onset of the season rather than to select a variety to plant. In addition, they were more likely to rely on their own experience when it came to staple crops, but not cash crops such as coffee and soybeans. While farmers did not comment on this variable use of their own experience, it is worth noting that coffee and soybeans have agricultural agents who are often quite engaged with rural producers and can provide a great deal of advice. Across Kabeza, 71.2% (n=62) farmers reported that they took into consideration advice from agricultural experts including extension agronomists, agricultural board agents or promoters, and local authorities when making agricultural decisions. Expert advice was disseminated through one on one meetings or through “*Umuganda*” community meetings (the PICSA process). Further, 60.9% of residents (n=53) reported relying on local indicators, particularly to predict the onset of the season and when to plant. This is a smaller proportion than those who reported relying on personal experience or on agricultural advisors. Fifty four percent (n=47) residents reported receiving information from other farmers or were likely to copy what other farmers were doing. The smallest category of residents were those who reported using advisories given over the radio. Only 17.2% (n=15) reported using such information when making decisions about their agricultural activities.

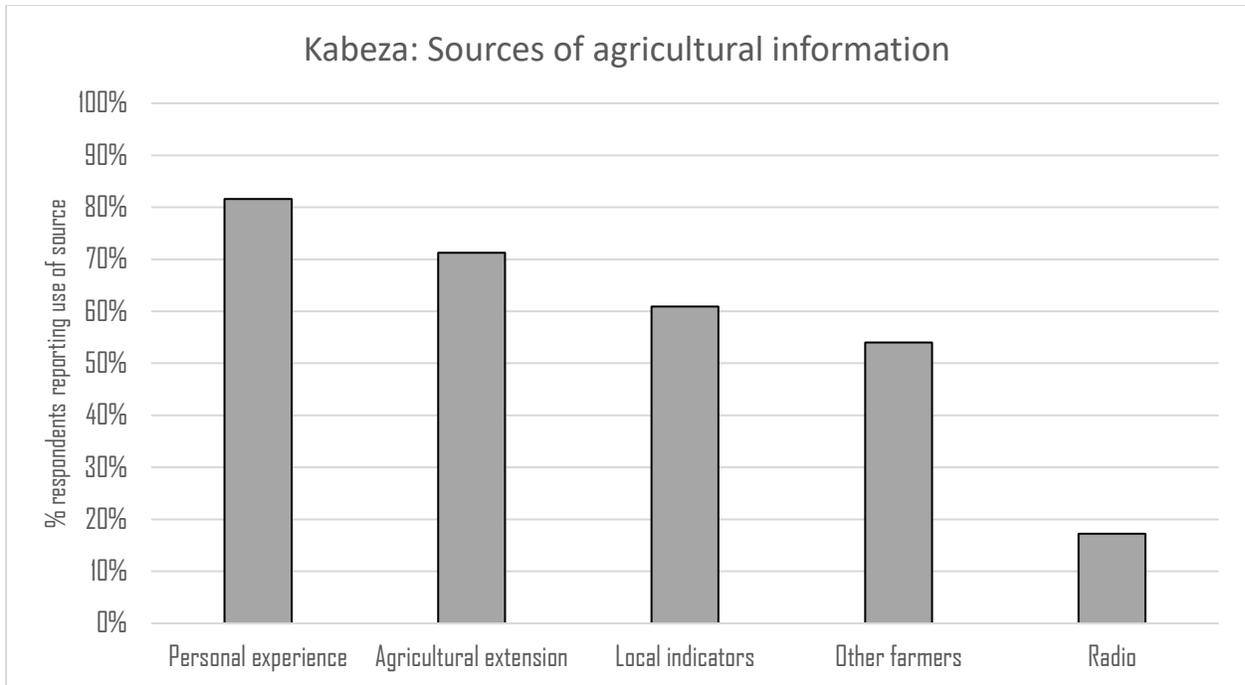


Figure 3.30: The sources of information residents of Kabeza reported using to inform their agricultural decisions

The reported use of information varied by vulnerability group (Figure 3.31). SIL respondents reported the highest rates of engagement with agricultural extension, and the lowest use of local indicators. Both ARL and ARL-no livestock respondents reported a reliance on personal experience, but engaged with extension, local indicators, and other farmers at very similar rates. LRL respondents reported similar rates of engagement with extension and local indicators, but overall had the lowest reported rates of use for all sources of information. These patterns suggest that formal agricultural information, such as is delivered via extension or radio updates, aligns more readily with the goals of the wealthiest and most secure farmers in this community. These are the farmers whose food security is largely ensured, and who are seeking to produce marketable surpluses. At the other end of the spectrum, the low rates of engagement with such formal advice by LRL respondents suggests that this information is not as useful in achieving the largely defensive goals of agricultural strategy in this group. The mixing of local and formal knowledge by the two ARL groups suggests individuals attempting to move from more defensive situations, such as those seen in LRL households, toward the secure situations of SIL households. Tracking ARL and ARL-no livestock households over time might show if PICSA information helps them make this shift into more secure situations.

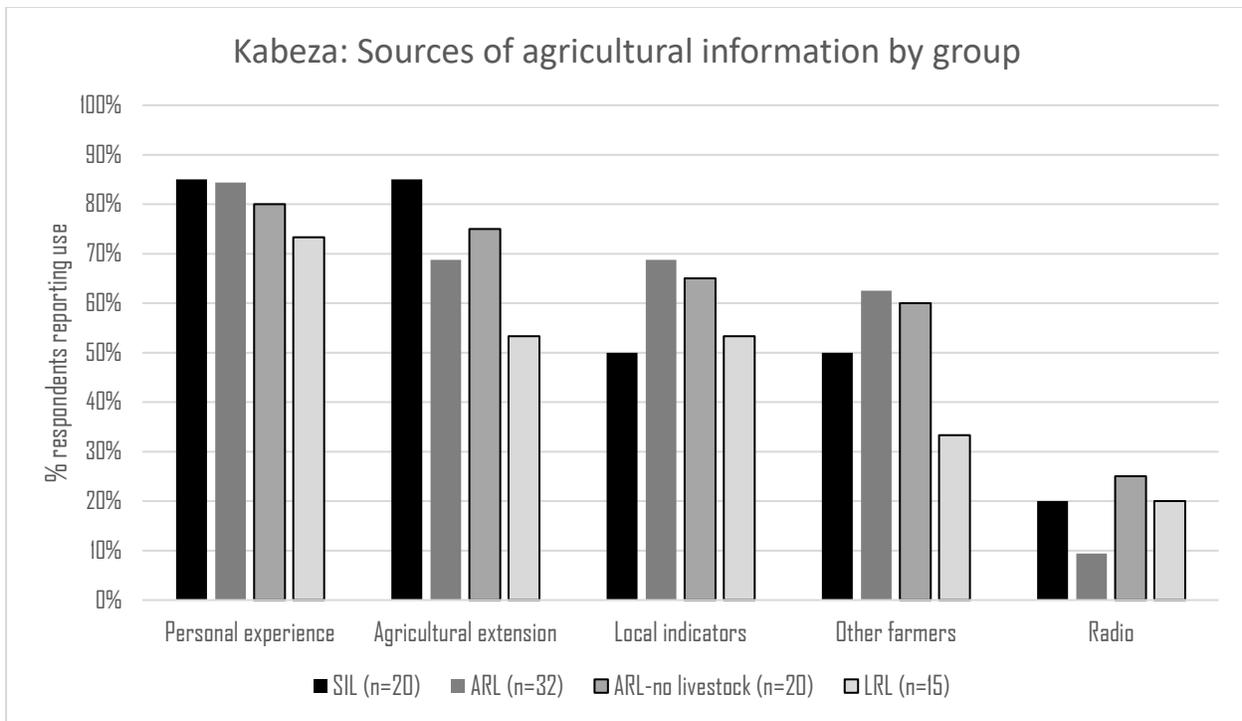


Figure 3.31: Reported sources of information used by respondents to inform agricultural decisions by vulnerability group in Kabeza

The gendered patterns of information use varied across groups. Among SIL respondents, there were minor gendered differences in the use of different information sources (Figure 3.32). Women were slightly more likely than men to report the use of personal experience or consultation with other farmers as a source of information. For SIL men, extension was the most common source of information reported. This is the only group of men in the community to place this emphasis on extension, and such a low emphasis on local indicators and other farmers. This strongly suggests that extension and perhaps PICS activities are reaching these men. This information was utilized for most crops grown by these men.

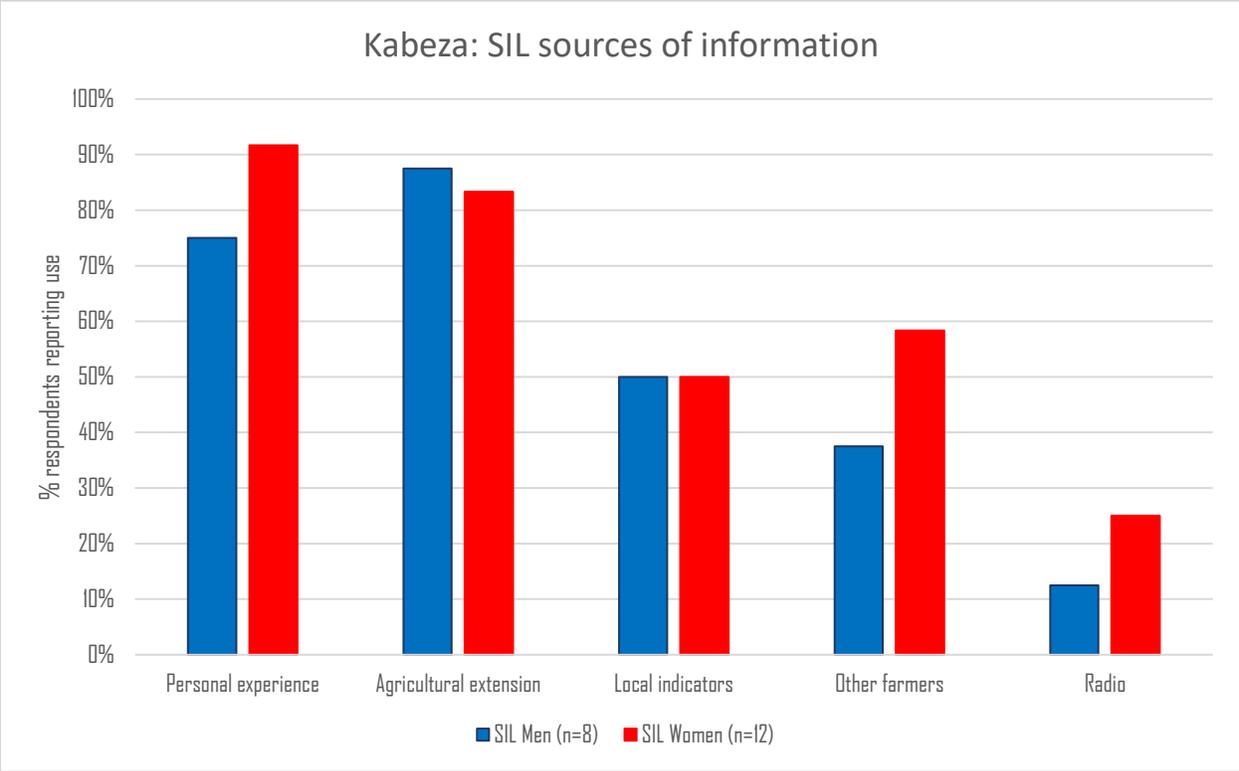


Figure 3.32: Reported sources of information by SIL respondents in Kabeza

ARL respondents also showed gendered patterns (Figure 3.33). ARL women relied most heavily on their own experience and local indicators for their decisions. ARL men, as seen with ARL-no livestock men, employ personal experience, extension, local indicators, and other farmers nearly equally. However, men in this group rely more heavily on the advice of other farmers in the area than their ARL-no livestock counterparts, and more than twice as frequently as men with SIL. It is interesting that the men in this group appear to rely slightly more heavily on the advice of others than their own experience, suggesting a degree of uncertainty about the validity of their own experiences in making future agricultural decisions. Like their SIL counterparts the information was utilized for starches grown by respondents.

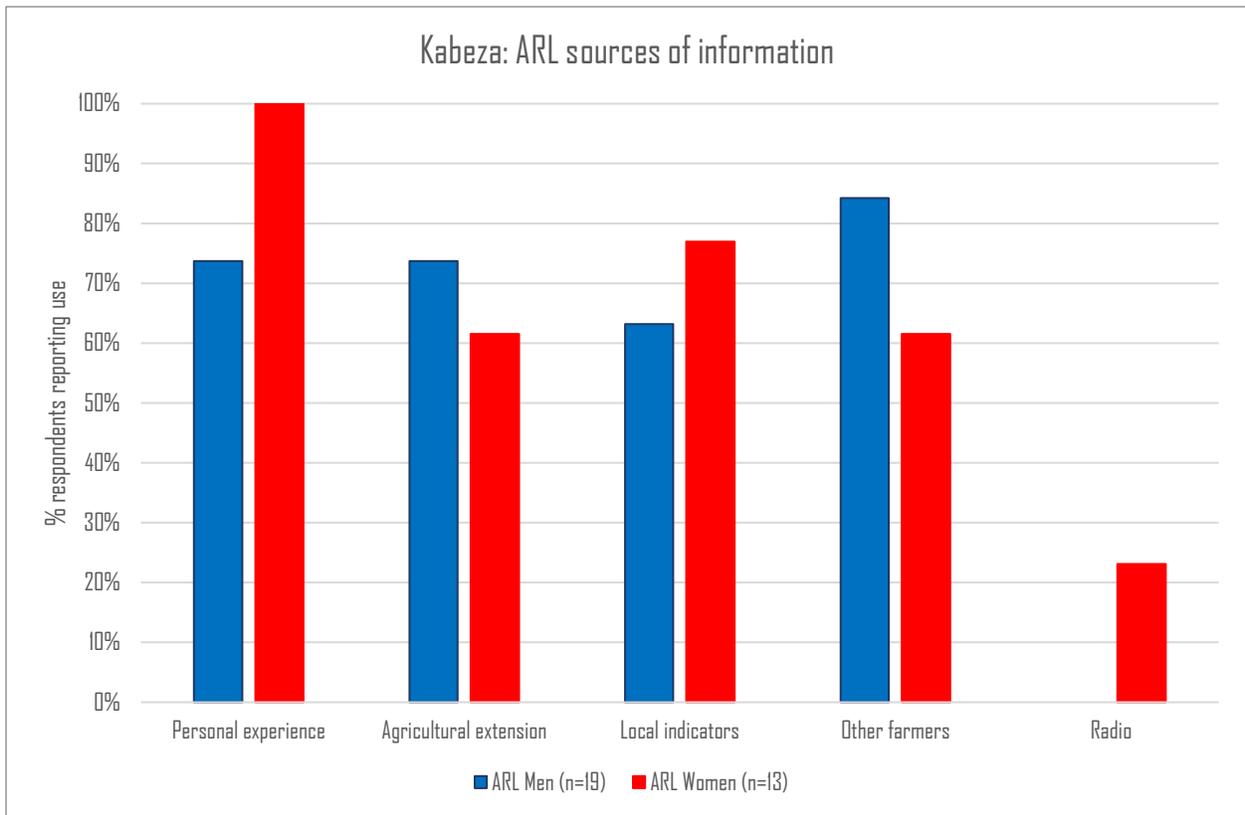


Figure 3.33: Reported sources of information by ARL respondents

Among ARL-no livestock respondents, there were much clearer gendered patterns of information use (Figure 3.34). All women in this group reported using personal experience and agricultural extension, weighing both sources of information. This suggests, similar to SIL men, that extension and perhaps PICSA activities are effectively reaching these women. Men, on the other hand, appear to use personal experience, extension, local indicators, and other farmers nearly equally, suggesting significant hedging of information and perhaps less trust in extension information than seen among SIL men.

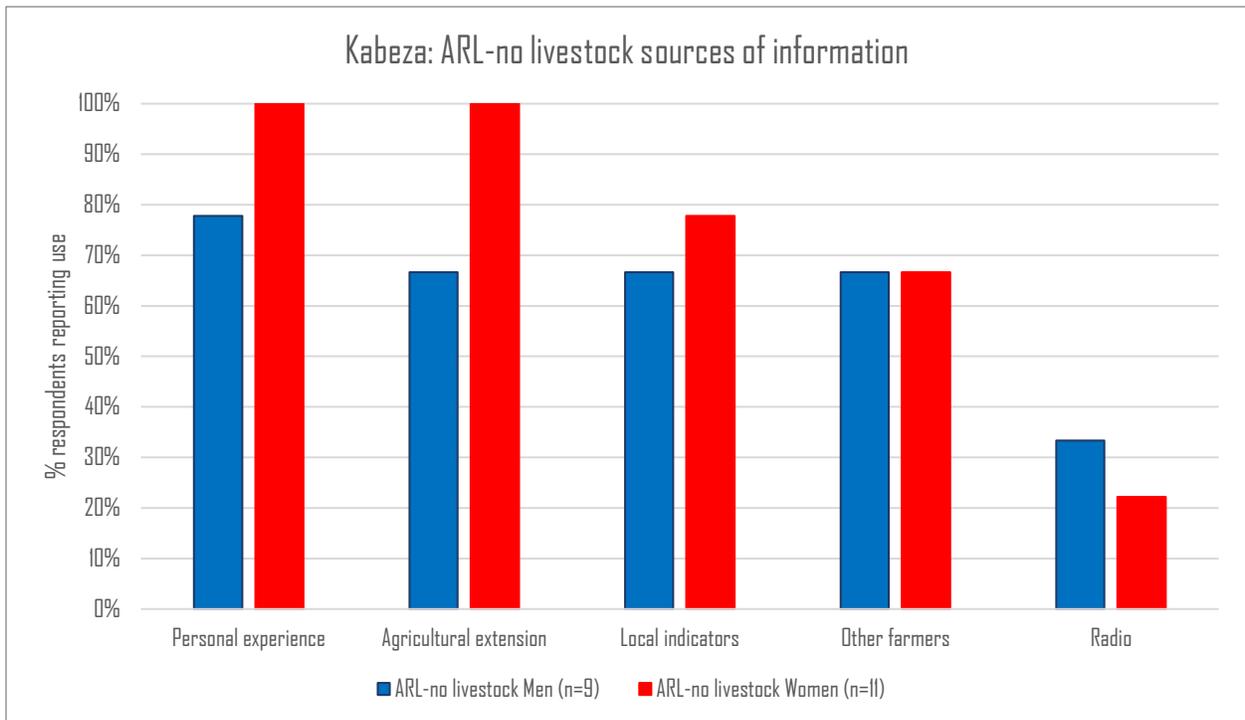


Figure 3.34: Reported sources of information by ARL-no livestock respondents

LRL respondents reported the lowest rates of utilization of personal experience, extension, and other farmers when making agricultural decisions, and the second-lowest rates of utilization for local indicators and radio (Fig 11). There are very clear gendered patterns in this group (Figure 3.35). Women have a much higher rate of engagement with extension, on par with their use of personal experience, and much more frequently than their use of local indicators and the advice of other farmers. Men, on the other hand, appear to be largely disengaged from extension, relying most heavily on personal experience and local indicators. It is interesting that these men appear to have relatively little faith in the advice of others, though this may reflect their social networks and ability to access advice from more successful farmers in the community. These sources of information were utilized across all starches grown by respondents.

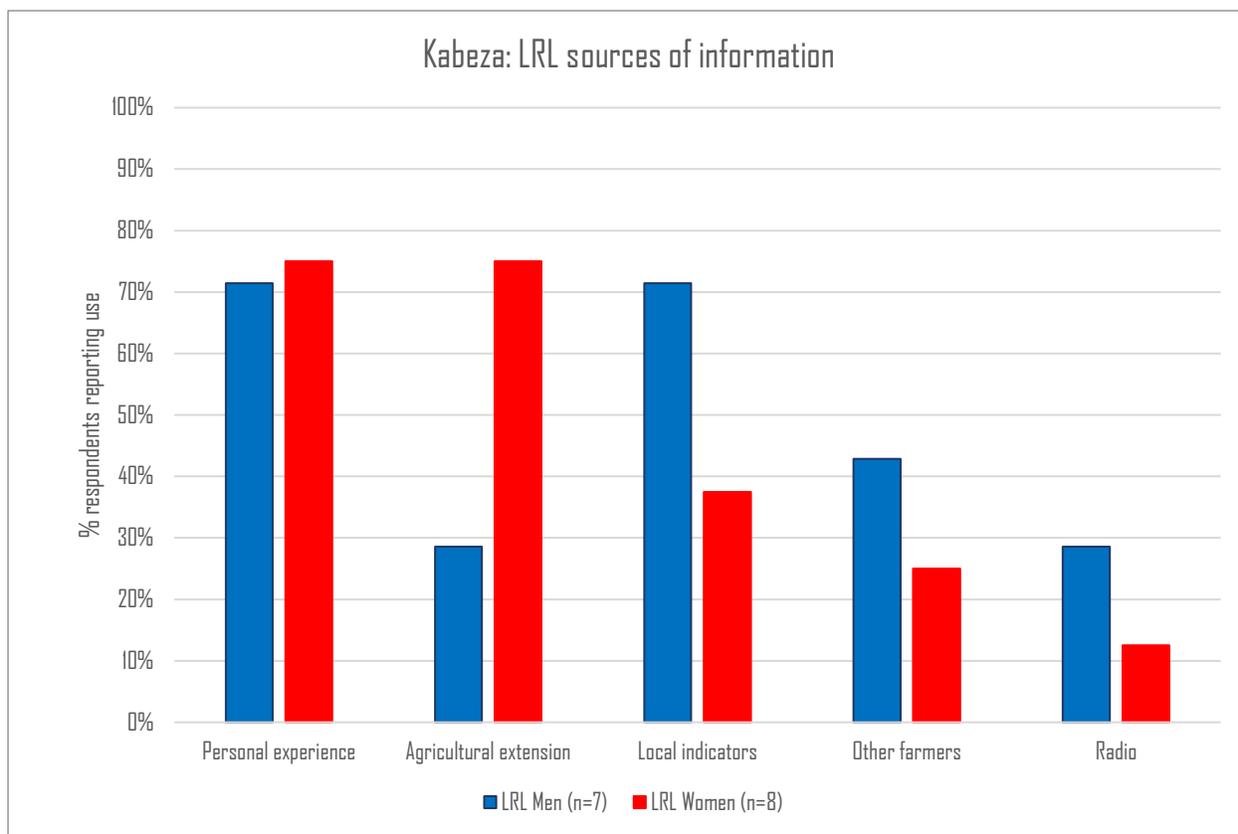


Figure 3.35: Reported sources of information by LRL respondents

Overall, women report greater engagement with extension and formal sources of agricultural information than do men. However, this difference becomes more pronounced as the overall security of the individual declines. While women engage with formal information at relatively consistent rates across groups, men’s engagement appears to be inversely related to their security. SIL men were heavily engaged with formal information, and less engaged with traditional, local sources of information. LRL men, at the other end of the spectrum, appear to largely reject extension information in favor of tradition and local sources of information. Although there are gendered patterns with the preferences of sources of information. We found no gendered patterns for the use of information by particular crops.

3.6 Tools of coercion in Kabeza

The intersection of roles and responsibilities with the expected conduct of livelihood activities and decision making creates compelling expectations for individuals. These expectations operated as social facts – often-unquestioned framings of the validity, boundaries and possibilities of peoples’ behaviors in relation to livelihood resources use and activities (Carr, 2013). These social facts are often so compelling that some respondents cannot imagine a situation where a household member would disagree with decisions that were made in their household or community. For example, when asked what sorts of sanctions could be imposed on household members if they refused to obey decisions made by the head of household, a 53-year-old man replied that “It would not happen I think” and was not able to further articulate what course of action he would be able to take simply

stating “I don’t know” (KA78). Another respondent, a 54-year-old woman (KA59), explained she would never go against decisions made in the household. “It wouldn’t happen because I respect him, [he] is my husband and even I don’t have his children, I don’t want conflict between us.” However, these expectations were not enough to completely ensure compliance with expectations by all members of the community. For example, it is clear that men have most of the decision-making authority in their households, and women do not always agree with these decisions, nor do they always benefit from them. Tools of coercion, locally legitimate means of reinforcing social facts by rewarding or censuring community members, were important for regulating behavior and enforcing expected behavior. To better understand patterns of livelihoods decision-making observed in Kabeza, we examined which tools of coercion exist for the reinforcement of particular behaviors, and who has the power and authority to sanction other community members.

There was agreement among most community members about what social sanctions can be used to discipline the behavior of community and household members. Men who failed to meet their responsibilities were disliked by other community members. As a 40-year-old woman said, “For a bad husband people take him like the one who doesn’t contribute to the prosperity of community.” The interviews show that failure, which was defined as much as a function of their countenance within the home as it is issues with providing for their families materially, was most broadly defined as not meeting their obligations. Across the community, living in a peaceful and tranquil home was particularly valued. Those who acted in any way to bring discord and chaos into the home were considered a liability both by household members and the community. For example, when discussing the expectation that she be an obedient wife who accepted the decisions of her husband, a 62-year-old woman (KA05) said “If I was tried to ignore these decision, it will create conflict with him and I don’t like it.”

Men’s behavior within their household was sanctioned not within the home but by the community, suggesting that women had little authority to discipline their husbands, even when these men were not meeting widely-held expectations. At the community level, however, there were significant sanctions for men who failed to live up to their roles or meet their responsibilities. In general, these men were not extended the trust accorded to other men within the community. A 28-year-old woman explained that “society views [a bad husband] like a wrong man who always creates conflicts at his home and they don’t trust him. Their home is not respected by people in society and they consider them like the ones staying in conflicts not peace makers” (Interview KA18). Men who were abusive towards household members were feared within the community and dismissed as unserious men, incapable of leading in their home. One respondent went as far as to describe these men as evil: “The society view him as evil man who like beating his wife and kids who fear him because he seems like an animal in front of them” (KA25, a 38-year-old man). Because such men disrupted both households and the wider community, when issues arose they were asked to attend a community meeting where their bad behavior was discussed in public, and where they were advised to adjust their behavior. If the man did not change his behavior then he was reported to the authorities, which in Rwanda can result in arrest and significant punishment. Older men who did not meet their responsibilities were considered as not making any contribution of value to the community and were rarely asked for advice. But apart from this threat of social isolation, respondents indicated that these men rarely faced any additional sanctions.

Although many respondents suggested that household decisions about livelihoods were made jointly by men and women, when discussing how sanctions are applied at the household level it became clear that men, in their role as heads of households, had more power and authority than women. For

instance, a 68-year-old man explained that “if someone tries to ignore the decisions that were made there will be quarrels and disputes in the house because they are not supposed to contradict the head of the family. When [the head of household] decides something, it must be followed as it is” (Interview KA76). Further, unlike men, women’s behavior was sanctioned both within the home by husbands or adult children, as well as in the community, reflecting men’s authority over women in the community more broadly. Several escalating sanctions were employed against women who disputed decisions made for the households. A 70-year-old male respondent explained: “If my wife tr[ies] to ignore or contradict my decision there will be domestic dispute, there is no sanction but sometimes we can spend days without talking to each other” (Interview KA18). Women could also be called to a family reconciliation meeting where they were asked to provide an explanation for failing to follow decisions that had been made. Women also admit that men use physical violence if wives contradict jointly-made decisions. As one 45-year-old woman (Interview KA37) said, “If I tried to ignore or contradict these decisions it can create conflict between us and he can even beat me.” One older woman who relied on remittances from family members indicated that she was compelled to follow decisions made by her child. If she ignored these decisions she risked losing her remittances (KA50). More broadly, not meeting one’s responsibilities was seen as disrespectful to the community and women who were not fulfilling their responsibilities within their home were socially isolated as a way of containing the bad behavior. They were seen as setting a bad example for their children through their bad attitude. As a result, other women within the community did not allow their children to socialize with those of the woman in question. It is important to note, however, that the social facts which emerge through the mobilization of identity through discourses of livelihoods were powerful and naturalized such that the use of these tools was nearly nonexistent. For example, as great value was placed on having a harmonious and peaceful home, some respondents had difficulty imagining a situation where once decisions were made a member of the household would dissent. The guilt of being the source of quarrels and disputes within the home was, in itself, often enough to get the dissenting woman to reconsider.

3.7 Assemblages of Vulnerability and the Logic of Livelihoods in Kabeza

Having laid out the decision-making structure and patterns of activity that mark livelihoods in Kabeza, we can now apply this information to the interpretation of the assemblages of vulnerability associated with each group in the village. By laying out and explaining the patterns of reported vulnerability within these different groups, we can explain how the logic of livelihoods plays out in that group.

3.7.1 Stable Income Livelihoods

The most-commonly reported stressors in this group, such as drought, crop pests, long dry season, and crop disease, all reflect the heavy dependence of this group on agriculture for their livelihoods (Figure 3.36). While they are secure in their subsistence and, to a degree, in their income, their livelihoods are not highly diversified and therefore more vulnerable to market and weather shocks that might disrupt agricultural production. However, those with SIL in general report lower rates of concern for drought than any other group, and much lower rates of concern than, for example, those with ARL. This reflects the fact that those with SIL have the income and assets on hand to sell and manage most expected shocks, including this sort of stress on agricultural production. Where there are gendered divergences in reported vulnerabilities, they reflect the different roles within activities, as well as the different engagement men and women have in gardening. Women’s greater concerns for water shortage, crop disease, insufficient seeds, and potential loss of access to

marshlands all relate to the fact that they participate both in rainfed agriculture and in gardening as important means by which they meet their responsibilities to the subsistence of the household. Men's greater concerns for manure speaks to their ability to prepare family fields to ensure expected yields. However, most of their other concerns are less existential than reflections of the ways in which they feel they are constrained in growing their incomes and assets, as opposed to meeting subsistence goals. For example, the concern for fodder is, to an extent, a luxury of the relatively wealthy in that they have enough animals that feeding them can become a challenge. This framing of challenges is also visible the ways in which men with SIL feel they are restrained by the state. They feel constrained in what they can plant, an issue that resonates strongly for them as principle decision-makers in agriculture-centered households. Their concerns for taxes also speak to these constraints on their incomes and investments, but again are an outcome of the relatively wealthy in that they own enough land to attract appreciable taxation. Even their concern for access to land is not an issue of inadequate land to meet subsistence needs, but difficulty in finding land onto which they might expand production and therefore grow their incomes.

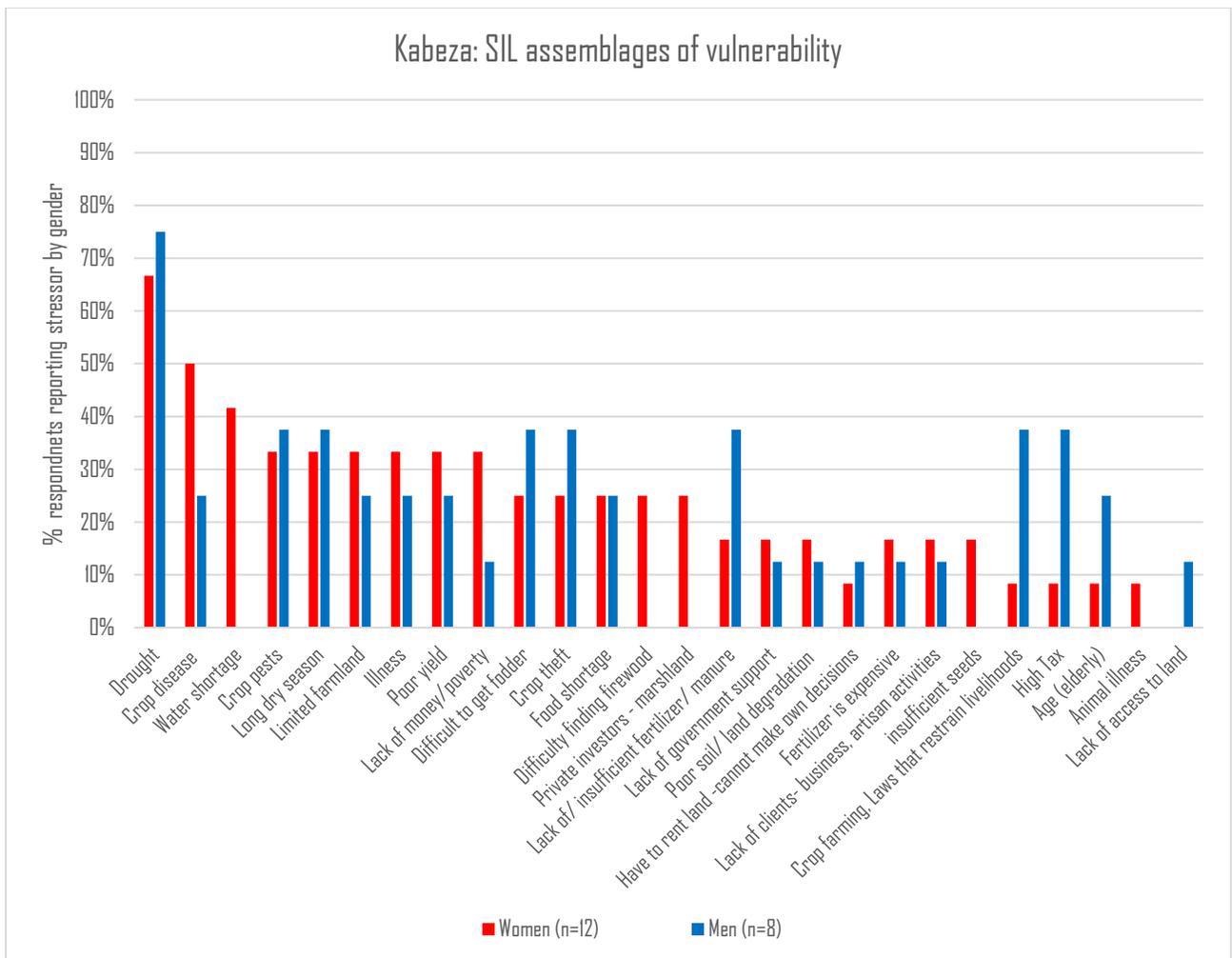


Figure 3.36: Livelihood concerns for SIL respondents by gender

In summary, the assemblage of vulnerability reported by those with SIL, and the gendered patterns within that assemblage, reflect a group of residents very secure in their incomes and food supplies, heavily focused on agriculture for their livelihoods, and looking for ways to further expand their

incomes. Men and women in this group are relatively secure in their roles and meeting their responsibilities.

3.7.2 Adequate Resource Livelihoods

Among those with ARL, the most reported shocks and stressors were drought, limited access to farmland, illness, and difficulty finding firewood (Figure 3.37). The concern for illness speaks to households that do not have extensive resources with which to manage shocks, as illness both produces costs to be managed and can take labor and therefore income and food from the household. Seen in this light, the concern over access to land suggests households seeking greater resources to ensure their security, as opposed to those with SIL who were seeking to increase their incomes. Further, the concern for drought in this group is much higher than reported by those with SIL because members have fewer resources with which to manage this agricultural stressor. In short, the overall assemblage of vulnerability for ARL reflects households that are not yet secure in their income and food supply, but able to manage most shocks and stressors with the resources they have at hand.

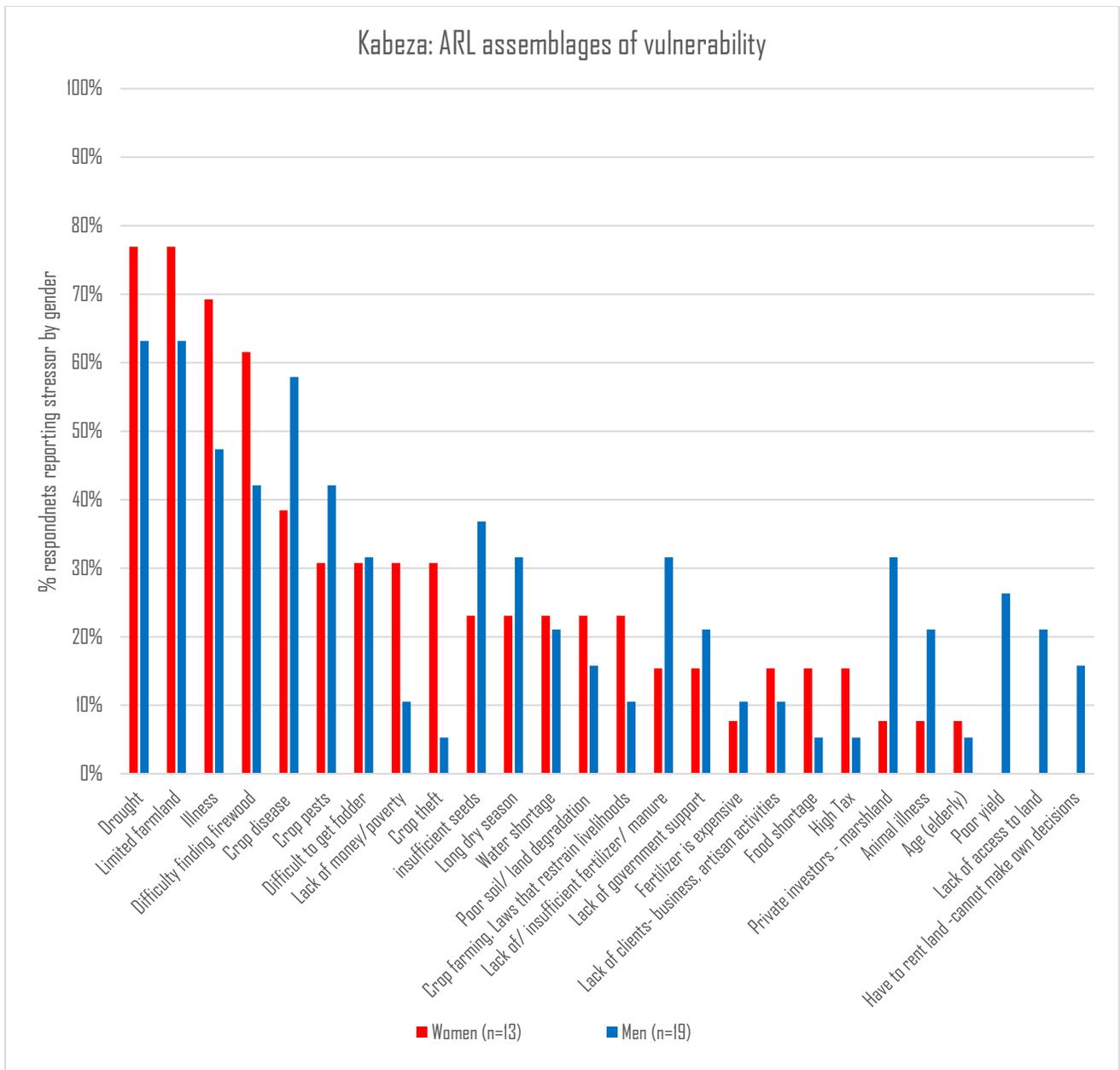


Figure 3.37: Livelihood concerns for ARL respondents by gender

Among those with ARL, men’s concerns are centered on stressors that have an impact on crop production. These included crop disease and crop pests, insufficient access to inputs including seeds and fertilizer, the inability to make their own decisions when renting land, and lack of access to land. This reflects men’s responsibility to oversee rainfed agricultural production and perhaps their greater rate of participation in gardening, all in the context of constrained resources and mildly insecure livelihoods outcomes. ARL men were also concerned about private investors in marshland and animal illness, reflecting their greater rates of animal ownership and participation in gardening. On the whole, however, ARL men reported very low rates of concern for adequate yields or income. This suggests that these men were confident in their ability to meet expectations around these two outcomes, even if meeting these expectations still left their households somewhat vulnerable to shortages. This would explain why women reported concern for both income and yields at a higher

rate than men in this group. Women with ARL stressed crop theft and lack of money, and exhibited higher rates of concern for most stressors to rainfed production than men. All of these stressors reflect a concern for meeting the needs of the household with limited resources and the relative lack of control women have over the resources that are available to meet those needs. They also worried about finding adequate firewood, which speaks to their role in the domestic sphere of the household, and the limited resources on hand with which to meet that role and its associated responsibilities.

In summary, the assemblage of vulnerability reported by those with ARL, and the gendered patterns within that assemblage, reflect a group of residents on the verge of security, but still subject to large shocks and stressors that they cannot yet manage with the resources at hand. Their livelihoods are somewhat more diversified than under SIL both to manage the risks associated with rainfed agricultural production and to generate the income and resources necessary to achieve SIL status. There is evidence in this group that the insecurity of livelihoods is manifest in gendered livelihoods roles, where men have taken on income-generating activities at greater rates than women first to ensure the material well-being of the household, but also to ensure that their role as provider is not compromised, especially when encountering large shocks and stressors.

3.7.3 Adequate Resource Livelihoods – no livestock

While the name of this group might suggest that the only real difference between its members and those with ARL is the emphasis on livestock ownership, participation in this component of livelihoods and access to animal resources produces very different assemblages of vulnerability between these two groups (Figure 3.38). On one hand, they share similar rates of concern for drought and access to farmland and firewood. On the other, those with ARL-no livestock are more concerned about crop disease, crop theft, poor yield, and access to inputs. This suggests a group much more reliant on agriculture, and therefore much more sensitive to these shocks and stressors. At the same time, they are much less concerned about illness than those with ARL, perhaps because they are, on one hand, further from SIL status while at the same time have much greater security than those with LRL, so illness might not prevent them from achieving a goal and also might not result in destitution. It is interesting that those with ARL-no livestock cultivate cassava, the hardy defensive staple, less frequently than do their ARL counterparts, or indeed any group in the village, and that they cultivate a somewhat wider range of cash crops than seen among those with ARL. This does not suggest that these households are more secure than those with ARL, but that they are securing something different: they are somewhat confident in their ability to secure their material needs, but are not yet close to achieving a shift in their overall condition to SIL, and thus have less to defend against the wide range of shocks and stressors in the community. This broad assemblage hints at a group of people that are less secure than their ARL counterparts, but still relatively secure from disaster. To understand this particular framing of livelihoods requires a consideration of state engagement in agrarian settings. Where the Rwandan state exerts a degree of control over the crops planted and activities undertaken in rural communities, it also provides a safety net that serves to prevent destitution in the face of significant shocks and stressors. This allows even stressed households, like those in this group, to develop livelihoods strategies that are not completely defensive in the face of uncertainty.

The impact of state safety nets on household strategies is also suggested by the gendered patterns of vulnerability in this group. While the overall rate of concern for income and yields is higher among this group than those with ARL, the majority of the increase is from an increase in the number of women concerned with these issues. While men's concerns center on cultivating and keeping

enough food to meet their needs, given the insecurity of those in this group it is interesting that far fewer men than women report a concern for income and yields. This further suggests that the stressors they face are not yet enough to challenge men's ability see themselves as meeting a relatively constant set of expectations for their role and responsibilities in these households. Given the situation of these households, it appears these expectations are quite low and can generate material needs felt by women in their efforts to play their domestic role. Women are also more concerned about illness, water shortage, and the cost of inputs than are men. Men appear to be more concerned about crop theft than women (56% of men compared to 27% of women). The fact that men and women share similar levels of concern for access to firewood suggests that these households are somewhat more stressed than ARL households, where this stress could be confined to women.

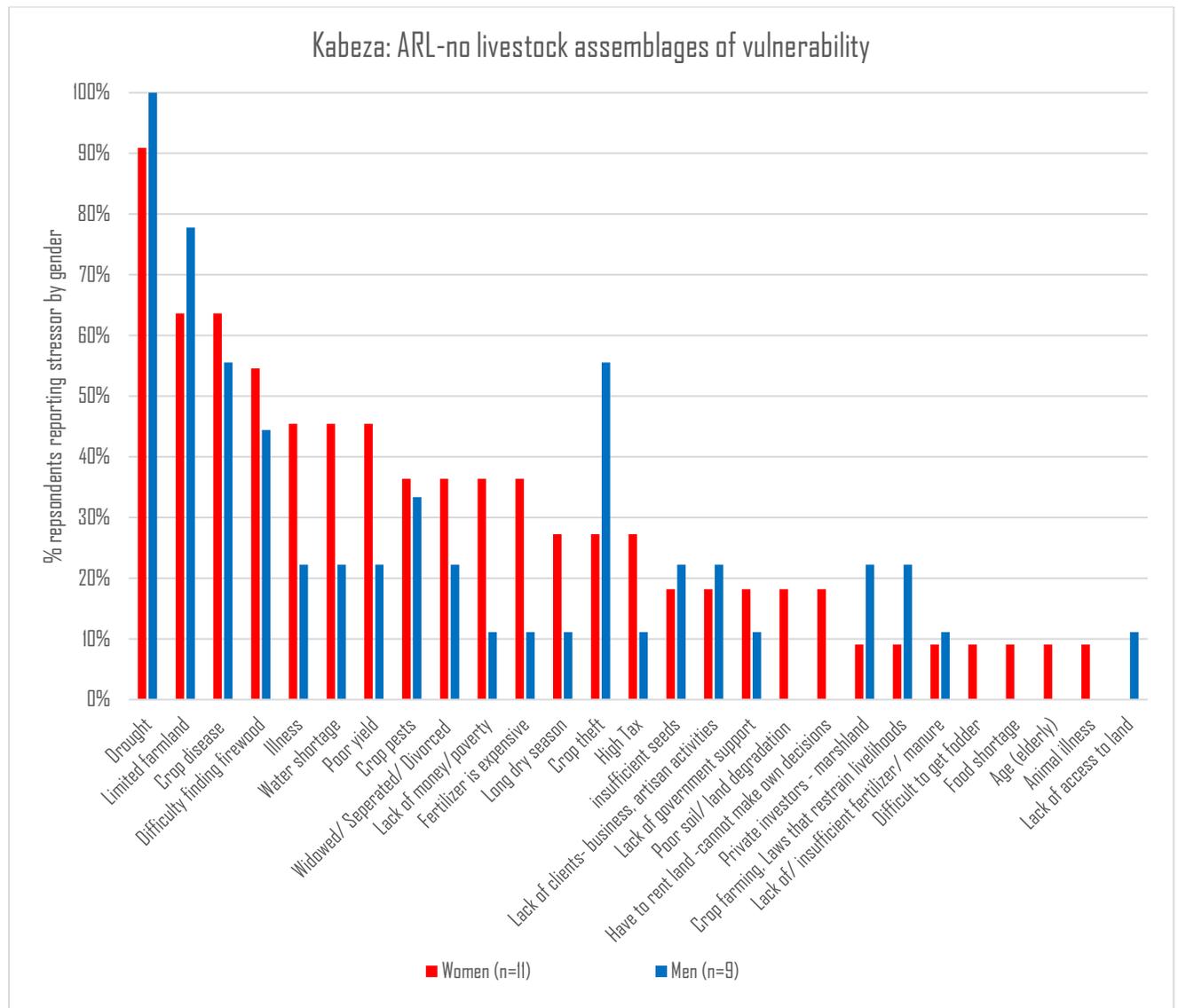


Figure 3.38: Livelihood concerns for ARL-no livestock respondents by gender

In summary, while there is little question that the absence of significant animal assets in ARL-no

livestock households presents material barriers to the achievement of security and well-being for those in this group, they do not appear to have perceived stresses significantly greater than those of their ARL counterparts. Instead, it appears that men in this group, while generating less food and income than those in ARL-no livestock households, are still able to meet the expectations of their role. While these expectations do not appear to meet all the needs of their households, as evidenced by women's increasing concerns for income and yield, there is no evidence that these men feel threatened in their roles. Indeed, the near-equal rates of participation of men and women in non-farm activities, a pattern closer to that of SIL than ARL, suggests that men in this group are relatively confident at meeting their responsibilities and achieving a very different set of goals than their ARL counterparts. The reasons for this are twofold. First, the households with ARL-no livestock can rely on state safety nets to avoid disaster in the context of shocks and stressors. Second, where those with ARL are seeking to achieve SIL, which puts pressure on men's production of food and income and threats to their status if such goals are not achieved, those with ARL-no livestock are still far from SIL, but can draw on state safety nets to avoid major challenges that might reduce them to LRL or worse. While this means those in this group are somewhat more materially stressed than those with SIL or ARL, the status of men in ARL-no livestock is somewhat more secure because of these lower expectations and their access to safety nets.

3.7.4 Limited Resource Livelihoods

The name of this group alone suggests stress, but this stress is perhaps not as much as what might be expected. Despite their challenges, those with LRL reported lower rates of concern for drought, crop disease, and pests than any other group (Figure 3.39). This is not to suggest that those in this group were without significant stresses, but that access to state safety nets meant that while their agricultural production was precarious, it did not pose an existential threat. They were very concerned with access to firewood, the limitations of their family situations (i.e. divorce or having been widowed), their access to seeds, their income situation, and their ability to determine their own agricultural decisions. This assemblage of vulnerability reflects an attention to what the members of this group can control (inputs, seeds, labor) and what they cannot (overall agricultural production, agricultural outcomes) because of the wide range of factors, from weather to the structure of land ownership, that inhibit them, and the presence of a safety net to protect them from the worst outcomes.

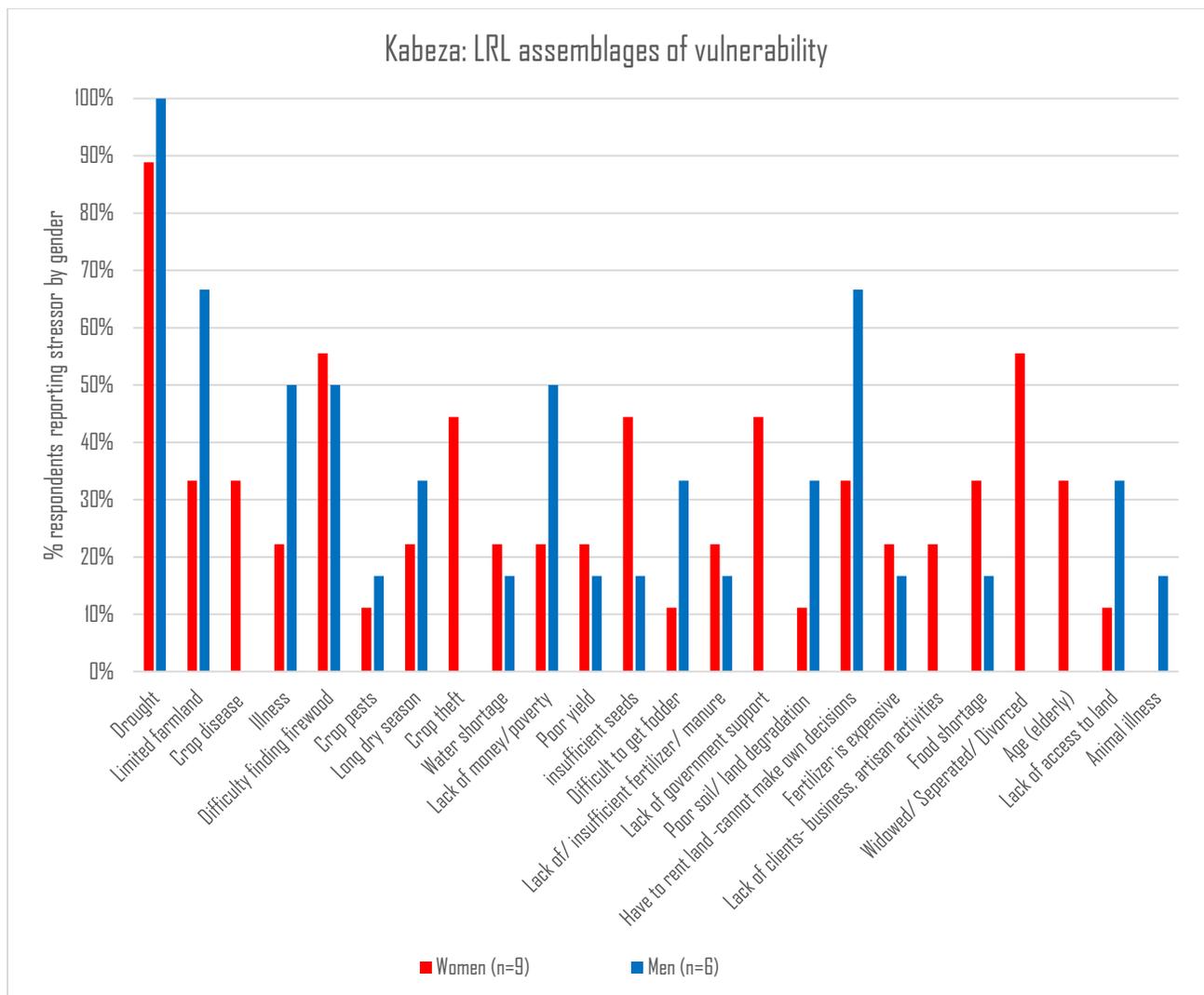


Figure 3.39: Livelihood concerns for LRL respondents by gender

While the sample size for this group, and therefore the number men and women in this group, is small, there are gendered patterns within the LRL assemblage of vulnerability. The linked challenges to well-being and status men face is reflected in their high rate of concern for the need to rent land, which is both a concern for access to needed assets and a concern over the limitations to their decision-making (and thus their role) posed by this mode of access to land. The need to rent land is closely linked to men’s much greater concern than women for access to farmland and their concerns for the quality of land they can access. In short, men’s assemblage of vulnerability in this group reflects a closely linked concern for material and social outcomes of agricultural efforts, where men’s roles and authority are very much in question. Men are also much more worried about illness than women, a reversal of the pattern seen in other groups. This reflects the reality that livelihoods outcomes in this group are much more precarious than in others, and illness to anyone in the household is likely to compromise agricultural outcomes in which men’s labor and decisions play a large part. Women are much more concerned with the implications of being widowed or divorced, which separates them from labor and resources needed to secure their well-being. They are also more worried about crop theft and food shortage, stressors that are having a direct impact on the availability of food within the home.

In summary, those with LRL are the most stressed in the community. These stresses are material, but the material aspect of those stresses are somewhat mitigated by the presence of safety nets. However, they also extend to the roles and responsibilities of men and women in a way that we do not see in other groups. Women's concerns for income and yield suggest that men in this group are not able to provide for their families in the same way as men in other groups, and therefore while they seem somewhat secure in their roles there is little question these are under pressure. At the same time, there is evidence that women in this group are concerned about meeting their own responsibilities to the household, especially with regard to food.

4 Findings: Gapfura Village, Livelihood Zone 04 (East Congo-Nile Highlands Subsistence Farming)

According to the FEWSNET livelihoods zone descriptions for Rwanda (Brown, Lecumberri and Mutunga 2012), Hindiro sector, where Gapfura is located, is within Rwanda Livelihood Zone 04-East Congo-Nile Highlands Subsistence Farming (RL04). RL04 averages 1,200-1,600 mm of rainfall annually and has acidic soils. As in RL12, agriculture is the main livelihood activity. However, the precipitation in this zone allows for two growing seasons and the cultivation of a wider range of crops including maize, beans, sweet potato, maize, cassava, Irish potatoes and banana. Most households practice animal husbandry with wealthier households likely to have the resources to invest and maintain larger livestock including cattle, while poorer households are likely to have smaller livestock including pigs, goats or rabbits. Access to markets is poor due to the hilly terrain of the zone. As a result, most household rely on local markets to sell crop surpluses. Wealthier households sell cash crops at the farm gate and may engage in trading activities. In addition to agriculture, residents from resource-poor households also farm for others or migrate for wage labor. Major livelihood stressors in the zone include excessive rain, landslides, soil erosion, long dry spells, and land fragmentation and landlessness.

4.1 Gapfura: Vulnerability Context

Figure 4.1 below represents the stressors and shocks reported by the 88 residents of Gapfura village interviewed in this study. As expected, stressors related to agriculture and animal husbandry dominated the general vulnerability context. Those impacting agriculture included the lack of inputs such as seed and fertilizer, crop disease and pests, limited farmland and soil degradation, and fluctuations in precipitation. Stressors related to animal husbandry included lack of fodder and animal illness. This vulnerability context aligns with the framing of the wider zone described above by Brown, Lecumberri and Mutunga (2012).

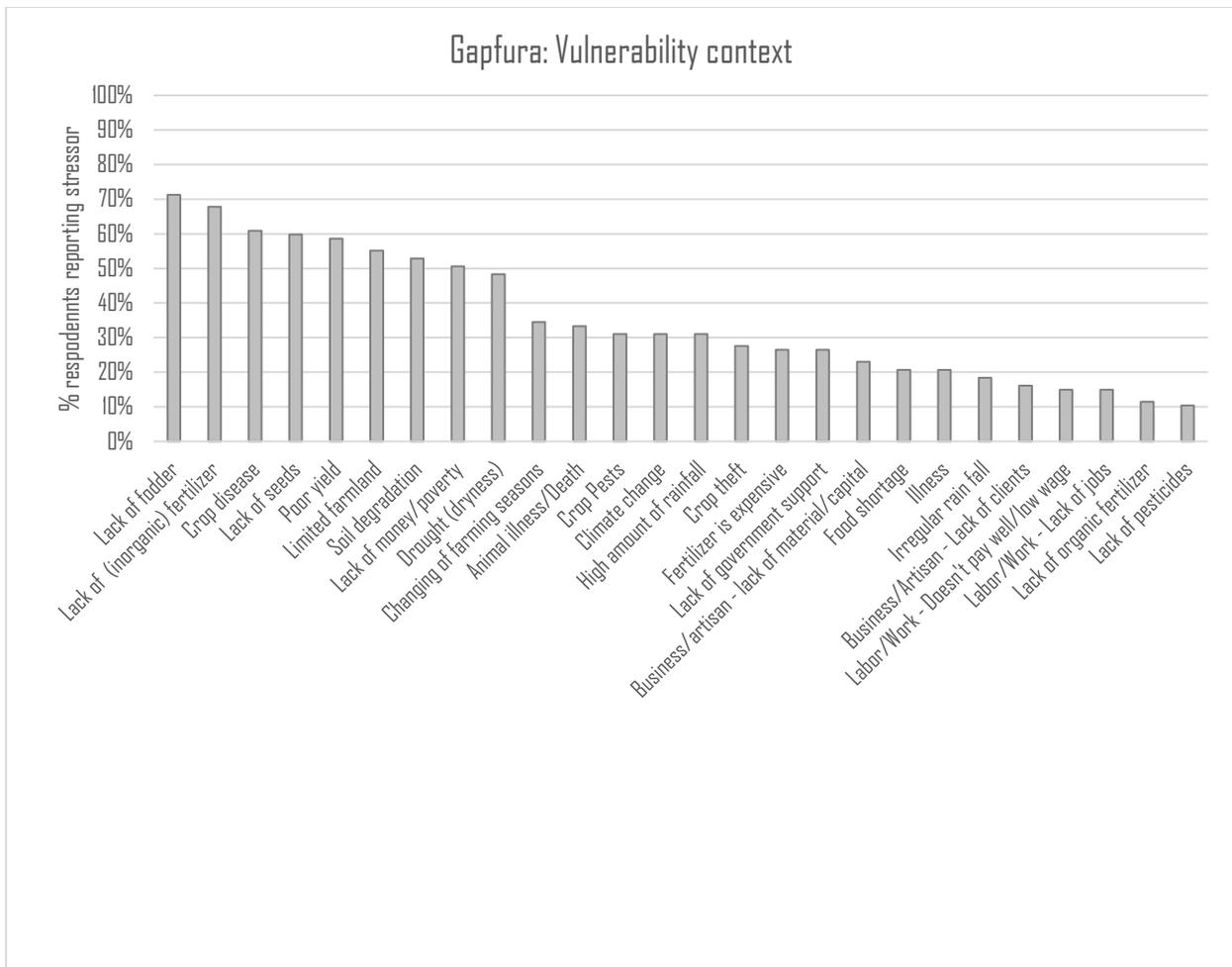


Figure 4.1: Livelihood concerns mentioned by ten percent or more of respondents in Gapfura (n=88)

An analysis of stressors and shocks at this broader community level obscures important differences in experiences of the vulnerability context. For example, while lack of fodder, the most commonly reported stressor, was reported by 70% of respondents, the rest of the respondents did not mention this stressor. This suggests there are variations in the experience, prioritization and perception of the vulnerability context within the community.

During data collection, the field team suggested that respondents be clustered into five groups based on shared assemblages of vulnerability. At the analysis phase, the team determined that five groups over-stratified the community, separating individuals with similar assemblages of vulnerability. Respondents were then consolidated into four groups. The rest of the analysis presented in this report stratifies Gapfura respondents into four groups (Table 4.1): Stable Income Livelihoods (SIL), Adequate Resource Livelihoods who were more dependent on agriculture (ARL-ag dependent), Adequate Resource Livelihoods who were more diversified in their livelihoods than those in ARL-ag dependent (ARL-diversified) and Limited Resource Livelihoods (LRL). These groups represent increasing vulnerability to livelihood stressors and shocks, and capture the situation of members of a household. Therefore, when someone is said to have SIL, they live in a household that owns large ruminants and land.

Group	Long Name	Animal Ownership	Agricultural Production	Nonfarm employment/ income
SIL	Stable Income Livelihoods	- Own large and small livestock but only if labor and time is available	- Likely to own adequate land - Agricultural production impacted by labor and time constraints	- Highest engagement in salaried employment and in business activities
ARL-agriculture dependent	Adequate Resource Livelihoods – agriculture dependent	- Likely to own large and small livestock - Significant number of respondents' livestock provided by Govt/NGOs	- Likely to own land but also likely to rent additional land - More reliant on agricultural production for income	- Some engagement in business activities, artisan activities and informal wage labor but at lower rates than ARL-diversified
ARL-diversified	Adequate Resource Livelihoods-diversified	- Likely to own livestock - Significant number of respondents' livestock provided by Govt/NGOs	- Likely to own land but also likely to rent additional land - Agricultural production more constrained than those in ARL – Ag dependent	- Engagement business but have capital constraints, - Highest engagement in artisan activities - Relatively high engagement in wage labor.
LRL	Low Resource Livelihoods	- Likely to own livestock - Significant number of respondents' livestock provided by Govt/NGOs	- Ownership of land is limited among these respondents - Agricultural production severely limited by the lack of resources	- Primarily dependent on informal labor for income - Lowest engagement in business and artisan activities

Table 4.1: Vulnerability Groups in Gapfura

Figure 4.2 below shows the stressors and shocks reported by the four groups. Respondents with SIL had the highest rates of concern for a changing climate, animal illness, and lack of organic fertilizer (but the lowest rates of concern over the lack of inorganic fertilizer). Their concern with lack of organic fertilizer, taken together with their relative low rates of concern over the impact of soil degradation, poor yield, lack of money, and limited farmland suggests that they are focused on barriers to securing production from a relatively secure resource base, rather than concerns about fundamental challenges to their material well-being. The concern of SIL respondents over animal illness is related to constraints faced by this group with regard to the time and labor required to engage in animal husbandry, therefore limiting their animal holdings. Nonetheless, within RL04 animal assets remain an important source of funding other livelihood activities and feeding the household. As such, the concern over animal illness is related to worries among those with SIL to keep their animal assets intact.

ARL-ag dependent respondents had the highest rates of concern over lack of fodder. This is an important difference between this vulnerability group and those in SIL, as those with ARL-ag dependent may own animals, but have some difficulty feeding them. These concerns indicate respondents who desire to secure rather than those with already secure livestock assets. ARL-ag dependent respondents also had the highest rates of concern over factors influencing crop production (crop disease, drought and food shortage), which suggests that these respondents were not as secure in their crop production as those with SIL. This insecure production is compounded in this group as they are more dependent on agriculture than those with SIL lacking the relative stable

non-farm income of the latter group. These respondents also reported the highest rate of concern over lack of money and a lack of government support. The high rate of concern for such stressors is not simply a reflection of their material situation. At the time of the study, many ARL-ag dependent respondents were categorized as well off enough not to receive additional government support. However, these respondents still struggled to pay for health insurance and taxes, which strained their cash reserves. Further, ARL-ag dependent respondents also reported the highest rates of lack of clients for business and artisan activities and illness, stressors that have an impact on their ability to sustain their non-farm activities. Thus, their challenges are related to being between a highly secure income/material situation, and being insecure enough to gain government assistance.

ARL-diversified respondents reported the highest rates of concern for soil degradation, changing of farming seasons (changes in the onset and length of growing season), crop theft, and crop pests. They also had relatively high rates of concern for limited farmland. Like those with ARL, these concerns center on factors that have an impact on securing agricultural production. However, the emphasis on a different range of stressors within the vulnerability context is likely related to the different resources and livelihood portfolios of respondents with ARL-diversified relative to ARL-ag dependent respondents. Those with ARL-diversified are less reliant on livestock than those with ARL but are more reliant on business, informal work and artisan activities. These differences are discussed in further detail under section 2.4: 2.4- Subgroup Activities and Decisions- ARL-diversified respondents, along with those in LRL, reported the lowest rates of concern over animal illness. Those in ARL-ag dependent and ARL-diversified vulnerability groups the most engaged in the caretaking of livestock for others. While they were responsible for the day to day provision of fodder and care, the responsibility for veterinary bills was not necessarily borne by these respondents. Thus, animal illness was not a direct threat to the livelihoods or well-being of many ARL-ag dependent and ARL-diversified respondents.

Those with LRL were most concerned about lack of inorganic fertilizer, lack of seeds, limited farmland, and high amount of rainfall, which damages crops. These respondents also reported relatively high rates of concern over poor yield. These concerns reflect respondents' lack of access to fundamental inputs that support basic agricultural production. LRL respondents also had the highest rates of concern over the lack of wage work, reflecting a lack of opportunities to earn needed cash. In short, those with LRL are extremely precarious.

However, even in this group only a little more than half of respondents mentioned concerns for income. At the same time, they also report relatively high rates of concern for lack of fodder, and rates of concern for animal illness similar to those seen in other groups, which is surprising for a group that is materially challenged. This particular assemblage of vulnerability reflects the intervention of the Rwandan government in rural livelihoods. The government provides animals to the most impoverished, thus creating an important asset base for these residents from which they might build up their livelihoods. As a result, they have means of earning income and feeding their households that they would otherwise not have access to. However, these residents remain land and labor constrained, and therefore have difficulty feeding the animals they are given.

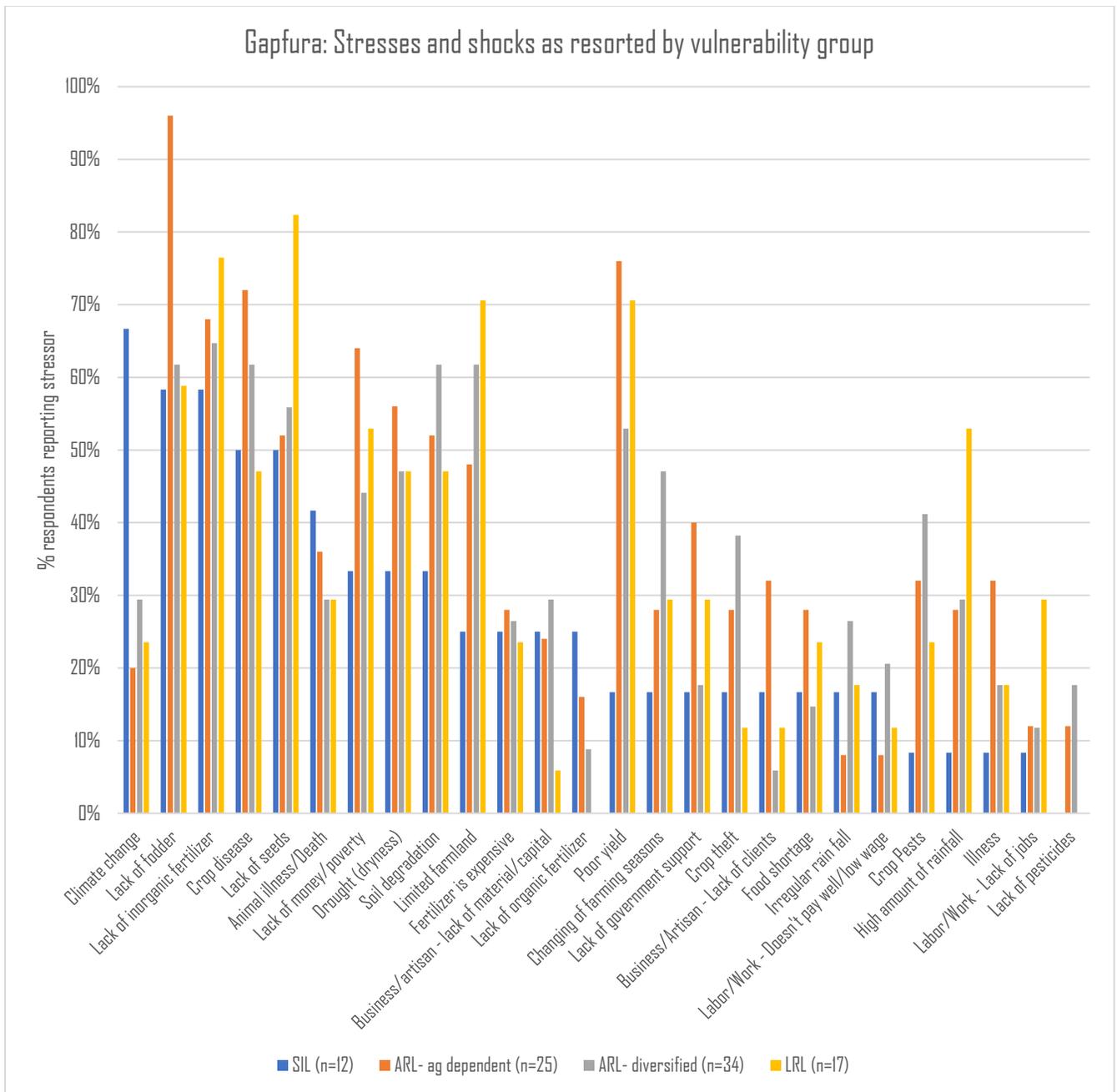


Figure 4.2: Assemblages of vulnerability associated with members of four vulnerability groups in Gapfura

The residents of Gapfura, while living in the same place, had different experiences of the vulnerability context they were embedded in. Grouping the residents by these vulnerabilities helps us to better understand their livelihoods decisions. As in Kabeza, some of the variations in the experiences of the vulnerability context can be attributed to the assets that different community members have access to. However, the ways in which different roles and responsibilities play out in the context of this varied access is a critical aspect of the different livelihood strategies (including the use of CIS) community members choose to embark on.

4.2 Identity, roles and responsibilities in Gapfura

In Gapfura the household is the principle organizing unit for livelihoods, and important social cleavages played out at this level. Within each of the groups described above, different individuals were associated with different social roles, and therefore had different responsibilities that shaped their ability to make livelihoods decisions. Gender was the principal social cleavage shaping roles and responsibilities, but seniority also played a role. Understanding these roles and responsibilities as they emerged at the intersection of gender and seniority allows us to better understand the patterns of engagement with particular activities, moving beyond a description of who was undertaking a given activity to *why* that this person was undertaking the activity.

The residents of Gapfura identified several roles associated with “good” men. Broadly, men are expected to be hard workers for their households (reported by 34% of the sample). Residents also expected men to be wise (29.5% of the sample), as well as, faithful to their wives, whether by avoiding adultery (25% of the sample) or prostitutes (17% of the sample). It is interesting that while concerns for adultery are well-distributed across the sample, two thirds of those who mentioned prostitution were senior men. While men were expected to play the role of hard workers for their households, interviewees did not directly assign senior men the responsibility of providing food or income. This is not surprising, given the broad expectations of men described above and that households are likely to be monogamous. Instead, the clearest senior men’s responsibility voiced by the residents of Gapfura was a responsibility to advise others (16% of the sample). While most interviewees did not specify who senior men should advise, one senior man noted that men should “give advice to neighbors” (GA78).

The specific roles associated with senior men highlight their greater status and responsibility in the community relative to junior men and women. More than anything, residents noted that they are expected to be wise (61% of all interviewees mentioned this characteristic), and were responsible for using their wisdom as to advise others (67% of all interviewees). For example, a senior woman (GA8) noted that a senior man should be a “wise man, have good ideas...and give advice to others,” while a more junior woman (GA40) said “a good old man is someone who has good ideas, gives advice to others, and he is a wise man.” Junior men (or youth) were expected to be hard working (mentioned in 67% of interviews) and disciplined and obedient (referenced in nearly 57% of interviews). This aligns closely with the representation of junior men’s pathways to social advancement, both in terms of status and being able to marry, via hard work in farming, animal husbandry, and off-farm employment (Jones 2008).

There was surprisingly low agreement across the sample on the roles associated with a good woman. 51.1% of those interviewed said a good woman’s role included keeping her family’s secrets – a view shared nearly equally among women and men, and across the range of ages and vulnerability groups in the community. This was never mentioned in discussions of men’s roles. Women are responsible for educating their children and managing the domestic space of the family. Even the expectation of obedience was only noted by 22.7% of those interviewed, and evenly distributed across genders and ages. Like senior men, senior women were expected to be role models and advisors to others. While both senior men and senior women held roles as advisors, it appears that they were responsible for advising different people. While most respondents were not clear who women were expected to advise, one senior man (GA 64) said that senior women were to “give advice to other women,”

suggesting that, as seen in the literature, even senior women did not have a voice in the disposition of household property or livelihoods decisions.

The roles which emerge at the intersection of gender and seniority in Gapfura produce associated responsibilities. Decisions about land use and the utilization of income and other resources were made at the household level. Both men and women in the study reported that, ideally, both spouses made decisions jointly. A 67-year-old woman explained how decisions in her household were made in this way, “All decisions about farming, about animals and about money in our household are taken by me together with my husband in order to avoid conflicts, to make best decision and to be developed in our house (GA04; see also GA02; GA03; GA12; GA15; GA16; GA18GA25; GA29; GA30; GA34; GA36). The move towards equal decision making has been aided by the Rwandan constitution, which allows women significant rights and protection within marriage. However, we found that in many households men retained decision making power over the household’s livelihood activities, income and other resources with women playing a supplemental role. In these instances, women deferred to their husbands on agricultural, livestock, and financial decisions. For example, a 38-year-old woman explained how decisions were made in her household in this way, “My husband, he’s the one who makes the decisions about farming, animal raising and the use of money because he’s the chief of the house and I have to be under him. But I help him [with] ideas (GA11; see also interviews GA08; GA22; GA33). Traditionally, men’s power to make household decisions rested on their ability to more easily access critical livelihood assets such as land or income opportunities. This privileged access to resources derived from a social understanding that men bore the primary responsibility for supporting a wife and family. There is evidence that within Gapfura, men’s power to make decisions was predicated on significant inequalities in the contributions to the household’s material wellbeing. Among our respondent sample, we found that women’s decision making was particularly curtailed if they did not have an independent source of income. For instance, A 33-year man explained why he alone made decisions in the household, “I am the only one who makes decisions in my household of farming, raising animals and the use of money because I am a chief of the house and I am the one who invest the money in those activities. My wife doesn’t have a job. She only makes, in practice, my decisions (GA41). As such, in Gapfura, as in the wider rural Rwandan context, household decision making, in many ways remains patriarchal.

Other models of decision making did exist within the community. In some households, the spouse who was involved in the day to day management of farming and animal care made the relevant decisions. For example, a 39-year-old man said “My wife makes decision about farming because she is the one who is supposed to follow agricultural activities in time, I have to go to search for work. I don’t take th[ose] decisions because I am sometimes not at home (GA39; see also interview GA09; GA10; GA23; GA37; GA48). This was also the case in households where the male spouse was present but was, for some reason, incapable of making sound decisions, such as in the case of the 32-year-old woman who said “It is me who makes all decisions about farming and money because it is me who does all the activities without the help of other person and I do all in the household alone” (GA40). If the woman was widowed or if her husband was away, she became responsible for these decisions. One young woman (GA02) noted “The decisions about farming in our household are taken by me because I am the one who participates in agricultural activities alone, where my husband [is] a driver.” A senior woman (GA28) was in charge for a different reason: “All decisions about farming, about animals and about money are taken by me because I am a widow no one can help me to make decisions in my house and I am a chief of the house now.” Within a few households some decisions were made jointly and others were undertaken independently by household members. For example, a 73-year-old respondent lived and farmed with her widowed

daughter and her son who was not yet married. While decisions about farming were made together, decisions about the use of cash income were made independently by each member of the household (GA62).

Both men and women in the study indicated that even though they were not obligated to share their income with their spouses, the majority of what they earned was used to contribute to the subsistence of the household. Ostensibly, women were not obligated to spend their money on household needs. However, most did so out of an implicit responsibility for the upkeep and reproduction of the household (Interviews GA02; GA06; GA11; GA21; GA26; GA24; GA35; GA43; GA65; GA67; GA79). For example, one junior woman (GA23) noted “I am not obliged to share the money from selling agricultural activity or cultivating for others. I only use it for the needs of the household.” However, there is more than an implicit responsibility on the part of women here, for as another junior women (GA27) said “The money that I get from selling my agricultural produce or in my activities of cultivating for others I am not obliged to share with [my husband]. I only use it to buy food and solve other problem at home, but before selling agricultural produce I have to tell [my husband] what I am going to use that money for.” Another junior women (GA52) made the implications of these expectations clearer, saying “I am not obliged to share with my husband the money that I make from my agricultural produce or from my business but I use it at home, so when I don’t use it at home it can create conflicts.” Women are expected to educate children in proper behavior and social roles. As noted above, senior women are responsible for advising younger women

Overall, gendered decision-making structures over land persist even though the Rwandan government has undertaken legal reforms to improve the position of women with regard to resource ownership, economic opportunities and related to gender-based violence.²¹ Urban and wealthy women are better positioned within the opportunity structures created by progressive laws to claim and exercise their rights. As an example, Rwandan laws provide equal rights to women for ownership and inheritance of property as well as joint ownership of this property in legal marriage. However, (Abbot 2015) found that although land was often registered under the names of both spouses, and that rural women were aware of this, underlying patriarchal rationales which legitimate men to make decisions about land and manage household finances, as the head of household, still persist. Consequently, land, even when co-owned with the female spouse was often conceptualized as belonging to the male spouse. In addition, Abott found that women who try to change norms and values related to the control of land face resistance. Therefore, for women living in rural areas, such as Gapfura, the transformation of patriarchal ideologies and the associated subordination of women’s decision making has occurred at a slower pace. As can be seen from the interviews, the change has also been uneven being dependent on a wide range of factors such as women’s access to independent income.

²¹ These laws include: the Law Governing Persons and Family (amended in 2015) Land Law of 2013 (Law No 43/2013 of 16/06/2013); Law on Gender Based Violence (Law No59/2008); Matrimonial Regimes, Liberties and Successions Law (Law No 22/99 of 1999); 2008; the 2009 Labor Law (Law No 10/2009); and the Labor Law

4.3 Discourses of Livelihoods in Gapfura

In this section, we explore the activities various community members pursue and why. To understand how respondents identified and understood the appropriate conduct of livelihoods activities, we triangulated information on observed patterns of behavior with explanations residents provided for the choices they make. As can be seen below, agriculture and livestock husbandry are the dominant livelihoods activities in Gapfura, though there is significant participation in informal wage labor and in business pursuits (Figure 4.3).

4.3.1 Patterns of Activity

Agriculture was conceptualized as a subsistence activity. Across the four vulnerability groups, agricultural production was mainly for household consumption with the sale of surpluses. All respondents participated in farming (Figure 4.3). The activity fed the household directly while alleviating the cost of buying food on the market. For example, a 39-year-old woman said “I often farm those crops... because it’s expensive to buy [food on] the market, better I farm them” (GA21, see also GA07; GA35; GA73; GA75; GA80; GA83; GA85; GA87). Respondents talked about farming as a cultural heritage passed on from older generations. A 34-year-old woman explained why she farmed in this way, “when I married I found my in laws farming those crops even [our] farmlands they gave us... so I also keep farming those crops [because] I thought that it was... culture” (GA55, also GA06; GA87). The activity was also an important source of income from the sale of surpluses (GA06; GA07; GA81). As in Kabeza, farming in Gapfura was also an activity in which some respondents engaged because they did not have the capital to initiate other activities (GA52; GA80), nor the skills to embark on other activities (GA02; GA08; GA10; GA16; GA28; GA83). Finally, farming was also seen as an important sources of nutritious and medicinal foods (GA67). However, the continued engagement of SIL respondents with formal employment in the activity underlies the centrality of farming to the livelihoods of those in Kabeza.

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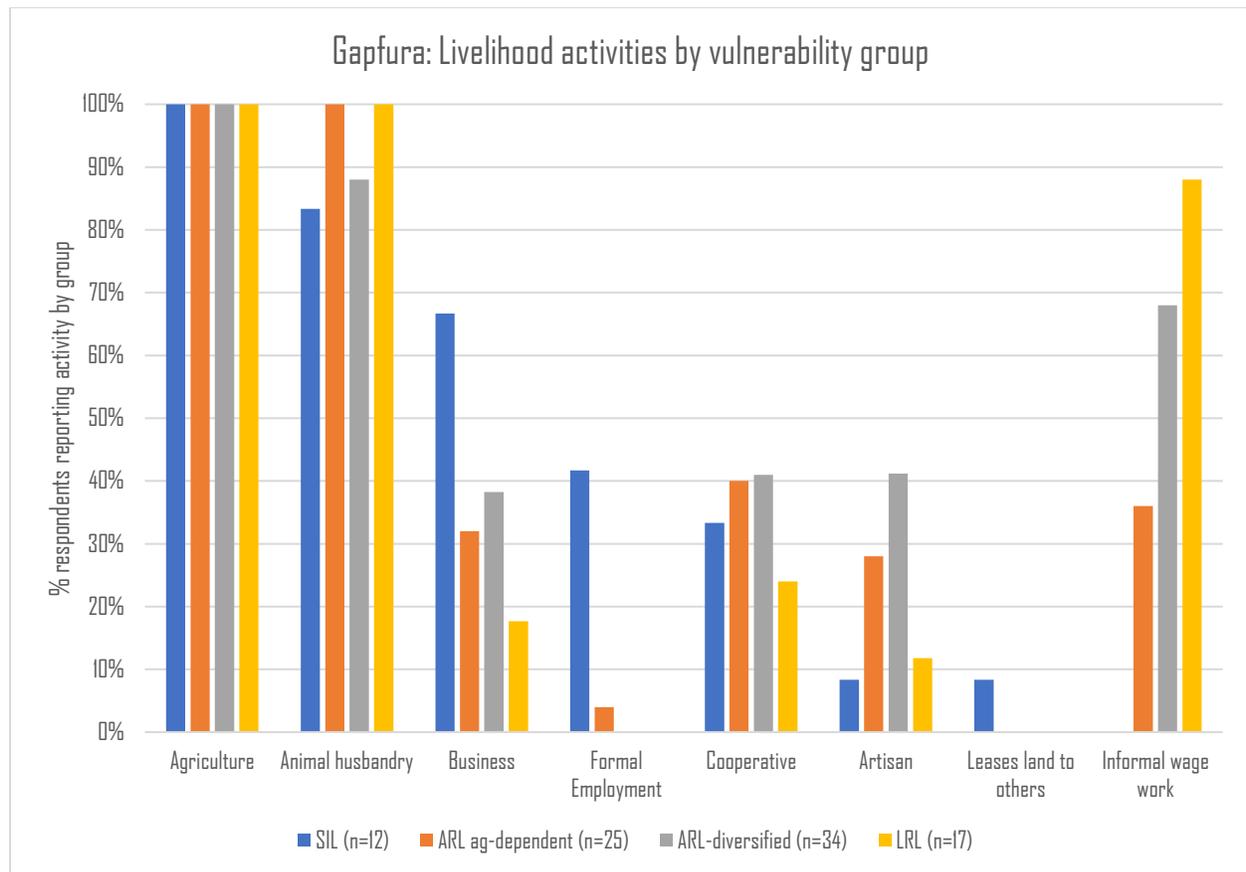


Figure 4.3: Livelihood activities in Gapfura by vulnerability group

Eighty three percent of those in SIL participated in animal husbandry. All ARL-ag dependent respondents, 88% of those with ARL-diversified, and all LRL respondents engaged in animal husbandry. The lower rates of engagement in animal husbandry by those in SIL can be partially attributed to strategic decisions by respondents in this vulnerability group not to rear animals. A 27-year-old female teacher whose husband was working outside of the village explained her decision not to engage in animal husbandry in this way, “There is no animal that I raise because to manage them is difficult for me to do my job and the job of [my]husband which is far from our home. So to take care of them - it cannot be easy for us” (GA06). On the other hand, the high rates of engagement in animal husbandry among respondents with ARL-diversified and LRL, groups that might be expected to be asset-challenged, was as a result of government and NGO support programs that provide resource poor households with livestock as a means to boost their asset base. Animal husbandry was a source of organic manure (55% of respondents mentioned this as a primary reason for owning animals). Livestock was also important as an investment. Animals were sold in case of unanticipated family emergencies as well as for meeting recurring household needs. Finally, animals were valued as a source of protein (See interviews GA03; GA05, GA07, GA08; GA13; GA 22; GA24; GA28; GA37; GA41; GA43; GA50; GA68; GA74; GA79; GA83; GA84; GA86).

Those with SIL had the highest rates of participation in business (67%). Thirty-two percent of those with ARL-ag dependent, 38% of those with ARL-diversified and 18% of LRL respondents also engaged in business activities. This included activities such as selling household goods, for example as sugar and soap, or trading of crops at local agricultural markets. The declining patterns of engagement across vulnerability groups are to be expected, as business activities require an initial cash investment as well as reserves to pay taxes and other maintenance costs. Formal employment was dominated by those with SIL. Forty-two percent of respondents in this group reported having salaried employment. Of respondents from the other three vulnerability groups, only a few respondents with ARL-ag dependent (4%) reported some form of formal employment. Business activities were an important source of cash to meet daily household needs (GA24; GA45; GA72; GA84). These activities could also be lucrative enough to finance substantial household projects such as building a house (GA73). A critical aspect of business activities was that they could be combined with other livelihood activities (GA55).

Respondents from all four vulnerability groups participated in cooperatives. Participation in cooperatives was desirable as a source of loans for funding livelihood activities and to cover large emergency needs, and as a way to save money (GA13; GA44; GA88). The value of these loans was explained by a 51-year-old man in this way, “participating in cooperatives help[s] me to get a loan to use [to] add to my [business] capital, and have access to the inputs like buying seeds, and inorganic fertilizer, and feed my household, and [other] needs (GA17). Thirty-three percent of those with SIL, 40% of those with ARL-ag dependent, 41% of those with ARL-diversified and 24% of those with LRL were members of a cooperative. SIL respondents likely reported lower rates of participation in cooperatives than those with ARL and ARL-diversified because they had more stable and regular incomes, which can reduce the need for credit. Those with LRL had the lowest rates of participation as regular weekly or monthly payments were required in order to maintain membership in a cooperative. As LRL households were resource poor, many respondents from this vulnerability group would have difficulty making the payments needed to maintain membership. A small number of those with SIL reported participating in artisan activities. These are a range of activities which required special skills, such as brick making, skilled construction labor or making various types of crafts. Those with ARL-ag dependent (28%) and ARL-diversified (41%) relied the most on artisan activities. Twelve percent of LRL respondents also participated in artisan activities. Like business activities, artisan activities were an important source of income to cover household needs and were valued as they could be combined with other livelihood activities (GA39). Artisan activities however, required less capital than business activities. Only SIL respondents reported that they rent out land to others within the community as a livelihood strategy.

No SIL respondents participated in informal wage work. Thirty six percent of those with ARL-ag dependent, 68% of those with ARL-diversified and 88% of those with LRL participated in informal wage labor. Informal wage labor included cultivating for others as well as other forms of unskilled labor, such as construction labor or goods portage, that were paid on a daily basis. This was often physically taxing work and those who engaged in these forms of labor did it because they did not have enough land to produce an adequate amount of food for their families, they lacked other work opportunities, or because they needed emergency cash at certain times of the year. As a 19-year-old woman respondent explained, “many people in this village cultivate for others because of [a] lack of means. That’s the way they get the small money to eat or to use for different problem that she/he is facing at home. Many of them didn’t study to get a good job. They don’t even have skills [for] handicraft work. Also, they don’t even have capital to do business. They only make living by farming... and cultivating for others because that’s what they can do to make a living (GA79, see

also interviews GA06; GA11; GA13; GA16; GA17; GA18; GA29). Informal wage work was a critical livelihood activity particularly for those within ARL-diversified and LRL respondents as it was, for many of them, the only way to earn much needed cash to meet household needs (GA71).

Most residents engaged in at least one form of non-farm income in Gapfura. These non-farm activities, excepting for those engaged in salaried employment, were supplemental to agriculture. Among those with formal employment, agriculture was *supplemental* to salaried employment but nonetheless remained a critical livelihood activity. A 39-year-old female farmer explained this when talking about the livelihood activities of her household, “I make life with farming and raising livestock. I farm: beans, maize in both season A and B; bananas and cassava in both seasons A and B even in dry spell season. But farming and raising are not the main major work to survive, this is to support my husband’s salary. He is a soldier in Rwanda army” (GA21). For respondents without salaried work, farming was the main source of food and income with off farm activities providing extra income to cover household expenses and farming expenses. There were clear differences in engagement in non-farm activities among respondents across the four vulnerability groups (Figure 4.4). Those with SIL are primarily engaged in salaried employment and business activities. ARL-diversified and ARL-ag dependent respondents participated in business activities at lower rates but had the highest rates of engagement in artisan activities and substantive engagement in informal wage work. LRL respondents on the other hand were more likely to participate in informal wage work.

A wide variety of staple crops were grown in Gapfura, including maize, beans, sweet potato, cassava, East African highland banana and yam (Figure) All respondents in this village farmed maize and beans, and nearly all farmed sweet potato and cassava. All respondents with ARL and ARL-diversified reported having banana plants. Interestingly, those with SIL and LRL reported much lower rates of banana cultivation than those with ARL-ag dependent and ARL-diversified. Overall rates of yam cultivation were much lower than the other five crops. Only 67% of those with SIL, 80% of those with ARL-ag dependent, 91% of those with ARL-diversified and 59% of those with LRL cultivated the crop. Two minor staple crops, Irish potatoes and soybeans were also grown by respondents.

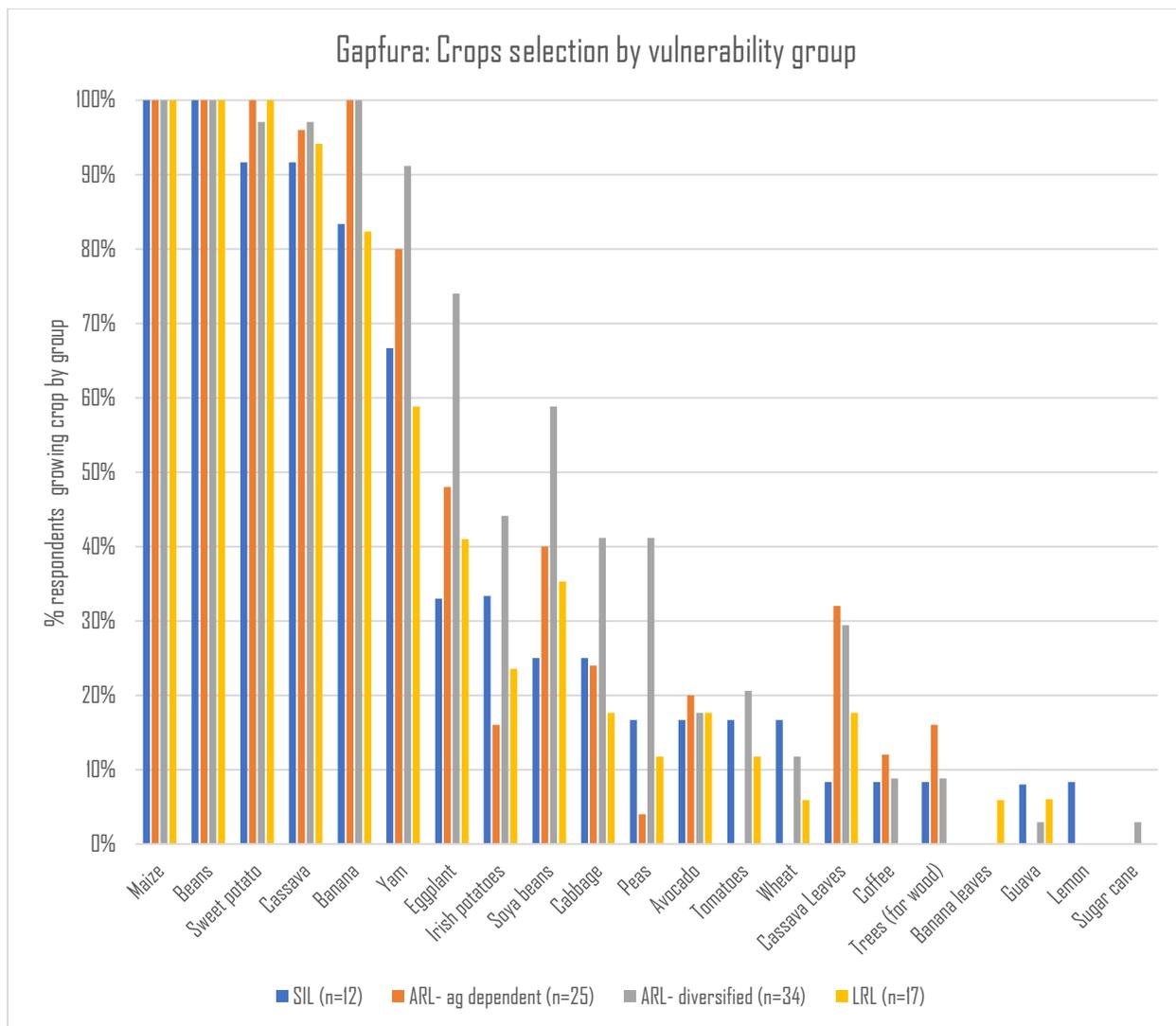


Figure 4.4: Crop selection in Gapfura, by vulnerability group

Overall, the selection of staple crops was based on the suitability of the crops to local agroecological conditions. As such, the crops produced a relatively good yield regardless of variations in precipitation and soil conditions, making them important for food security (See interviews GA02; GA03; GA05; GA10; GA11; GA12; GA16; GA19; GA25; GA27; GA36; GA39; GA49; GA54; GA60; GA63; GA64; GA70; GA73; GA77; GA78; GA79; GA81; GA88). In addition, these crops could be intercropped, an important consideration given the limited land available for cultivation in this community even among those with relatively good access to land. Additionally, taste was an important consideration for respondents (See interviews GA02; GA09; GA14; GA18; GA21; GA24; GA26; GA28; GA32; GA36; GA40; GA58; GA59; GA60; GA66; GA68; GA70; GA72; GA74; GA76; GA80). Staple crops were easily marketed, and the sale of surpluses was an important source of cash for households. As a 30-year-old woman explained, “when I am in the time of crisis, I can take either bananas and cassava and sell to the market” (GA51 see also GA53; GA59; GA65; GA79). Sales of produce from staple crops were also used to cover large expenses including construction costs, seed and fertilizers (GA53; GA73). Farmers also indicated that they grew staple crops in order to reduce the costs of buying food. Finally, government crop regionalization influenced and incentivized farmers to grow specific crops, particularly maize and beans (Interviews

GA09; GA11; GA13; GA15; GA21; GA25; GA29). According to respondents, the government provided bean and maize seeds to households identified as resource-poor (GA21) and residents who bought maize seed received inorganic fertilizer as well (GA61). Unlike in Kabeza, respondents in Gapfura did not identify crop regionalization as an impediment to their livelihoods.

Figure 4.5 represents the overall reported uses for crops for each of the vulnerability groups in Gapfura. Across the village, it is clear that beans and maize were principally cultivated for subsistence. Particular interesting patterns emerged in the cultivation of sweet potato, banana, yam and soybeans. Bananas were particularly desirable as they could be used to make beer, a lucrative venture, could be sold on the market, and could be consumed in the household. Sweet potato and cassava were also important crops that could both be sold and consumed within the household. Therefore, sweet potato, cassava, and bananas were key staples that most residents produced in surplus, and which had value when marketed. While yams were mostly consumed within the household, they could also be sold on an ad hoc basis. The lower rates of cultivation of banana and yam among those with SIL suggests that these crops were a lower priority as food security or income earning crops for these respondents. As avoiding the costs of buying food was a primary motivator for growing staple crops, it was likely that some SIL respondents, given time and labor constraints, were not inclined to grow these crops choosing instead to purchase these foods from the market. On the other hand, LRL respondents, with significant land and labor challenges chose not to cultivate these crops (GA02; GA03; GA08; GA12; GA22; GA64; GA78; GA79). Most other crops, including vegetables, are principally cultivated for household consumption, with the exception of avocado, coffee, and guava. Soybeans were particularly desirable for households with young children as the crop was considered nutritious and, therefore, consumption was perceived to prevent malnutrition and Kwashiorkor (GA03; GA49; GA71; GA84).

Reported crop uses, by vulnerability group

	Beans	Maize	Sweet Potato	Cassava	Banana	Amaranthus	Yam	Leeks	Eggplant	Soy	Irish Potatoes	Cabbage
SIL	Eat more than sell	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat and sell equally
ARL-ag dependent	Eat all	Eat all	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat all	Eat all	Eat all	Eat all
ARL-diversified	Eat all	Eat all	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat more than sell	Eat all	Eat more than sell
LRL	Eat all	Eat all	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat all	Eat more than sell	Eat all	Eat all

	Peas	Carrots	Avocado	Onion	Tomatoes	Chili	Coffee	Wheat	Beetroot	Goyava	Lemon	Spinach
SIL	Eat more than sell	Eat all	Sell more than eat	Eat all	Eat more than sell		Sell all	Eat more than sell	Eat all	Sell more than eat	Sell more than eat	
ARL-ag dependent	Eat all	Eat all	Sell more than eat	Eat all		Eat all	Sell all					Eat all
ARL-diversified	Eat more than sell	Eat all	Sell more than eat		Eat more than sell	Sell more than eat	Sell all	Eat more than sell	Eat all	Eat and sell equally		
LRL	Eat all	Eat all	Sell more than eat	Eat more than sell	Eat all	Eat all		Eat all		Eat and sell equally		

Figure 4.5: Reported crop uses, by vulnerability group, in Gapfura. Crops are represented right to left, and top to bottom, from most- to least-commonly cultivated

Although cultivated at much lower rates than starches, respondents across all groups also grew a variety of vegetables including eggplant, cabbage, and tomatoes. In addition, those growing cassava and banana often utilized the leaves of these crops as a source of nutrients. In Gapfura, the most commonly-provided reason for growing vegetables was to increase the variety of nutritious foods available within the household. Some residents cultivated kitchen gardens. However, because of the

higher precipitation range within RL04, most respondents in Gapfura grew their “garden” vegetables in the same manner as field crops, relying on rainfall instead of hand irrigation to water these crops (an exception was tomato). Vegetable crops in Gapfura therefore are included in the general crop disaggregation for Gapfura.

Eggplant was the most commonly grown vegetable, with 33% of SIL, 48% of ARL-ag dependent, 74% of ARL-diversified and 41% of LRL respondents reporting the cultivation of this vegetable. The popularity of eggplant among vegetable crops was a product of the relative ease of acquiring seed, its taste, and the fact it could be intermixed with other crops (See interviews GA03; GA11; GA14; GA16; GA22; GA22; GA24; GA28; GA32; GA42; GA44; GA47; GA48; GA53; GA56; GA61; GA65; GA66; GA72; GA74; GA75; GA83; GA86; GA88). Among those who did not cultivate eggplant, the majority indicated that the shortage of land was the major reason (See interviews GA02; GA03; GA08; GA11; GA12; GA22). This explains the lower rates of cultivation among those with LRL. For others, the decision not to grow eggplant was based on the consideration that the crop gave a mediocre yield and was not costly to buy at the market (GA46). Twenty five percent of those with SIL, 24% of ARL-ag dependent respondents, 41% of ARL-diversified respondents and 18% of LRL respondents cultivated cabbage. The lower rates of cabbage cultivation were partly attributed to the desirability of the crop for thieves. A 47-year-old woman demonstrated the lengths respondents needed to go to in order to prevent such theft, “others don’t grow the cabbages because the thieves like to steal them but me, I grow [mine] in front of the house so that the thieves cannot steal them” (GA14). Moreover, according to other residents, cabbage did not provide a high yield per area of cultivated land. Given the limited land available for farming in this community, priority was often given to other high yielding crops (See interviews GA08; GA16; GA26; G29; GA30; G32; GA44; GA46; GA50; GA70; GA80; GA86). Few respondents grew tomatoes. The low rates of cultivation of the crop were attributed to poor yield (See interviews GA06; GA08; GA16; GA18; GA20; GA24; GA26; GA30; GA32; GA40; GA53; GA68; GA70; GA72; GA74; GA76; GA78; GA80; GA84; GA86), the fact that the crop could not be intercropped, a critical consideration considering most households in the area had a shortage of land (GA17; GA71; GA73), and also that the crop required additional activities such as mulching and irrigation (GA52; GA60) and therefore could not be grow by households with labor shortages.

Wheat and coffee constituted the main cash crops in this community. These crops were cultivated by a minority of farmers in Gapfura, as they required a dedicated field and could not be intercropped. Given this critical constraint, it is not surprising that relatively few farmers reported cultivating these crops, or that those with SIL were the most likely to cultivate them. Few respondents reported owning wood lots. Again, this was attributed to the limited amount of land.

Reported rates of animal ownership varied across the vulnerability groups (Figure 4.6). Cattle, cows in particular, were the preferred livestock among community members and ownership was reported by significant numbers of residents across the groups. Cattle held a significant cultural worth for respondents (GA31; GA32; GA34; GA48; GA72; GA74; GA78). In addition, they were valued for the milk and they could be sold to help cover large expenses, including school fees and state mandated health insurance (GA37). Although respondents indicated that finding fodder was a livelihood stressor, there was not a similar sense that government restrictions on livestock rearing practices were impacting their livelihoods to the same degree as in Kabeza. Some interesting patterns emerged from cattle ownership. As indicated before, some SIL respondents did not keep livestock because of a lack of time and labor to dedicate to their upkeep. As in Kabeza, many farmers cared

for the livestock of others and in return received the offspring. While respondents from across all vulnerability groups participated in such caretaking, those with ARL-diversified and LRL participated at much higher rates - 12% and 18% respectively. Only one SIL and one ARL-ag dependent respondent reported taking care of others' livestock. These respondents did not participate as they already owned their livestock from which they could access milk and manure. In addition, as they had significant resources they had the ability to purchase livestock directly rather than waiting for an offspring from others' livestock. In addition, a significant number of respondents with ARL-ag dependent, ARL-diversified and LRL participated in or had previously participated in government programs that provided livestock to resource-poor households. This was reported by 24% of those with ARL-ag dependent, 21% of those with ARL-diversified and 12% of those with LRL (Some LRL respondents were on a waiting list to receive livestock from the government). Taken together, over a quarter of those reporting cattle ownership from the ARL-ag dependent, ARL-diversified, and LRL groups either fostered cattle for others, or their ownership was facilitated by state or NGO intervention.

Pigs were kept by respondents from all vulnerability groups, with very similar rates of engagement across all groups. Since pigs reproduced quickly, the sale of piglets on the market was a steady source of income that could be utilized to solve small urgent household needs (GA22; GA37; GA86). Sheep, goats and rabbits were reared for the same reasons. SIL respondents had the highest rates of ownership of poultry (42%). Poultry was additionally valued as a source of eggs. Poultry ownership showed an interesting pattern, declining across the vulnerability groups. The main reason provided for this was because of the lack of income to purchase additional animals.

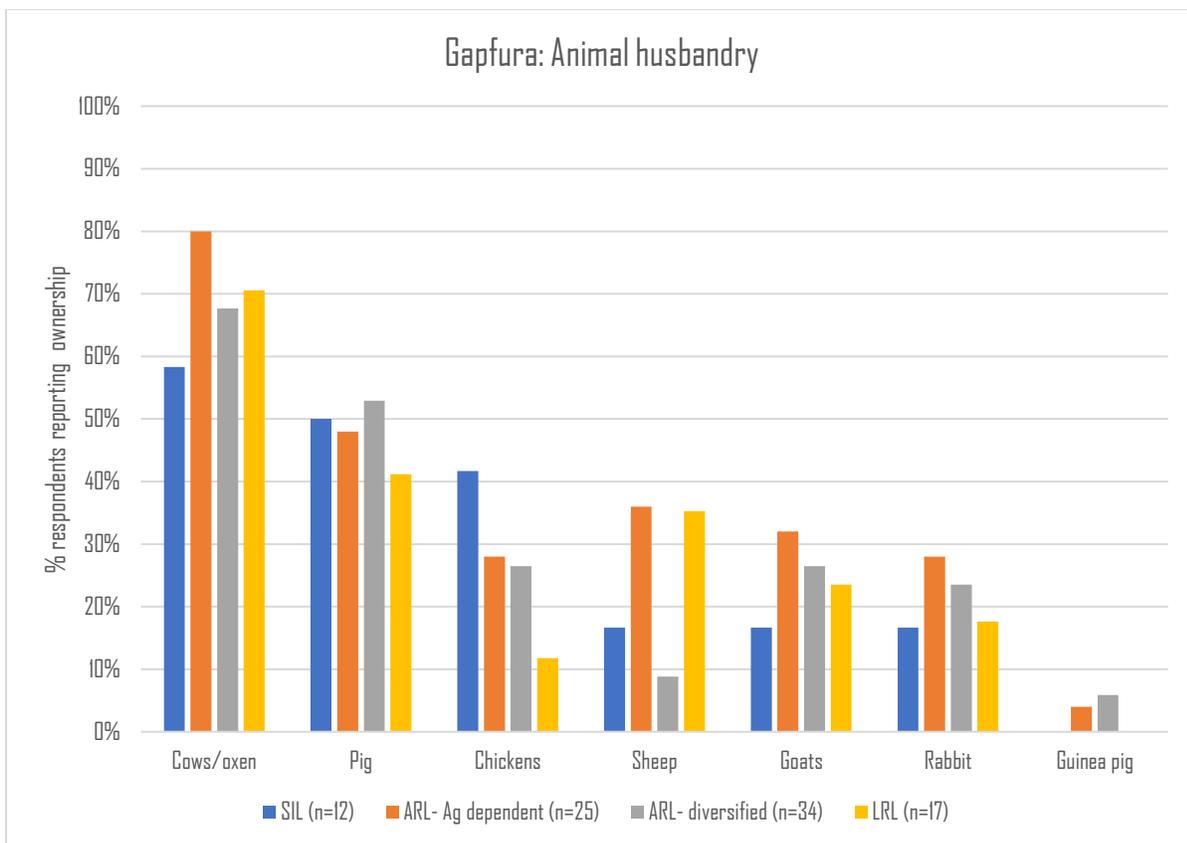


Figure 4.6: Animal ownership by vulnerability group

4.3.2 Summary: A Shared Discourse of Livelihoods

In Gapfura, livelihoods are centered on agricultural production and livestock husbandry. Those with SIL engage in nonfarm employment both to support these activities, and as a central activity unto itself. Those in other groups generally use nonfarm employment to support agriculture and livestock husbandry, without seeing such work as an adequate activity by itself. Agricultural production is predominantly focused on staple crops and vegetable production, with the goal of meeting the subsistence needs of the household. Surpluses are marketed, but only when possible. Most households own some significant livelihoods assets, such as larger animals, that can be mobilized to address shocks and stressors, and which provide a source of income or investment capital in agriculture if necessary. However, the stability that this asset ownership provides is, for many residents, a function of state intervention in the livelihoods of the community. Where the state has provided support, such as for cattle ownership, there is a high degree of similarity in the situations of members of all groups. Where the state is not engaged, such as in poultry ownership, the limitations of those with fewer assets and employment options become clearer as they lag their more secure, wealthy neighbors. To understand these patterns of activity, and their stated justifications, we must consider who is undertaking these activities, and the roles and responsibilities they seek to fulfill.

4.4 Gapfura: Subgroup Activities and Decisions

In Gapfura, much of the difference in the livelihood activities of those in different groups can be explained by access to livelihoods assets (which also explains why, due to significant state intervention, there are many strong similarities across the groups). However, there also exist important differences in the livelihoods activities, and therefore the particular ways in which people mobilize discourses of livelihoods in Gapfura, within these groups. By exploring the discourses of livelihoods of each of the four groups we can identify the specific activities associated with different individuals in Gapfura, allowing us to explore which activities are associated with particular identities, roles, and responsibilities under different assemblages of vulnerability.

4.4.1 Stable Income Livelihoods

All SIL respondents were engaged in farming (Figure 4.7). SIL men and women engaged in animal husbandry at very similar rates, but more men (80%) than women (57%) engaged in business activities. On the other hand, significantly more women than men engaged in formal employment. Sixty percent of SIL women reported having salaried employment, while only 29% of men were so employed. The majority of these women were employed as teachers. Men, on the other hand, reported a wide variety of formal activities. Women participated in cooperatives at more than double the rate of men. This was partially because these women had access to cooperative membership through their work and also because they also had a substantial source of independent income. A single woman reported leasing land to others, while one man reported participating in artisan activities.

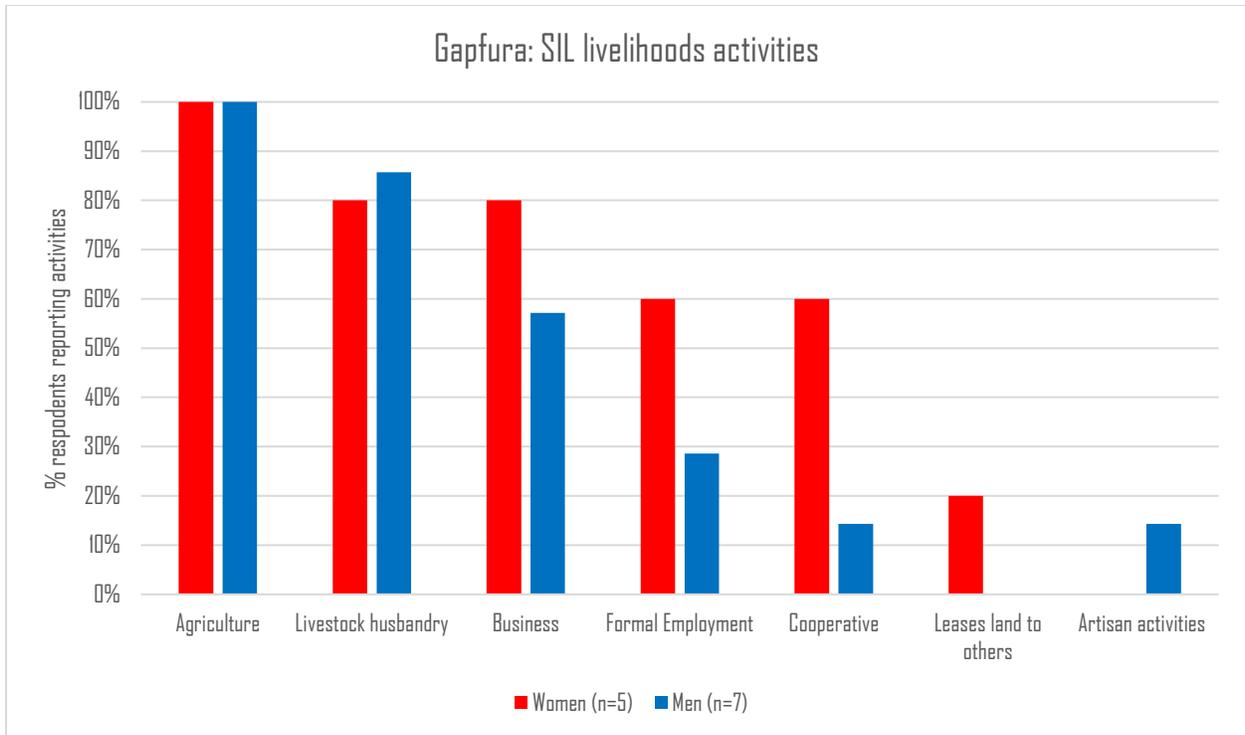


Figure 4.7: Livelihood activities reported by SIL respondents by gender, Gapfura

Crop selection among those with SIL reflects an effort to balance the demands of income generation and farming (Figure 4.8). Maize and beans were cultivated by all members of this group. Cassava, banana, yam and Irish potatoes were cultivated by more men than women, while sweet potatoes and eggplant were more frequently cultivated by women. All men reported cultivating four staple crops, and nearly all reported a fifth (sweet potato). Women, on the other hand, only reported universal participation in three crops. This suggests that, in this group, men were more engaged in agriculture than women, whose livelihoods incorporated significant formal employment that took them away from the farm.

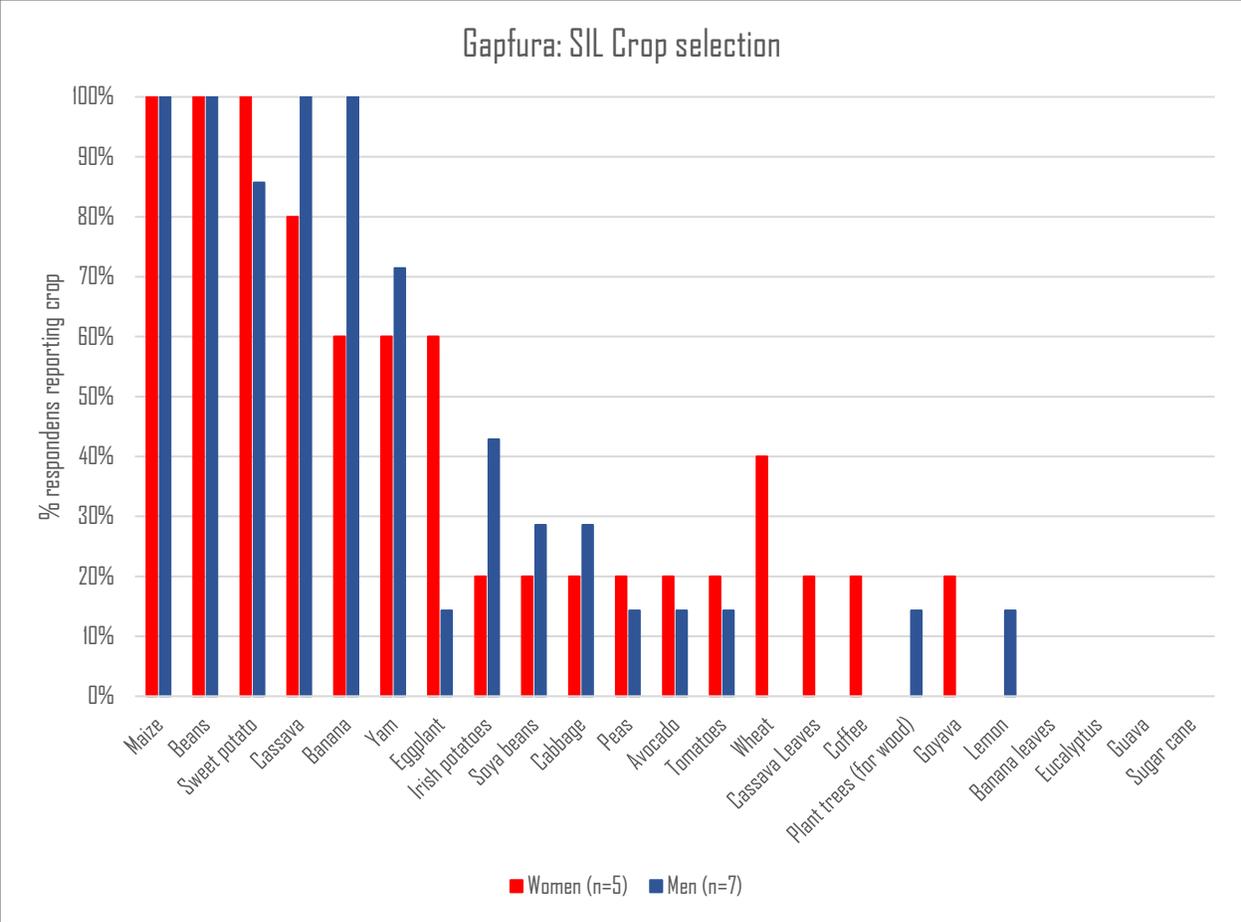


Figure 4.8: SIL crop selections by gender

While those with SIL cultivated relatively few crops, SIL men, in particular were more market-than other residents in their agricultural production (Figure 4.9). Even beans and maize, core staples principally cultivated for subsistence, generated marketable surpluses. For other staples, such as sweet potatoes and cassava, these surpluses were substantial enough to make these crops of equal use for subsistence and sale. In this group, vegetables are cultivated principally for consumption. There is little gendered difference in the reported use of these crops.

Reported crop uses: SIL

	Beans	Maize	Sweet Potato	Cassava	Banana	Amaranthus	Yam	Leeks	Eggplant	Soy	Irish Potatoes
SIL men	Eat more than sell	Eat more than sell	Eat and sell equally	Eat and sell equally	Sell more than eat	Eat all	Eat more than sell	Eat all	Eat all	Eat more than sell	Eat all
Sil women	Eat more than sell	Eat all	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell		Eat more than sell	Eat all	Eat and sell equally

	Cabbage	Peas	Carrots	Avocado	Onion	Tomatoes	Coffee	Wheat	Beetroot	Goyava	Lemon
SIL men	Eat and sell equally	Eat more than sell	Eat all	Sell more than eat	Eat all	Eat more than sell			Eat all		Sell more than eat
Sil women	Eat and sell equally	Eat all	Eat all	Sell more than eat			Sell all	Eat more than sell	Eat more than sell	Sell more than eat	

Figure 4.9: Reported crop uses by men and women with SIL.

Reported aggregated crop uses, however, mask tremendous complexity in the agricultural strategies of members of this group. For many of the crops cultivated, farmers selected more than one variety, and often each variety had specific uses.

Fewer maize varieties were cultivated in Gapfura than in Kabeza. All SIL respondents reported cultivating *Sunkorebo*. This variety was introduced by the government and farmers were both obliged and provided incentives to cultivate it. Respondents also indicated that the variety produced a good harvest. A 19-year-old SIL woman explained why she farmed the variety in this way:

On maize I farm *Sunkorebo* varieties because it is [in]the government program. In this village we are all required to plant that variety of maize because the government gives that variety to our farmer promoters to sell them in the village and teach people how it is supposed to be planted and when you buy 5kg of it they give you 5kg of inorganic fertilizer as a bonus, and also that variety gives us a good yield (GA79).

Of those who reported how they utilized their *Sunkorebo* harvest, 30% sold half of their harvest and ate half within the household. The remaining 70% reported eating more than they sold. There were no significant differences in the use of maize among men and women who reported how they used their harvest. Only one SIL respondent reported growing an additional maize variety - *Nyakagori*.

Although there was a wide variety of beans cultivated in Gapfura (respondents in the study grew 18 varieties), SIL respondents reported cultivating only five. The most commonly cultivated variety was *Inyumba*, most likely because seed for this variety was provided by the government (GA39). The variety was cultivated by 67% of SIL farmers. The second most commonly cultivated varieties were *Kijamarika* and *Nyiragateja*. They were each cultivated by 25% of SIL respondents. Most SIL respondents (58%) grew only one variety of beans, with the other 42% growing two or three varieties. Broadly speaking, farmers explained their selection of bean varieties as a product of the varieties' adaptation to the local environment, their suitability to the climate, the availability of seed, the yields they produced, and their suitability for household consumption. *Kijamarika* and *Nyiragateja* had the additional advantage of being pest resistant. All respondents who reported cultivating *Inyumba* ate more than they sold.

As with beans, we found farmers in Gapfura cultivating a wide range (15 in total) of sweet potato varieties. SIL respondents reported growing five. The most commonly grown variety was *Murigande*

(73%) followed by *Kirimadamu* (55%), and *Kiryamukungu* and *Seruruseke* which were each cultivated by 27% of those who cultivated sweet potatoes. With the exception of one respondent who cultivated one variety, SIL respondents cultivated between two and three sweet potato varieties. Varieties were selected because they provided a good harvest, were fairly resistant to pests and decay and were very sweet. Of those SIL respondents who reported how they use their harvest 60% ate half and sold half of their produce. Another 30% consumed more than they sold. Only one respondent sold more of their harvest than they consumed within the household.

Respondents in this vulnerability group grew a wide range of cassava varieties. Those with SIL cultivated all 11 cassava varieties reported by respondents in Gapfura. Among those who cultivated cassava, the most commonly grown variety was *Kivuteri* (82%). Cassava varieties were selected for their suitability to the local climate, their yield, and the sweetness of the tuber. Like beans and maize, cassava was primarily grown for consumption within the household, though surpluses were sold. Seventy-eight percent of respondents who reported the use of their harvest consumed more than they sold.

Respondents in the study grew 21 banana cultivars. SIL respondents reported growing 12 of these, but focused on the cultivation of two: *Inshakara* (reported by 80% of SIL respondents who grew banana) and *Mbogoya* (reported by 33%). According to respondents, banana varieties were selected for their yields and their suitability for the environment. The utilization of banana yield, unlike that of other crops, was dependent on the particular cultivar. *Inshakara* was cultivated for household consumption with the other cultivars primarily grown for sale. All SIL respondents who cultivated *Inshakara* consumed more than they sold while all respondents who grew other varieties sold more than they consumed.

Of the nine yam varieties reported by all respondents, SIL respondents principally cultivated one: *Amayanga*. The variety was cultivated by 75% of SIL respondents who grew yams. The variety was preferred because, according to farmers, it provided a good yield, was a short cycle variety, and was pest resistant. Those with SIL cultivated yam mainly for household consumption, with all respondents, except one, consuming more of their yam harvest than they sold. Overall, cassava and yam cultivation among those with SIL was geared towards consumption within the home, while banana cultivation reflected a balance between subsistence and income needs.

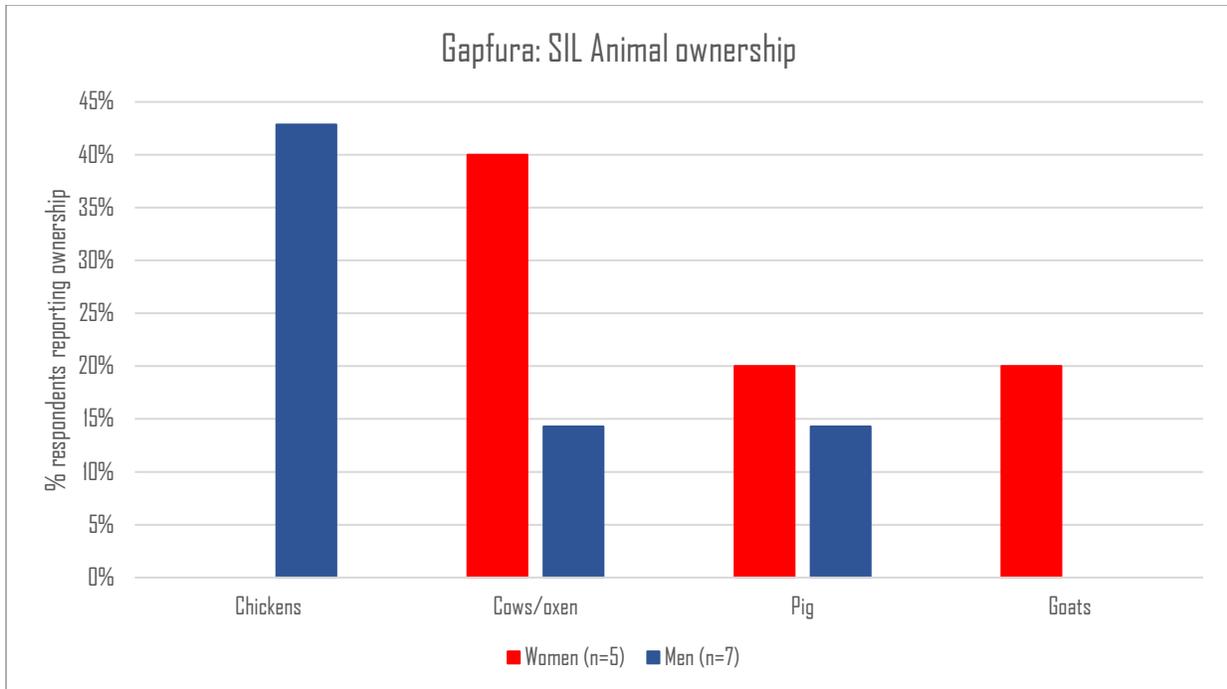


Figure 4.10: Reported animal ownership among those with SIL

Among those with SIL, reported animal ownership was relatively low Figure 4.10. Those who reported owning animals most frequently reported chickens and cows/oxen. Only men reported owning chickens, while women owned more cows/oxen than men. Women also exclusively owned goats. The low rate of animal ownership in this group, coupled with the fact that men focus their efforts on low-value animals like chickens, while women own the majority of the high-value animals, further suggests that for those with SIL business activities and non-farm employment were central to their livelihoods. While agriculture is important to both men and women in this group, women are more engaged in formal employment and the husbandry of larger, more valuable animals than men, suggesting they are less concerned with agriculture as a part of their livelihoods than their husbands.

4.4.2 Adequate Resource Livelihoods – Agriculture Dependent

All ARL-ag dependent respondents engaged in agriculture and animal husbandry (Figure 4.11). The rate of participation in animal husbandry is much higher than among those with SIL. While those with SIL often found animals a burden on their non-farm activities, those with ARL-ag dependent were able to acquire animals through livestock distribution programs and community livestock fostering arrangements. Over a quarter (28%) of ARL-ag dependent respondents participated in one or the other. Thirty percent of ARL-ag dependent women (compared to 80% of SIL women) and 33% of ARL-ag dependent men (compared to 57% of SIL men) participated in business activities. So, while among SIL respondents significantly more women than men had a business, among those with ARL-ag dependent the patterns were reversed. The much lower percentages of ARL-ag dependent respondents participating in business activities reflected their lack of sufficient capital to pay the taxes and extra costs for maintaining a business. As an example, an ARL-ag dependent woman explained why her bakery business failed:

I sell banana beers...in the past year I used to do the bakery but the tax was very high which caused me to have loss and I changed the [business]. I went to agricultural activities and livestock and also selling banana beers. Another thing that pushe[d] me to do agriculture and livestock is that I have land and it is the only thing many of us do in this community: (GA24 a 53-year-old ARL-ag dependent female farmer).

Half of ARL-ag dependent women and 33% of ARL-ag dependent men were members of a cooperative. Like those with SIL, the primary motivation for cooperative membership was the possibility of obtaining loans in case of emergencies or to enable large expenditures. Although the gendered patterns of participation in cooperatives by those with ARL-ag dependent mirrored those of SIL respondents, the rates of engagement among those with ARL-ag dependent were much lower overall. This also reflects the financial constraints faced by respondents in the latter vulnerability group. Artisan activities and informal wage work, on the other hand, were more important for ARL-ag dependent respondents than for SIL respondents. Forty percent of ARL-ag dependent men and 10% of ARL-ag dependent women reported artisan activities. Where none of the SIL respondents interviewed participated in informal wage work, both ARL-ag dependent women (40%) and men (33%) participated in informal wage labor.

These broad livelihood patterns suggest that ARL-ag dependent households were more likely to choose animal husbandry, including fostering other's livestock, and informal wage work as livelihood activities to supplement their agricultural efforts. In addition, ARL-ag dependent men were more reliant on artisan activities for supplemental income than among those with SIL because these activities required less financial capital than business activities.

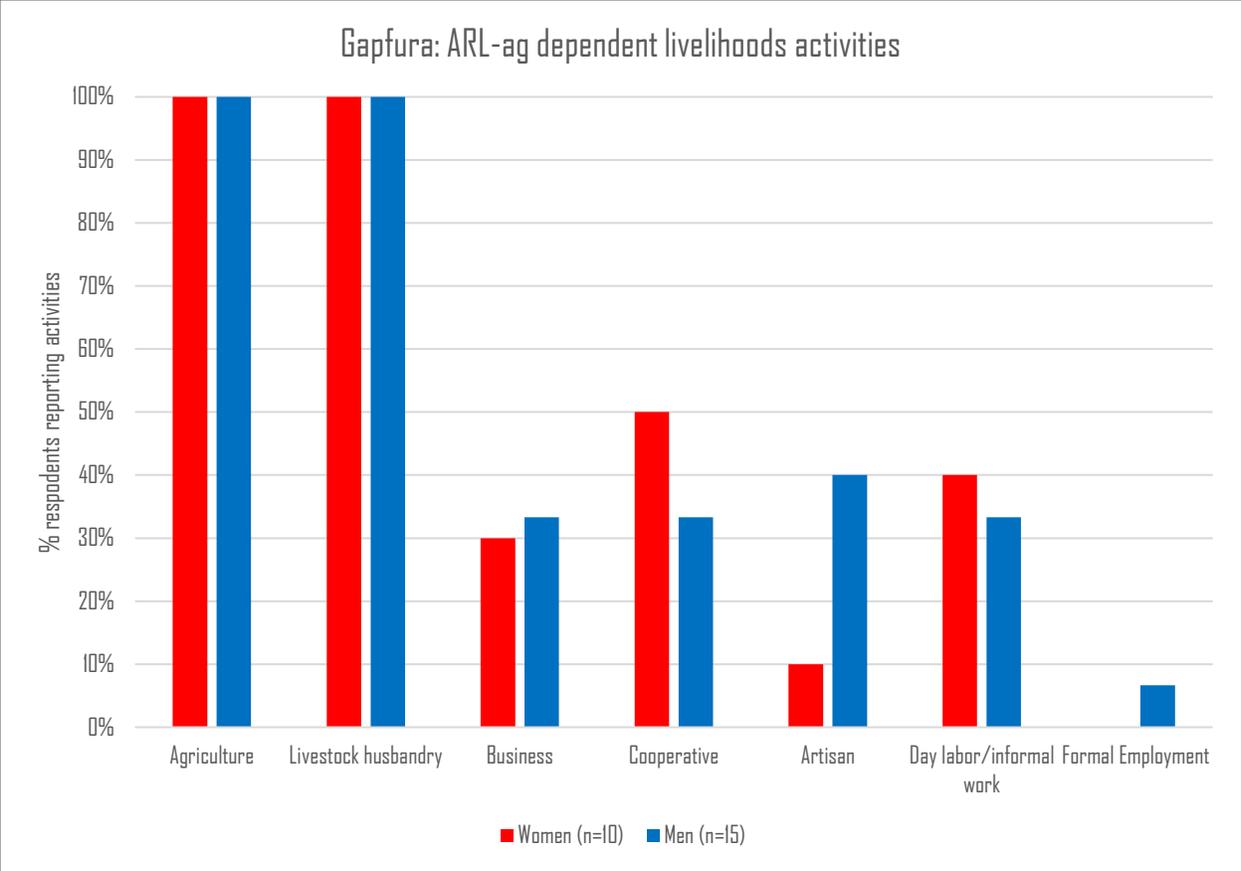


Figure 4.11: Livelihood activities for ARL-ag dependent respondents by gender, Gapfura

Crop and variety selection among those with ARL-ag dependent was similar to that seen among those with SIL in that it was geared towards household consumption with the sale of surpluses (Figure 4.12). All men and women cultivated maize, beans, bananas, and sweet potatoes, and nearly all cultivated cassava. A large percentage of men and women cultivated yams. There were few obviously gendered patterns of crop selection in this group. However, the larger number of crops farmed by both men and women, and the near-universal cultivation of five staple crops by those with ARL-ag dependent, suggests that agriculture was much more important to the livelihoods of this group than it was to those with SIL.

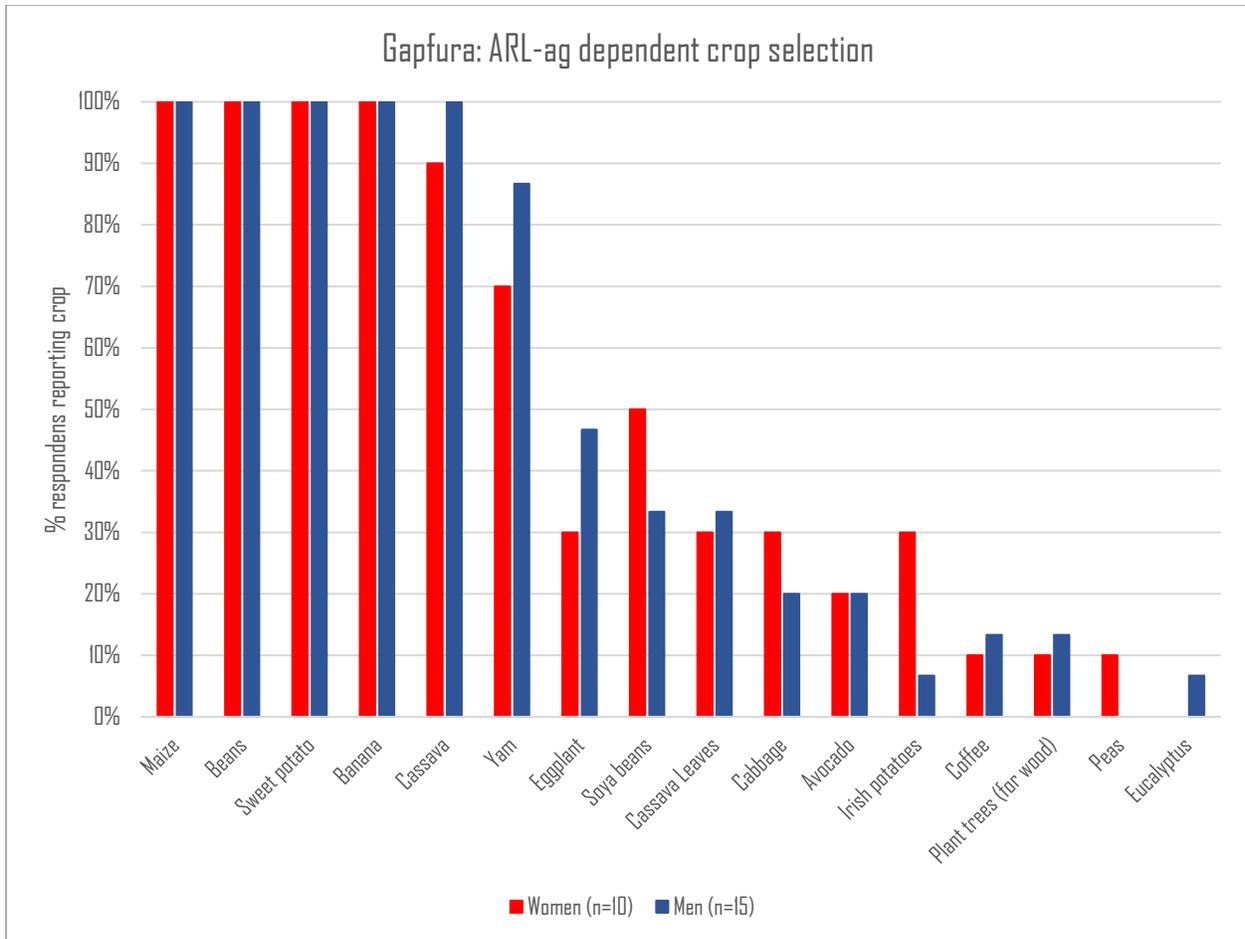


Figure 4.12: ARL-ag dependent crop selections by gender.

The agricultural production of those with ARL-ag dependent is focused on achieving subsistence, but individuals in this group are generally successful farmers who often produce marketable surpluses (Figure 4.13). Beans and maize are almost entirely used for subsistence, though these households generate marketable surpluses of cassava, bananas, and sweet potatoes. This suggests that in this group their capacity to generate marketable surpluses is somewhat less than that of those with SIL, but that such surpluses are still common. Nearly all vegetable crops cultivated by those with ARL are consumed in the household.

Reported crop uses: ARL-ag dependent

	Beans	Maize	Sweet Potato	Cassava	Banana	Amaranthus	Yam	Leeks	Eggplant	Soy
ARL-ag dependent men	Eat all	Eat all	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat all	Eat all
ARL-ag dependent women	Eat all	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat all

	Irish Potatoes	Cabbage	Peas	Carrots	Avocado	Onion	Chili	Coffee	Spinach
ARL-ag dependent men	Eat all	Eat all		Eat all	Eat and sell equally		Eat all	Sell all	Eat all
ARL-ag dependent women	Eat all	Eat all	Eat all	Eat all	Sell all	Eat all		Sell all	

Figure 4.13: Reported crop uses of men and women with ARL-ag dependent

As among those with SIL, residents of Gapfura with ARL-ag dependent selected various varieties of the crops described above, and used these varieties for particular purposes. *Sunkoreho* was the most-cultivated variety of maize, with all ARL-ag dependent respondents cultivating the variety. Thirteen ARL respondents (52%) reported eating all of their *Sunkoreho* harvest, with an additional 9 respondents (36%) of respondents eating more than they sold. More men (64% of ARL-ag dependent men reporting use) than women (50% of ARL-ag dependent women reporting use) ate all of their *Sunkoreho* harvest. However, it is not clear whether this represents a gendered pattern as more men (14%) reported that they sold and ate their produce equally while no women reported this.

Ten bean varieties were grown by respondents in this vulnerability group, double those grown by SIL respondents. However, one bean variety, *Inyumba*, was cultivated by 83% of ARL-ag dependent respondents. This was not only the most commonly cultivated variety, but was also the only variety that was grown by the majority of ARL-ag dependent respondents (75% of ARL respondents grew only one variety of beans). Interestingly, those respondents not growing *Inyumba* were more likely to be diversified, growing three bean varieties on average. Bean varieties were selected for their suitability to the local environment and their good yields. One respondent indicated that they selected bean varieties with a short maturity cycle. The majority of respondents in this vulnerability group (57%) ate all of their *Inyumba* harvest, 19% ate most and saved some for seed, while 24% ate more than they sold. There were no discernable gender differences in the utilization of beans.

ARL-ag dependent respondents were also more diversified in their sweet potato variety selection, cultivating 13 sweet potato varieties (SIL grew 5 varieties). The most commonly grown variety was *Kirimadamu* (cultivated by 88% of those who reported sweet potatoes), followed by *Murigande* (71%) and *Seruruseke* (33%) of those who cultivated sweet potatoes in this vulnerability group. Sixteen percent (n=4) respondents cultivated one variety, 36% (n=9) of respondents cultivated two varieties while the remaining 44% (n=11) respondents grew between three and five sweet potato varieties (one ARL-ag dependent respondent did not report information on variety use). ARL-ag dependent respondents selected varieties for the same reasons as those with SIL: they provided a good harvest, were fairly resistant to pests and decay, and were sweet. Among ARL-ag dependent respondents the crop was relied on both for household consumption and for sale. However sweet potato production among those with ARL-ag dependent was more oriented towards household consumption than among SIL respondents. Of those ARL-ag dependent respondents who reported how they use their harvest 58% ate more than they sold. Another 17% ate all of their harvest. Twenty five percent of

ARL-ag dependent respondents (much lower than 60% of SIL respondents) indicated that they ate and sold their produce equally. However, ARL-ag dependent women appear to be more market oriented in their sweet potato production with all, except one, of the respondents eating half and selling half of their produce being female.

Respondents in this vulnerability group grew 10 varieties of cassava, on par with the 11 varieties grown by those with SIL. The most commonly grown variety was *Kivuteri* (grown by all ARL-ag dependent respondents who grew cassava). Fifty four percent of ARL respondents who cultivated cassava also grew *Gacyara*. Only two ARL-ag dependent respondents reported growing one cassava variety. Sixty-three percent of those cultivating cassava grew two or three varieties. Another 29% grew between four and five varieties. Like those with SIL, those with ARL-ag dependent selected cassava varieties were selected based on the yield and sweetness. In parallel with SIL respondents, the crop was primarily grown for consumption within the household with the sale of surpluses. Seventy-one percent of respondents who reported the use of their harvest ate more than they sold with 29% eating and selling equally. There were no particular gendered patterns with regard to the use of cassava.

Respondents in this vulnerability group grew 10 banana varieties. By far the most commonly grown varieties were *Inshakara* (reported by 79% of those cultivating bananas) and *Mbogoya* (grown by 54%). Fifty-two percent of ARL-ag dependent respondents grew three or more banana varieties, 26% grew two varieties. ARL respondents were less market oriented in their banana production than those with SIL.

Two yam varieties were cultivated by ARL-ag dependent respondents: *Amayanga* and *Amabungubungu*. Over half of those who grew the tuber grew both varieties (59% of those who grew yams). The two varieties provided a good yield, were short cycle varieties and pest resistant. Yam was cultivated mainly for household consumption with the sale of surpluses. Yam production in this vulnerability group was more market oriented than among those with SIL. Forty seven percent of ARL-ag dependent respondents ate all of their harvest, 35% ate more than they sold and 18% sold more than ate.

It is clear that ARL-ag dependent respondents, on average, cultivate more crop varieties than those within SIL households. ARL-ag dependent respondents were also more likely to seek to sell their surpluses as fundamental strategy combined with business and artisan activities, and informal wage work, as a way to meet household expenses. A 77-year-old ARL-ag dependent man illustrated this as he explained how he endeavors to meet his household's need for money:

“I manage challenges by selling some of what I harvest like cassava, sweet potatoes, and beans, [I] sell some of domestic animals if there is, I sell avocados 1 time in [the] year where we can get 4000 RWF, [I] sell trees where one tree they give me 2000 RWF, my 2 daughters cultivate our land ...and sometimes they cultivate for others, my son works for others in construction activities and in carrying on head different things and in July, I cultivate the field of others where we share the yields equally but land is the wetland soil. I buy seeds and fertilizers. The money to buy them comes from selling domestic animals like sheep if [I have some], selling trees and sometimes we can sell beans (GA76).

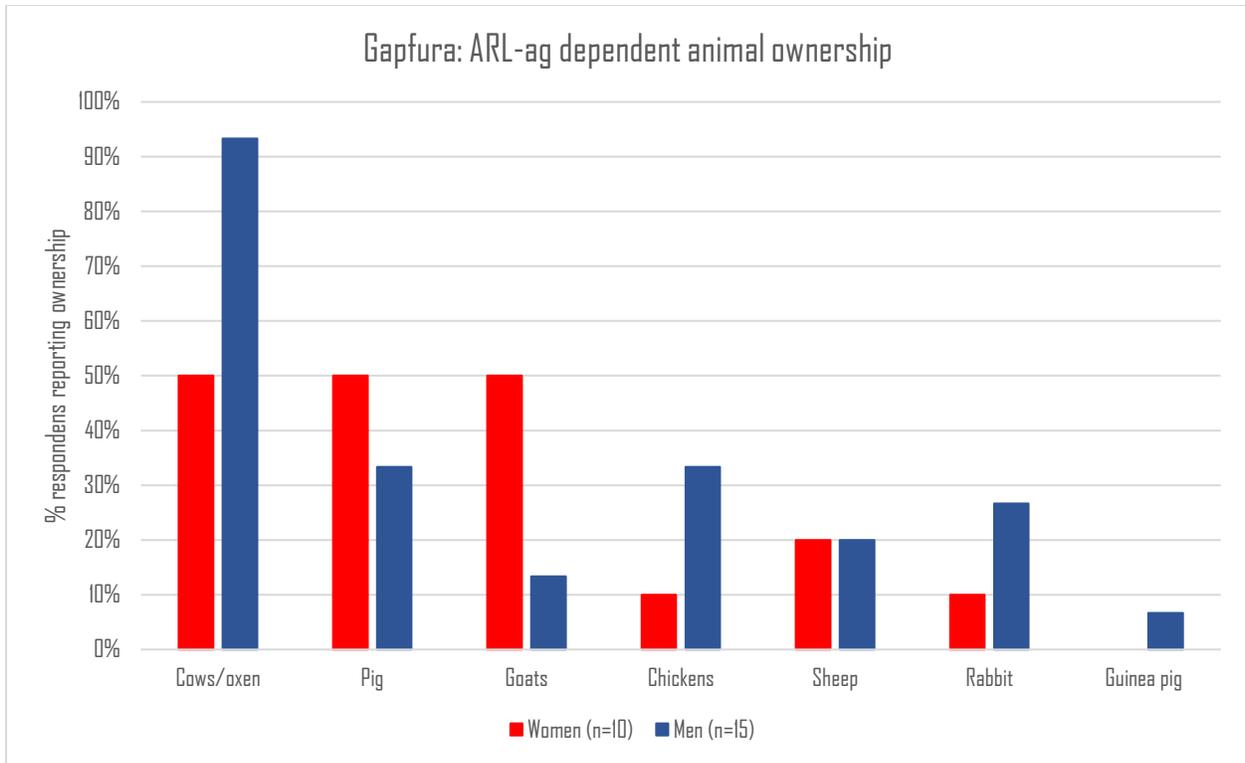


Figure 4.14: Reported animal ownership among those with ARL-ag dependent

Those with ARL-ag dependent report much higher rates of animal ownership than those with SIL (Figure 4.14). Further, this ownership is much more focused on larger, more valuable animals. Nearly all men reported owning cows/oxen. Half of the women in the group reported owning cows/oxen, pigs, and/or goats. This further suggests that those with ARL-ag dependent are much more focused on agriculture and animal husbandry in their livelihoods than those with SIL. This focus has allowed for the accumulation of significant livelihoods resources, such as large animals, that grants those with ARL significant livelihoods security.

4.4.3 Adequate Resource Livelihoods - Diversified

As with those with ARL-ag dependent livelihoods, all respondents with ARL-diversified engaged in agriculture (Figure 4.15). Eighty seven percent of women and 91% of men engaged in animal husbandry. These rates of engagement were slightly lower than those of ARL-ag dependent respondents but higher than SIL respondents. About a third (33%) of respondents in this group participated in livestock distribution programs or community livestock fostering arrangements. Respondents not keeping livestock in this vulnerability group lacked the finances to buy animals and to needed accommodation for them (GA10; GA12; GA13; GA34) or did not have the means to acquire fodder (GA14; GA20). One respondent worried that if he acquired additional animals they would be stolen (GA22). These explanations differ from those provided by those with SIL, and reveal these respondents to belong to households that are more resource constraints than those with SIL.

Respondents in this vulnerability group were less dependent than those with SIL but more engaged in business activities than those with ARL-ag dependent. Forty three percent of ARL-diversified women and 36% of men participated in business activities. These rates of engagement in business,

taken to together with observed patterns of animal husbandry, illustrate one way in which respondents with ARL-ag dependent and ARL-diversified have divergent livelihood strategies. While those with ARL-ag dependent favor animal husbandry, those with ARL-diversified are more likely to invest in business. Cooperative membership among ARL-diversified women (43%) was lower than among SIL and ARL-ag dependent women. Among ARL-diversified men however, membership in cooperatives (36%) was higher than among SIL and ARL-ag dependent men. This likely reflects a higher reliance of ARL-diversified men on loans from cooperatives both to regularly fund their livelihood activities and address emergency needs as well. Artisan work and informal wage labor was more important for those in this vulnerability group. Thirty percent of women and 64% of men with ARL-diversified participated in artisan activities while 70% of women and 64% of men were engaged in informal wage labor.

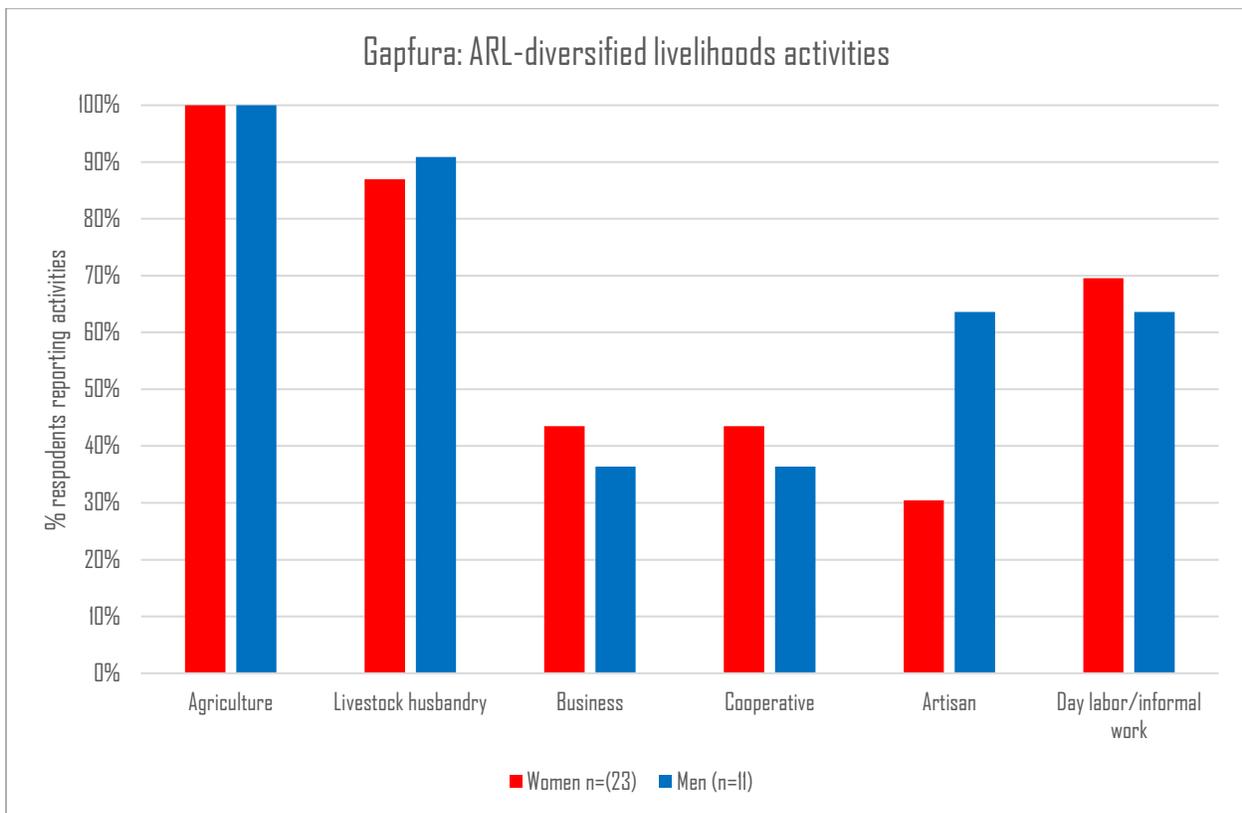


Figure 4.15: Livelihood activities for ARL-diversified respondents by gender

Crop selection among those with ARL-diversified, as among those with SIL and ARL-ag dependent, was geared towards both household consumption and the sale of surpluses (Figure 4.16). As among those with ARL, men reported near-universal participation in the cultivation of five crops, and very high rates of participation in a sixth. In this group, however, women also report near-universal cultivation of six crops, a much larger number than seen in either SIL or ARL-ag dependent. Overall, those with ARL-diversified have much more diverse farms than seen among those with SIL or ARL-ag dependent, suggesting significant investment in and reliance on agricultural production to meet household needs.

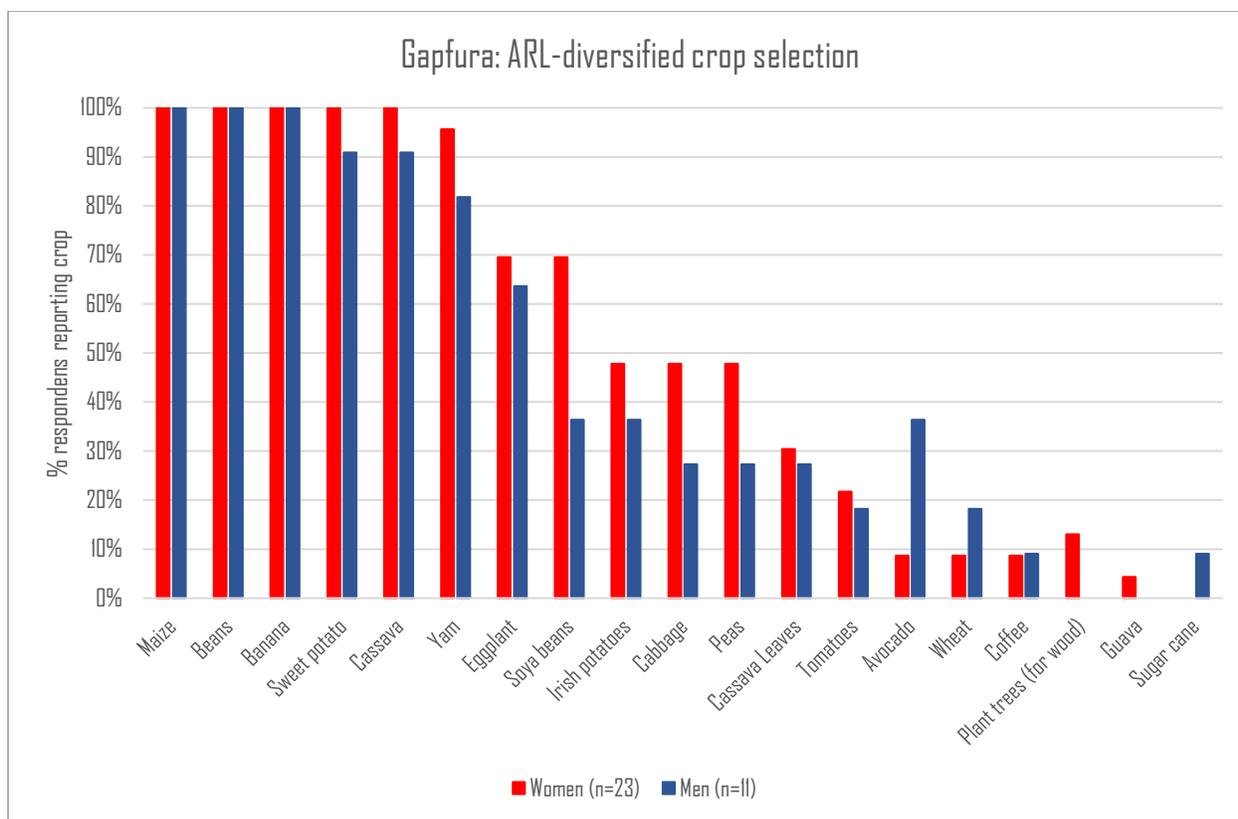


Figure 4.16: ARL-diversified crop selections by gender.

Those with ARL-diversified oriented the core of their agricultural production toward subsistence, and generally generated smaller surpluses of staple crops than seen among those with SIL and ARL-ag dependent (Figure 4.17). However, ARL-diversified farmers explicitly planted vegetable crops for market sale, using this production to shore up their incomes in a manner not seen in the other, more asset-secure groups.

Reported crop uses: ARL-diversified

	Beans	Maize	Sweet Potato	Cassava	Banana	Amaranthus	Yam	Leeks	Eggplant	Soy	Irish Potatoes
ARL-diversified men	Eat all	Eat more than sell	Eat more than sell	Eat more than sell	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat all	Eat more than sell	Eat all
ARL-diversified women	Eat all	Eat all	Eat and sell equally	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat more than sell	

	Cabbage	Peas	Carrots	Avocado	Tomatoes	Chili	Coffee	Wheat	Beetroot	Goyava
ARL-diversified men	Eat and sell equally	Eat all	Eat more than sell	Sell more than eat	Eat and sell equally	Sell more than eat	Sell all	Eat and sell equally		
ARL-diversified women	Eat more than sell	Eat more than sell	Eat all	Sell more than eat	Eat more than sell	Sell more than eat	Sell all	Eat more than sell	Eat all	Eat and sell equally

Figure 4.17: Reported crop uses of men and women with ARL-diversified

The variety selections of farmers with ARL-diversified reflect this nuanced shift in strategy. The *Sunkorebo* maize variety was cultivated by all ARL-diversified respondents with the exception of one female farmer. Another 12% of ARL-diversified respondents grew one or two more varieties, most likely *Nyakagori*, with *Sunkorebo*, with 54% of ARL-diversified respondents reported eating all of their

maize harvest and another 13% ate more than sold their harvest. Only two respondents in this group (5%) ate and sold their maize harvest equally. Some gendered preferences for the utilization of maize harvest emerged among those with ARL-diversified. The majority of those who reported consuming all of their harvest (83%) were women.

ARL-diversified respondents who grew beans were more diversified than SIL and ARL-ag dependent respondents. ARL-diversified respondents growing beans reported cultivating 12 bean varieties. Most ARL-diversified respondents, (71%), grew *Inyumba*. Other commonly grown bean varieties were *Inbutongufi* (cultivated by 32% of ARL-diversified respondents), *Kijamarika* (grown by 26% of respondents) and *Nyiragateja* (grown by 24% of respondents). Only 47% of ARL-diversified respondents grew one bean variety (compared to 75% of ARL-ag dependent respondents). The remaining 53% of respondents grew between two and five bean varieties. These bean varieties were selected for their suitability to the environment and good yield. Among ARL-diversified respondents, bean production was more subsistence oriented than among those with ARL and SIL. Seventy percent of respondents ate most of their bean harvest and 28% ate most and sold some of their harvest. There were no discernable gender differences in the use of bean harvest.

ARL-diversified respondents were also more diversified in their sweet potato variety selection than SIL respondents but closer in overall variety selection to those with ARL-ag dependent. Respondents with ARL-diversified grew 11 varieties of the crop compared to five among those with SIL and 13 among those with ARL-ag dependent. Two varieties, *Kirimadamu* and *Murigande*, were each cultivated by 81% of ARL-diversified respondents who grew sweet potatoes. The next most commonly-cultivated variety was *Seruruseke*, reported by 31% of ARL-diversified respondents growing sweet potatoes. Those ARL-diversified respondents who cultivated sweet potatoes often cultivated more varieties than those with ARL-ag dependent. 19% of ARL-diversified respondents growing sweet potatoes, mostly women, cultivated one variety. Half of ARL-diversified respondents cultivated two varieties (36% of those with ARL-ag dependent grew two varieties) while 39% cultivated between three and five varieties. Varieties were selected for the same reasons as among those with SIL and ARL-ag dependent. Unlike those with ARL-ag dependent (where only 25% of respondents ate and sold half of their produce), production of this crop among those with ARL-diversified was more oriented towards sale. A little less than half (47%) of ARL-diversified respondents growing sweet potato reported eating and selling their produce equally. Most of these (73%) were women. ARL-diversified women, like their ARL counterparts, appear to be more market oriented in their sweet potato production than men.

Respondents in this vulnerability group grew nine varieties of cassava, slightly fewer than those with SIL and ARL-ag dependent. The most commonly grown variety was *Kivuteri* (grown by 81% of ARL-diversified respondents who grew cassava). Fifty-three percent of ARL-diversified respondents cultivating cassava also grew *Gacyalyali*, *Rutanibisha* and *Imatarina*, each reported by 45% of ARL-diversified respondents who cultivated cassava. Two respondents grew one cassava variety. Most ARL-diversified respondents grew between two and three cassava varieties, with 23% of those who cultivated cassava growing as many as six varieties. Cassava varieties were selected based on the yield and sweetness, the same reasons provided by SIL and ARL-ag dependent respondents. In parallel with respondents from the previous two vulnerability groups, the crop was primarily grown for consumption within the household with the sale of surpluses. Seventy-one percent of ARL-diversified respondents who reported the use of their harvest ate more than they sold, 19% reported eating and selling equally, 6% sold more than they ate and 4% ate all of their harvest. All male respondents ate most or all of their harvest.

Respondents in this vulnerability group grew 17 banana varieties. Similar to those with SIL and ARL-diversified, by far the most commonly grown varieties were *Inshakara* (reported by 91%) and *Mbogoya* (grown by 53%). However, an additional two varieties, *Intuntu* (grown by 44% of respondents) and *Poyo* (grown by 41% of respondents) were also commonly grown by those with ARL-diversified. These cultivars were selected for the same reasons as among those with ARL-ag dependent and SIL. The banana production of ARL-diversified respondents was likely to be more diversified than that of ARL-ag dependent and SIL respondents. Seventy-four percent of ARL-diversified respondents grew three or more banana varieties. This compared to 52% among those with ARL-ag dependent and 40% among those with SIL. Overall 30% of ARL-diversified respondents were likely to sell most and eat some of their banana harvest, 22% were likely to eat most of their harvest, 18% to sell and eat equally, 16% to eat all and 14% to sell all of their harvest. When these figures were desegregated by particular cultivar, we found widely varied preferences for how respondents used their *Inshakara* and *Mbogoya* harvests compared to other cultivars. There were no appreciable differences in the percentage of respondents who reported that they ate all, ate most, sold and ate equally or sold most of their harvest. *Intuntu* and *Poyo* production on the other hand was more market oriented with most respondents reporting they ate and sold equally, sold more and ate some or sold all of their *Inshakara* and *Mbogoya* harvest. The wider range of uses suggests that ARL-diversified respondents were more reliant on the sale of bananas for income to address emergency household needs than their SIL counterparts (who ate most of their harvest).

Three yam varieties were cultivated by ARL-diversified respondents. The most commonly cultivated were *Amayanga* and *Amabungubungu*. Ninety seven percent of respondents growing cassava grew *Amayanga* while 47% of respondents grew *Amabungubungu*. Over half, 53% of respondents grew only one variety. ARL-diversified respondents appear to be less diversified in their yam production than ARL-ag dependent respondents. Although cultivated mostly for household consumption with the sale of surpluses, yam production among those with ARL-diversified was also more market oriented than among those with ARL, with more respondents in this vulnerability group reporting that they sold some of their harvest. Sixty seven percent of ARL-diversified respondents ate most of their yam harvest and sold some and 30% ate all (compared to 47% of ARL-ag dependent respondents who ate all).

The average ARL-diversified respondent, like the average ARL-ag dependent respondent, cultivated more crop varieties than those within SIL households. They were also more likely to seek to sell their surpluses to supplement income from other nonfarm activities. However, among these households there seems to be a slight drop in the number of varieties that are cultivated per crop. This is particularly so for crops that respondents reported, such as cassava and yam. The slight drop in variety selection is likely related to more limited access to land among those with ARL-diversified compared to those in ARL-ag dependent. These limitations in fundamental resources needed to engage in agriculture is also reflected in the higher engagement of these respondents in all livelihood activities outside of farming and animal husbandry (with the exception of formal employment).

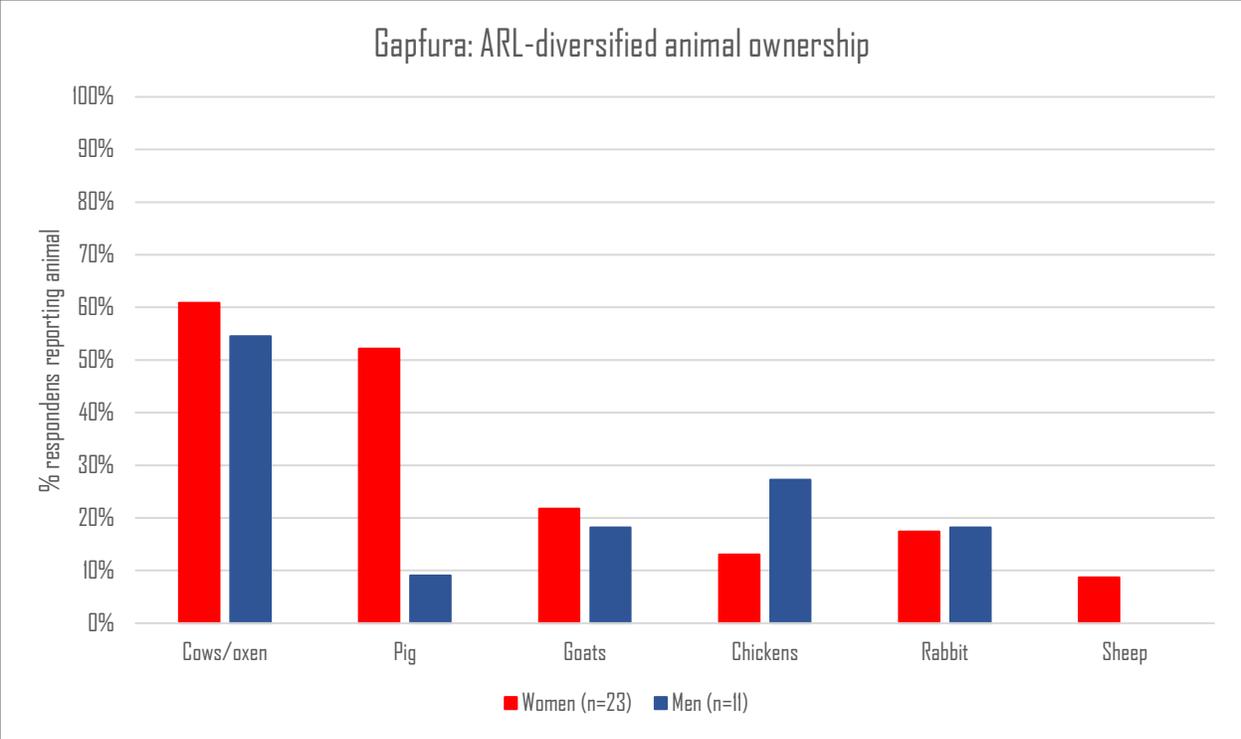


Figure 4.18: Reported animal ownership among those with ARL-diversified.

Animal ownership among those with ARL-diversified is somewhat similar to that seen among those with ARL-ag dependent, principally in a focus on the ownership of larger, more valuable animals (Figure 4.18). Rates of ownership among those with ARL-diversified are, on the whole, lower than among those with ARL-ag dependent. Taken together, the crop selections and patterns of animal ownership of those with ARL-diversified suggest individuals who are reliant on agriculture and animal husbandry for their livelihoods in a manner similar to that seen among those with ARL-ag dependent, but they have fewer assets to show for their efforts, and therefore are somewhat more precarious when faced with shocks and stressors. Their greater participation in day labor and informal labor, and lower rates of participation in business activities, further support the picture of individuals who are frequently asset-challenged.

4.4.4 Limited Resource Livelihoods

As with respondents in previous vulnerability groups, all those with LRL engaged in agriculture (Figure 4.19). All LRL respondents were also engaged in animal husbandry. These rates of engagement were higher than those with SIL and ARL-diversified but on par with those in ARL-ag dependent. Twenty percent of respondents in this group participated in livestock distribution programs or community livestock fostering arrangements, a rate somewhat lower than reported among ARL-ag dependent and ARL-diversified residents. Of the four vulnerability groups, LRL respondents had the lowest rates of engagement in business activities, and only women in this group were engaged in business activities. LRL participation in cooperative activity was also the lowest across all vulnerability groups, and again only women reported they were part of a cooperative. These low rates of participation in business and cooperative activity are an indication of the severely constrained financial resources in these households. On the other hand, only men (40% of LRL men) participated in artisan activities. Eighty three percent of women and all LRL men participated in informal wage labor. These patterns, taken together, suggest that the limited financial and labor

resources in these households force residents to focus heavily on agriculture and livestock husbandry, and to put their resources into a very limited number of non-farm activities.

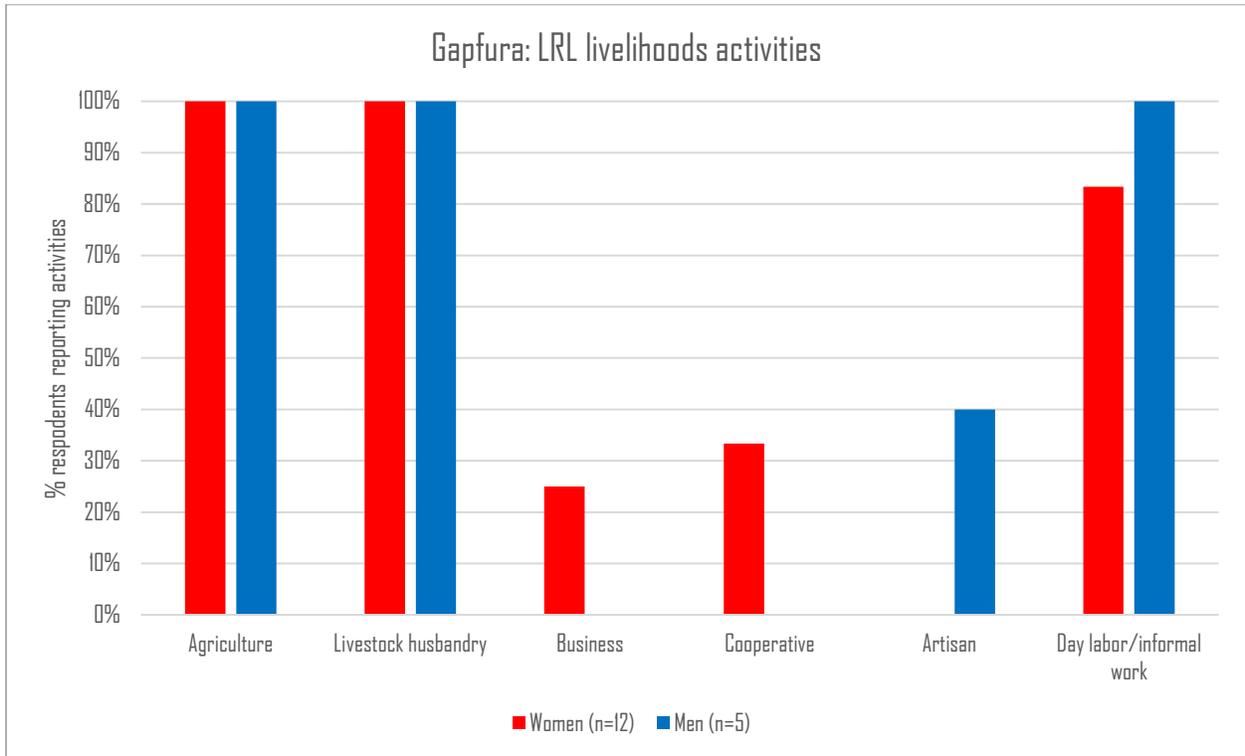


Figure 4.19: Livelihood activities for LRL respondents by gender

Crop and crop variety selection among those with LRL was similar to those in other vulnerability groups in that it was geared towards both household consumption and sale (Figure 4.20). However, this group's selections suggest both challenges related to access to livelihoods assets and greater precarity in production. First, the average farmer with LRL cultivates fewer crops than those with ARL-ag dependent or ARL-diversified, even though they are heavily reliant on agriculture for their income and food. Men report the universal cultivation of five staple crops, while women report this for three crops. The fact that this group is highly dependent on agriculture, but are cultivating fewer crops than those in other groups, suggests they have limited access to land and other assets that would facilitate more diverse crop selections.

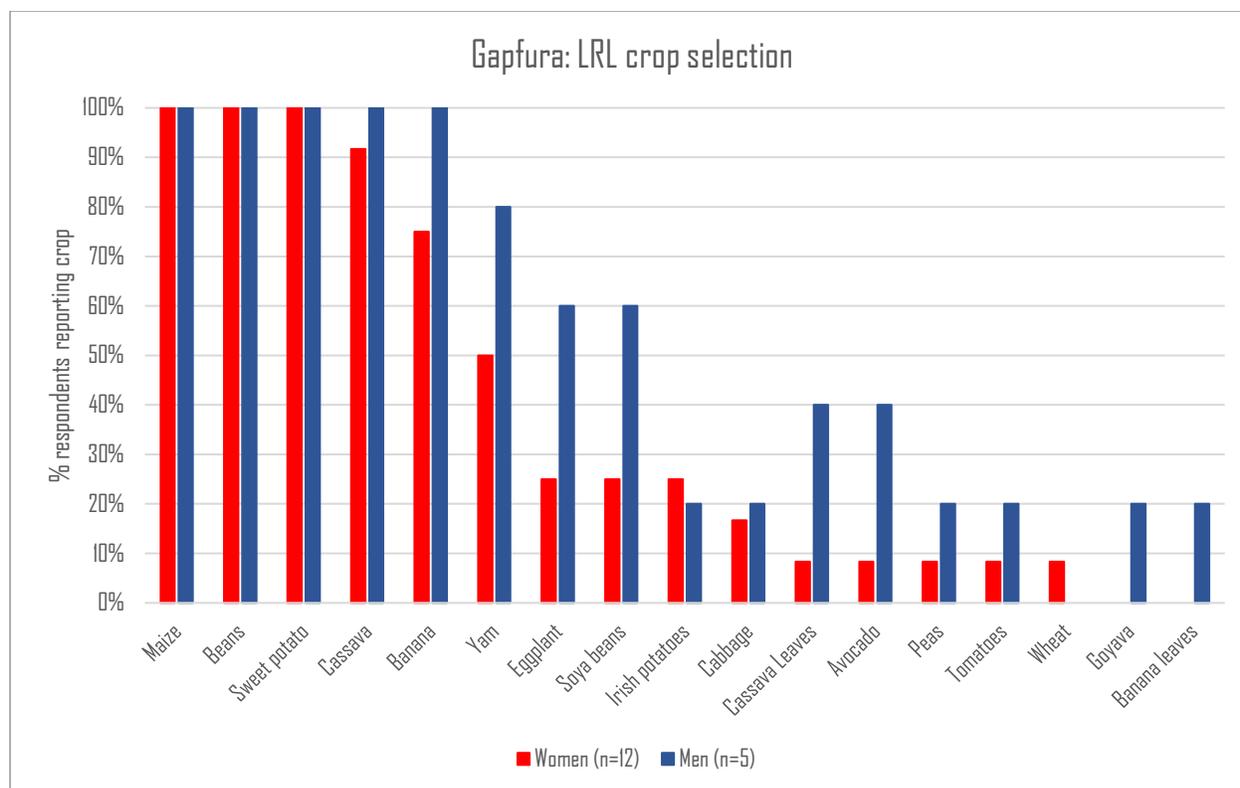


Figure 4.20: LRL crop selections by gender.

Those with LRL were the most subsistence-oriented of all groups in Gapfura (Figure 4.21). They consumed nearly all of the beans and maize they cultivated, and while they produced marketable surpluses of banana, cassava, and sweet potato, there were few marketable surpluses beyond these crops. On the whole, the group cultivated vegetables for consumption, with the exception of avocados, which were principally grown for sale. However, only 18% of those in this group reported cultivating this crop.

	Beans	Maize	Sweet Potato	Cassava	Banana	Amaranthus	Yam	Leeks	Eggplant	Soy
LRL men	Eat all	Eat all	Eat and sell equally	Eat more than sell	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat more than sell	Eat more than sell
LRL women	Eat all	Eat more than sell	Eat more than sell	Eat and sell equally	Eat and sell equally	Eat all	Eat more than sell	Eat all	Eat all	Eat all

	Irish Potatoes	Cabbage	Peas	Carrots	Avocado	Onion	Tomatoes	Chili	Wheat	Goyava
LRL men	Eat all	Eat all	Eat all	Eat all	Sell more than eat	Eat more than sell	Eat all			Eat and sell equally
LRL women	Eat all	Eat all	Eat all	Eat all	Sell more than eat	Eat all	Eat all	Eat all	Eat all	

Figure 4.21: Reported crop uses of men and women with LRL

Sunkorebo maize variety was cultivated by all LRL respondents with the exception of one farmer. Sixty nine percent of LRL farmers grew only this variety of maize. Another 25% grew *Sunkorebo* with

one more variety, likely *Nyakagori*. Sixty four percent of LRL respondents reported eating all of their harvest, the highest rate of the four vulnerability groups. Another 31% ate most and sold some of their maize harvest. We found no gendered preferences for the utilization of maize harvest in this vulnerability group.

LRL respondents who grew beans were less diversified than ARL-ag dependent and ARL-diversified respondents. Respondents in this vulnerability grew five bean varieties, the same number of varieties as SIL respondents. All LRL respondents cultivated *Inyumba* and 41% *Inbutongufi*. Just over half of LRL respondents grew one bean variety, a higher rate than those in ARL-diversified but lower than that of ARL. The percentage of LRL growing only one variety, however, was closer to that of SIL respondents (53%). As within the other vulnerability groups, LRL respondents selected bean varieties for their suitability to the local environment and their yields. Bean production among those with LRL was geared principally towards household consumption, with some sale of surpluses. Fifty three percent of respondents ate all of their harvest. The remaining 47% ate most and sold some of their harvest. There were no discernable gender differences in the use of bean harvest.

LRL respondents grew seven varieties of sweet potato, a much smaller variety selection than that of ARL-ag dependent (13 varieties) and ARL-diversified (11 varieties) respondents. This was however closer to variety selection among SIL respondents who grew five varieties. Respondents with ARL-diversified grew 11 varieties of the crop compared to five among those with SIL and 13 among those with ARL. Two varieties, *Kirimadamu* and *Murigande*, were each cultivated by 94% of LRL respondents. The next most commonly grown variety was *Seruruseke*, cultivated by 44% of LRL respondents. LRL respondents were the most diversified when it came to variety selection. Most (59%) cultivated three varieties, 35% grew two varieties and only 4% grew one variety. When considered in the context of sweet potato cultivation trends across the other vulnerability groups, it appears that as land availability and asset ownership decreased, Gapfura residents were forced to hedge their harvest bets and therefore grow more varieties per household. LRL respondents were more subsistence oriented in their sweet potato production than those within other vulnerability groups. Seventy six percent of LRL respondents ate most of their harvest, 18% ate half and sold half and 6% sold more than they ate.

Respondents in this vulnerability group grew seven varieties of cassava. The most commonly grown variety was *Kivuteri* (grown by 88% of LRL respondents who grew cassava). Sixty three percent of LRL respondents cultivating cassava also grew *Imatarina* and 50% grew *Gacyala*. Thirteen percent of respondents in this vulnerability group grew one cassava variety with the rest cultivating between two and four varieties. In parallel with respondents from the previous two vulnerability groups, cassava was grown primarily for consumption within the household, with limited sale of surpluses. Forty four percent of LRL respondents who reported the use of their harvest ate more than they sold, 25% reported eating and selling equally, 25% ate all of their harvest.

Among farmers with LRL, 88% cultivated *Inshakara* bananas, 63% *Intutu*, and 50% *Mbogoya*. The reported uses of banana harvest among those in this vulnerability group was varied. Twenty six percent of LRL respondents ate half and sold half of their harvest, 24% ate most of their harvest and sold some, 21% sold all of their harvest, 16% sold most of their harvest and 13% ate all. Bananas for those with LRL seem to serve the same purpose as among those with ARL-diversified where production was sold or consumed within the household based on the immediate or particular need for the household.

LRL farmers cultivated yams at the lowest rates. LRL farmers indicated that this was because yams, cassava and sweet potatoes were interchangeable. Given the challenges in accessing secure land, and limited labor and financial resources for those with LRL, they were households were forced to choose among these crops. LRL farmers grew two varieties of yams, *Amayanga* and *Amabungubungu*. All LRL respondents cultivating yam grew *Amayanga*. *Amabungubungu* was cultivated by 50% of those who grew yams. Forty three percent of LRL respondents who grew yams ate all of their harvest. Another 29% ate most and sold some.

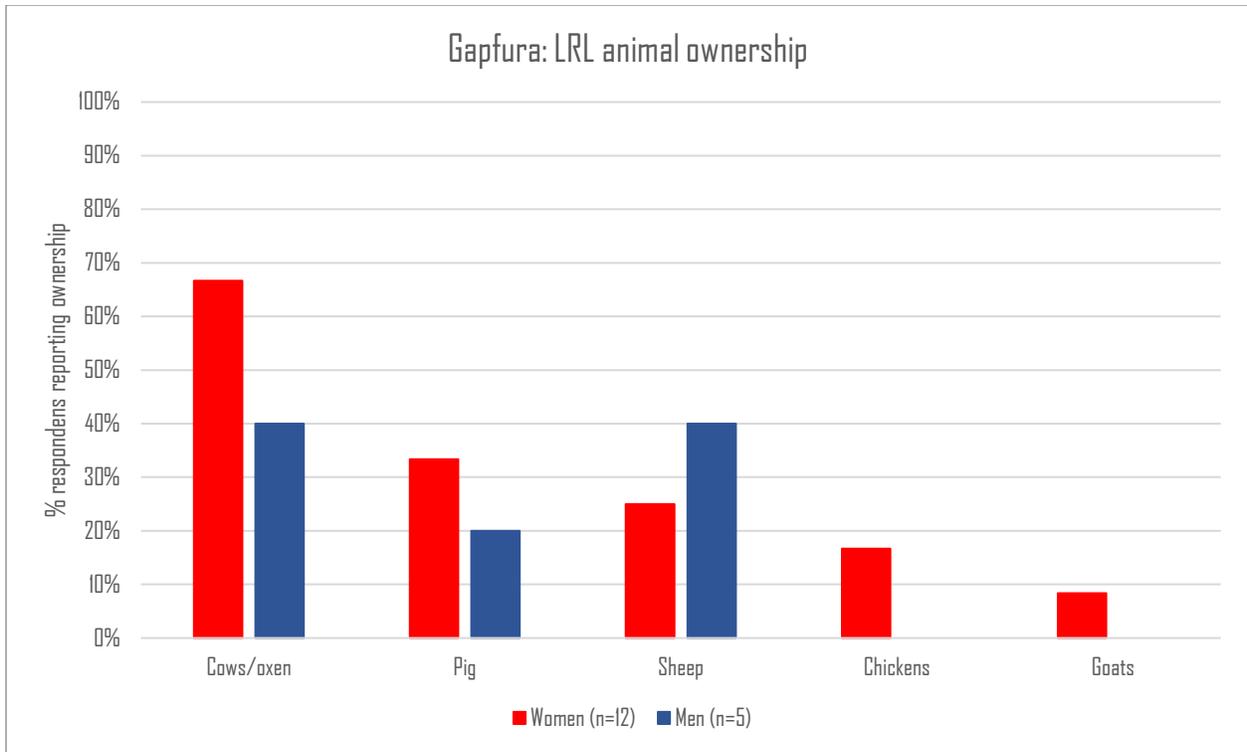


Figure 4.22: Reported animal ownership among those with LRL

Reported rates of animal ownership among those with LRL (Figure 4.22) are, at first glance, surprising. Members of this group report high rates of large, valuable animal ownership, something that is unexpected for individuals who appear to be asset-challenged in other aspects of their livelihoods. However, this animal ownership is a product of state intervention and the husbandry of others' animals. In short, state intervention provides a significant asset to many of those with LRL, but the overall picture of livelihoods activities in this group is not one of great security, suggesting that this asset introduction alone has not had a transformative impact on their lives.

4.4.5. Summary: Discourses of Livelihoods in Gapfura

In Gapfura, agriculture was a core livelihood activity. For most residents of Gapfura, agriculture was also the primary livelihood activity. However, for those with stable formal employment, agriculture was a secondary but still important activity. Agriculture was important both for feeding the household and as a source of income through the sale of surpluses. Business and artisan activities were important as a source of income for households but also because they were flexible activities in which respondents could participate with varying levels of capital and time. Cooperative activity was particularly important for women with women participating at higher rates across the four

vulnerability groups. Informal wage labor was particularly important for those with LRL as a way to earn money for the household.

4.5 Tools of coercion in Gapfura

The intersection of social roles and responsibilities with what is deemed to be the appropriate conduct of particular livelihoods activities in Gapfura created a strong set of “social facts”, framings of the world seen as valid and true and which set general boundaries for possible actions and thoughts in everyday life. While these social facts provide a strong explanatory framework for the patterns of activity and behavior observed in Gapfura, they are not sufficient to explain very regular patterns of behavior in this community, and within particular groups in the community. The social facts in play in Gapfura do not benefit all residents of this community equally. To better understand these regular patterns, and to understand the degree to which they might be malleable, we sought to understand how these social facts were policed: how community members were rewarded for living up to the expectations of their identity, or sanctioned for choices that did not align with these expectations.

In Gapfura, engaging in domestic disputes, drinking too much, and generally having a bad attitude towards others was considered unacceptable behavior (GA53; GA54; GA56). Respondents also agreed that an undesirable spouse (either a husband or wife) was one who did not work for the benefit of their family (GA53; GA55), did not demonstrate love for their family in the expected ways (GA54), was not clean (GA57, did not keep household secrets (GA53) and was adulterous (GA82). This undesirability extended to men who used the services of prostitutes (GA56). According to residents, a bad youth consumed drugs and was disobedient (GA55) while problematic elders (both men and women) were unkind (GA57) and did not give advice to others (GA56)

There was agreement among most community members about what social sanctions could be used to shape the behavior of community and household members who failed to meet their responsibilities. Household members who dissented from decisions arrived at within the household or were not meeting expectations faced an escalating set of social sanctions. It is clear that the social system in Gapfura, as in Kabeza, relied heavily on an internalized set of social sanctions. The first sanction was self-imposed, in that household members were deeply ashamed to be the cause of disputes within the home. Indeed, disputes in and of themselves were the most mentioned *consequence* of household members not meeting their responsibilities (GA04; GA06; GA08; GA15; GA16; GA23; GA25; GA26; GA41; GA50; GA82; GA83; GA85). An overwhelming majority of those interviewed reported that domestic disputes and fighting in the household would develop if a household member, whether a man or a woman, went against decisions that were jointly made within the households or failed to live up to their roles or responsibilities. If a dispute within the home did occur, then the ideal was for one of the arguing parties to compromise (GA28). If there were continued arguments and disputes within the home then divorce, while undesirable, became an acceptable option (GA30) even if, as a consequence, the person in question would lose their family (GA21; GA29; GA74).

At the community level, those who did not meet their responsibilities to their household members and to others within the community were at risk of losing respect within the community (GA03; GA15; GA31; GA33; GA45; GA59; GA69).). If their actions did not improve then others lost hope in their ability to transform and change (GA36; GA48; GA49). They then faced a series of social

processes which would lead to their isolation within the community. For example, such a person lost his or her friendships (GA01; GA24; GA43; GA51). No one asked for advice from them (GA04; GA10; GA14; GA30; GA66). They were not invited to participate in nor welcome at community activities as they were not considered to be fit to live among others (GA11; GA12; GA19; GA64; GA68; GA79).

Respondents indicated that people behaving in undesirable ways were socially neglected (GA04; GA20; GA42; GA58; GA80; GA82; GA85) and did not have any support (GA45). Some respondents reported that those not fulfilling their responsibilities were no value to others (GA26; GA44; GA50) and were “considered as nothing” (GA16; GA24; GA32). No one talked to these individuals (GA05; GA07). It is important to mention that these sanctions were not only important as a way of regulating individual behavior, the community also saw them as a way of preserving the whole. That is community members who were neglectful of their responsibilities or behaved in other undesirable ways were considered to have lost their culture (GA06; GA20; GA56) but more importantly as contributing to the loss of a community culture (GA44).

If individuals persisted despite sanctions, they were asked to leave the community. This was, however, only the case only after facing other sanctions and being advised by those respected in the community. A 19-year-old woman respondent commented that “for someone who is recognized as a bad [person], they take them to the community meeting or family meeting to advise them and when they do not correct themselves they just let them as they are but they are not welcomed in the community” (GA79).

4.6 The use of agroecological information across vulnerability groups in Gapfura

In Gapfura, respondents reported reliance on a combination of information from other farmers, advice provided by experts, and personal experience to make agricultural and other livelihoods decisions (Figure 4.23). Ninety three percent of respondents reported acquiring information from other farmers to determine the onset of the season and which varieties to plant. Advice from experts included advice from agricultural promoters, sector agronomists, and local government or community meetings. These sources were often local focal points for PICSA. Seventy six percent of farmers reported using on this information. Interestingly, respondents indicated that this advice was overwhelmingly taken into consideration when making decisions about when to plant and which variety of maize to plant. Otherwise, farmers relied on advice from other farmers or on their own experience. A 37-year-old female farmer typified how respondents utilized different sources of information: “I decide what variety to plant by [sector agronomist] for maize but for other crops, I make my own decision and look to others when there is new variety which I don’t know” (GA10). Only 11% of farmers reported relying on personal experience to make agricultural decisions. This is a surprisingly low number and most likely reflects underreporting of this source of decision-making in the data. When they employed their personal experience, farmers in Gapfura used it to gauge the onset of the season rather than which variety to plant.

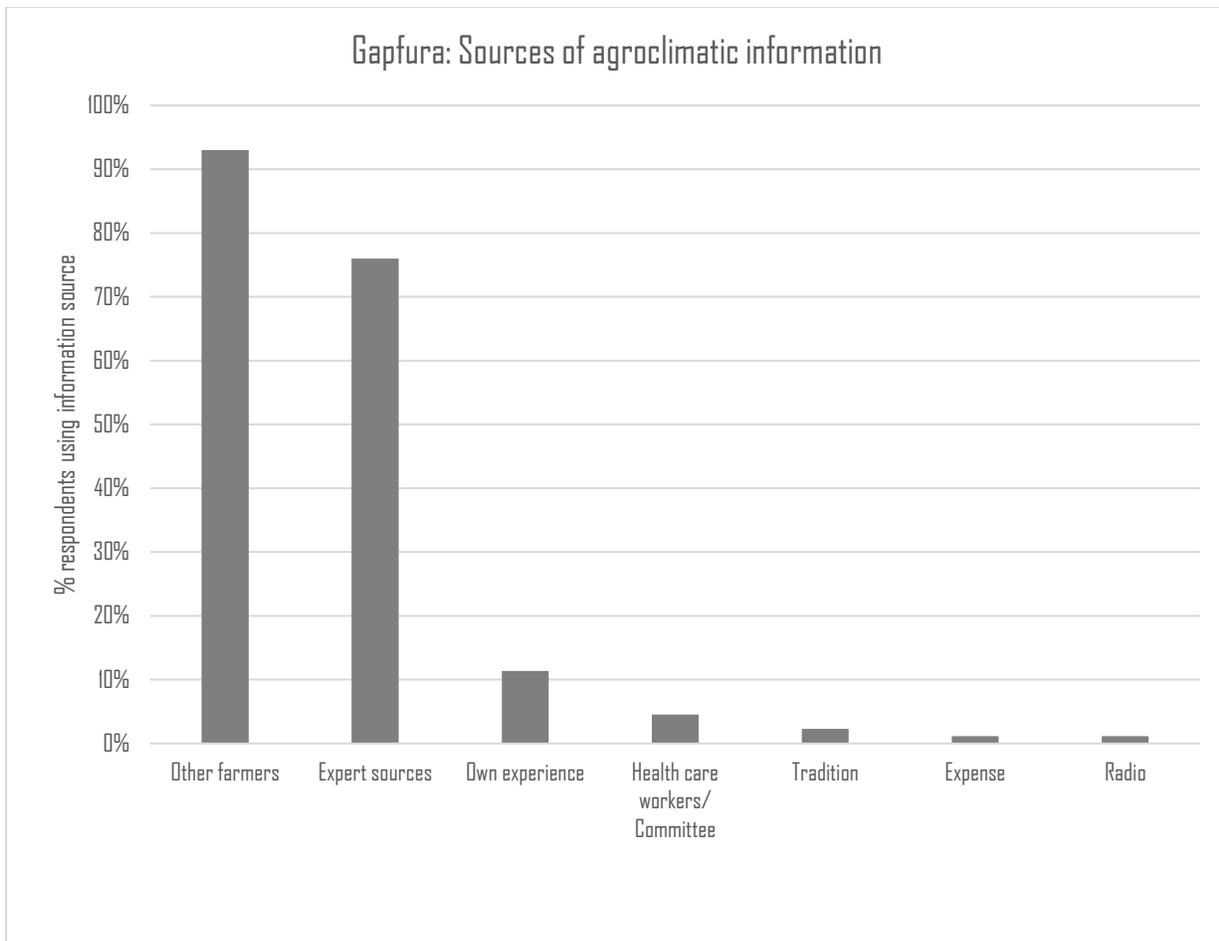


Figure 4.23: Sources of information used by residents of Gapfura to inform agricultural decisions

The reported sources of information was consistent across vulnerability groups (Figure 4.24). All LRL respondents relied on information from other farmers to make agricultural decisions. Most farmers from other vulnerability groups also looked to other farmers to make agricultural decisions. These included 83% of SIL farmers, 96% of ARL-ag dependent farmers and 91% of ARL-diversified farmers. All SIL and ARL-diversified respondents, 92% of respondents with ARL-ag dependent and 96% of respondents with LRL relied on expert advice. These patterns suggest that PICSA sources of information, agricultural extension agents in particular, align with the information needs of respondents across varying vulnerability groups. Only SIL, ARL-diversified and LRL respondents reported relying on own experience when making decisions on seasonal onset and which variety to grow. However, as noted above, this source of information is likely underreported in the data. Only SIL respondents reported considering the cost of the variety or recommended activity when making farming decisions. Members of this group were also the only respondents to report listening to the radio when making farming decisions. An interesting aspect of decision-making in Gapfura was the mention of health care workers as an important source of information on how to grow nutritious and healthy foods, for instance carrots or amaranth. Although those reporting relying on this source of information is small, it appears that that LRL respondents were more likely to take into consideration these sources of information in making their agricultural decisions.

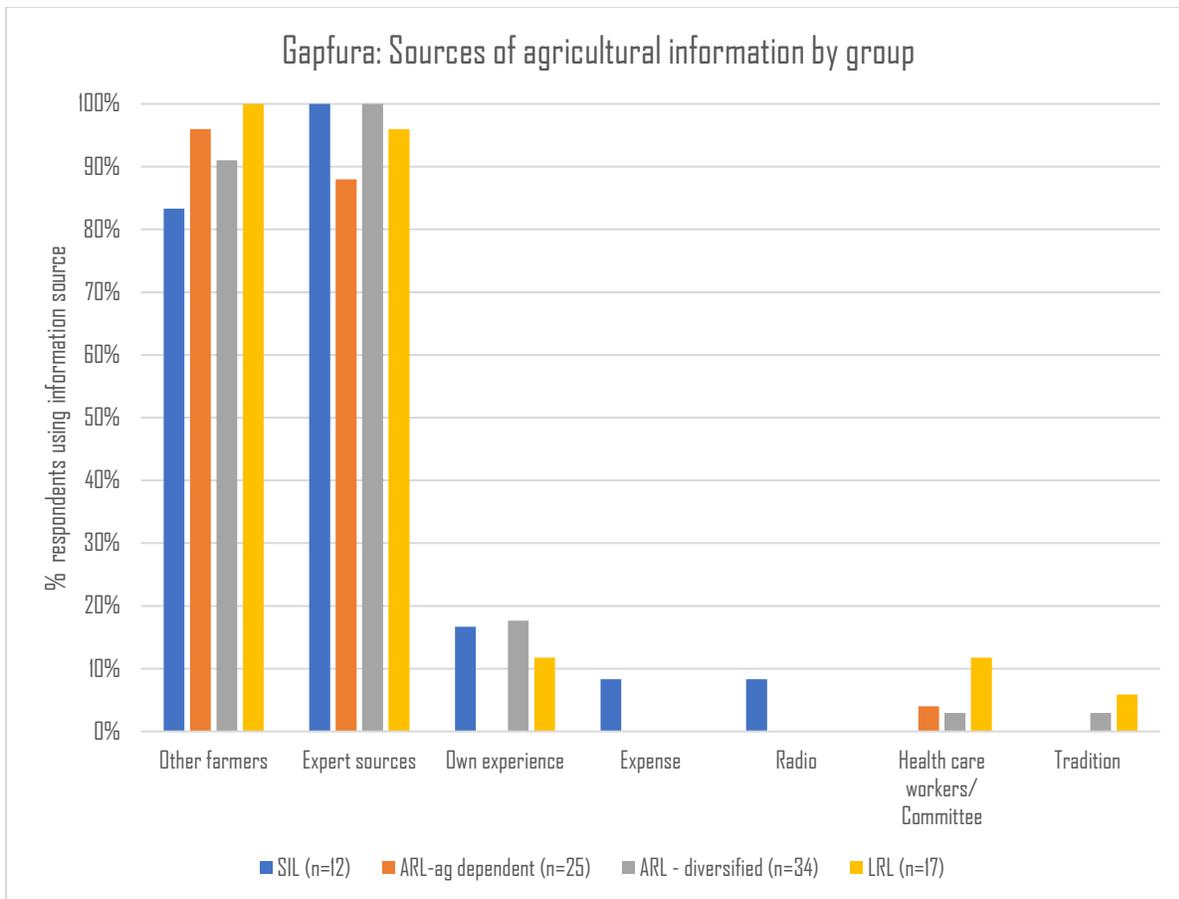


Figure 4.24: Sources of information used by respondents in the four Gapfura vulnerability groups to inform agricultural decisions

The gendered patterns of information use varied across groups. SIL residents were the only group to report clearly gendered patterns of engagement with information that supported their livelihoods decision-making. Among SIL respondents, women were less likely to use information from other farmers and did not report using personal experience to make farming decisions (Figure 4.25). That SIL female respondents have the lowest rates of using information from other farmers is related to the time limitations that their formal employment imposes on their agricultural activities. The pressure to meet formal and domestic work demands perhaps limits the interaction these respondents can have with other farmers. All SIL women reported using information from expert sources. For SIL men, other farmers and expert sources of information were equally important with all SIL men using these sources. As all SIL respondents are using expert information, this strongly suggests that PICSA activities are reaching respondents and that they have enough capacity and confidence in the information provided to employ it in their maize cultivation.

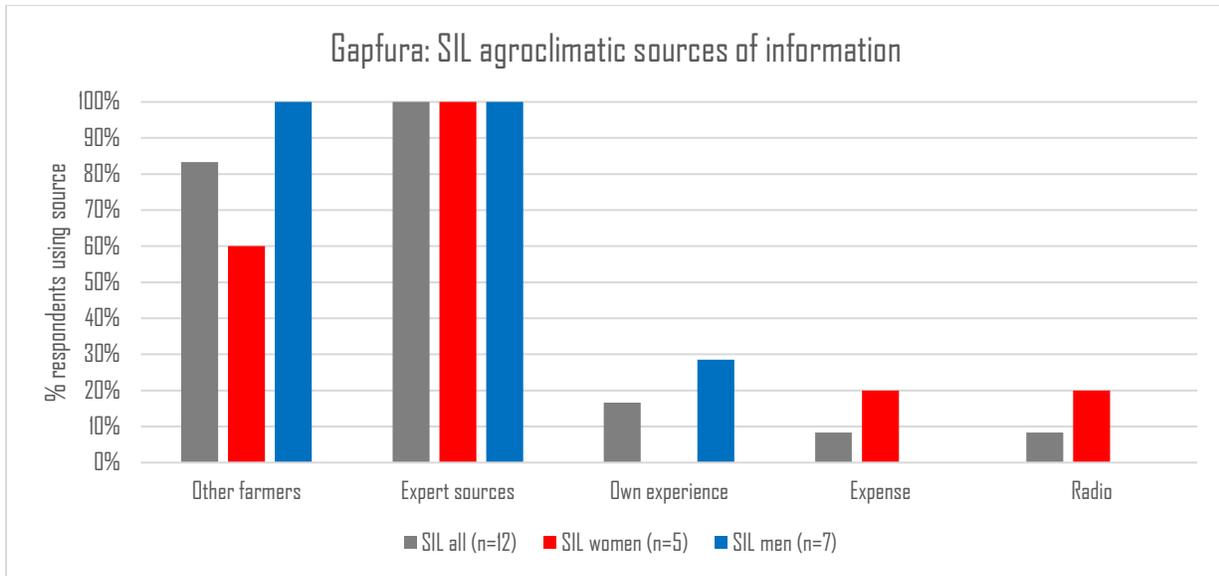


Figure 4.25: Reported sources of information by SIL respondents in Gapfura

The patterns of information use among ARL-ag dependent respondents showed little evidence of gendered engagement (Figure 4.26). Ninety percent of ARL-ag dependent women and 93% of ARL-ag dependent men relied on information from other farmers. The differences between ARL-ag dependent women and ARL-ag dependent men who relied on expert information was also small. Ninety percent ARL-ag dependent women and 87% of ARL-ag dependent men used expert information. There were no ARL-ag dependent respondents who reported listening to the radio as a source of agricultural information or considered expense as part of their decision-making process. However, 10% of ARL women did use information provided by health care workers.

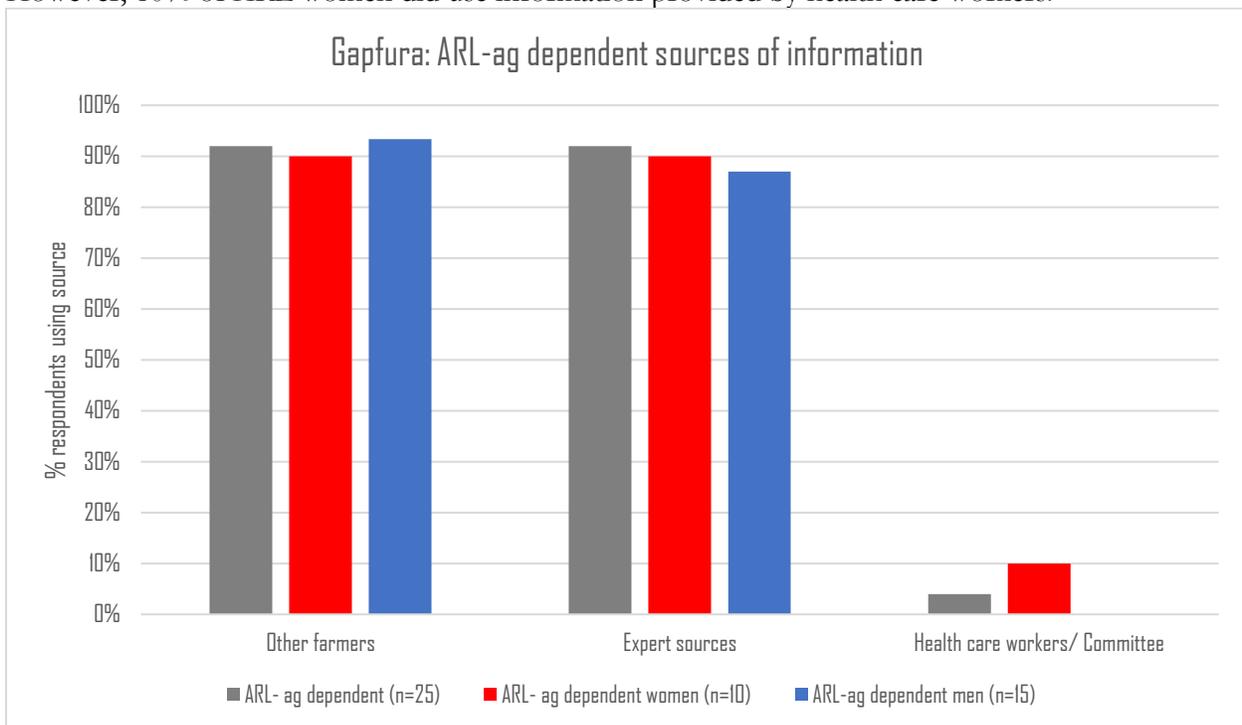


Figure 4.26: Reported sources of information by ARL-ag dependent respondents in Gapfura

Among ARL-diversified respondents, as among those with ARL-ag dependent, there were no significant gendered patterns in the sources of information they used to inform their agricultural and livelihoods decisions (Figure 4.27). Eighty seven percent of ARL-ag dependent women used information from other farmers, while all ARL-ag dependent men reported this as a source of information in their agricultural decision-making. All ARL men and women reported using information from expert sources. Again, this suggests a high level of engagement with PICSA sources of information. Only 4% of ARL-ag dependent women and 9% of ARL-ag dependent men reported use of health workers and tradition respectively.

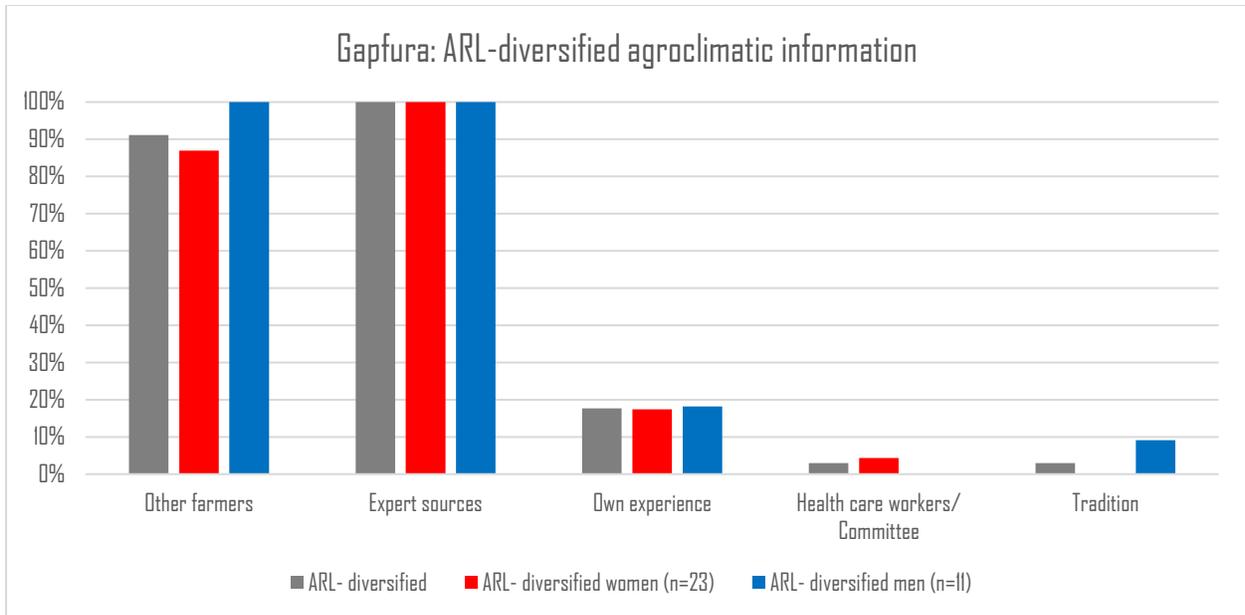


Figure 4.27: Reported sources of information by ARL-diversified respondents in Gapfura

LRL respondents also had relatively consistent levels of engagement with different information sources regardless of gender (Figure 4.28). All women and men in this vulnerability group took advice from other farmers. Ninety two percent of women and 100% of LRL men considered expert sources when making their agricultural decisions. As with the previous two vulnerability groups, the overall number of respondents reporting the use of personal experience, health care workers and tradition was quite small.

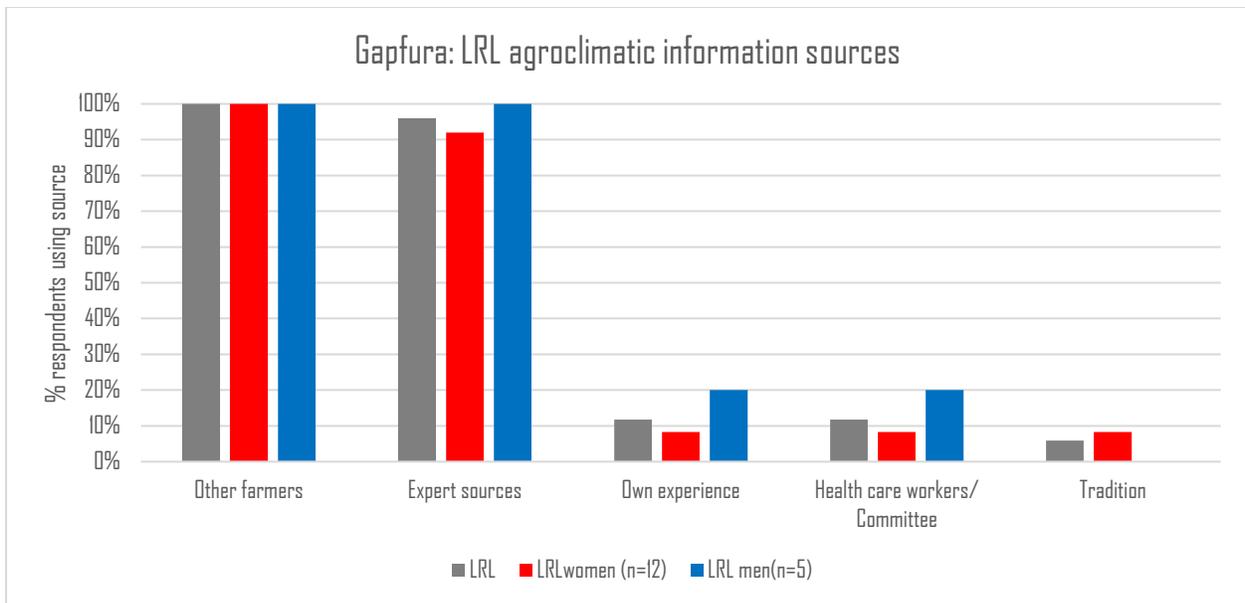


Figure 4.28: Reported sources of information by LRL respondents in Gapfura

Overall, in Gapfura both men and women appear to be equally engaged with formal sources of agricultural and livelihoods information. In addition, there were few discernable differences in the patterns of engagement as the overall livelihood security of individuals changed. The only clear change is that the most secure women in the community reported a much lower rate of reliance on other residents for agricultural information. However, there are several interesting aspects to the use of varying sources of agricultural information in Gapfura. First, farmers were particularly reliant on formal information with regard to maize cultivation. However, in relation to other crops, farmers relied more heavily the advice of other farmers. It is not clear whether this preference is as a result of the lack of formal information in relation to other crops, whether there is information that is available but is deemed as not relevant or not trusted by farmers, or whether the structure of the distribution of maize seed creates a powerful incentive structure for farmers to use formal information related to maize (incentives that are lacking when it comes to other crops). The gap in the use of formal information sources, nonetheless, is important given the varying uses of other crops for food security and household income among respondents with varying levels of security. Second the use of health care works is an interesting “nontraditional” source of information. Overall, the uptake of formal information for agricultural decision-making appears to follow other interventions (i.e. seeds and government preference-setting), but is very high in the context of these interventions. However, the value of maize is different across the vulnerability groups, and even within vulnerability groups. Where some might augment maize harvests for additional income, others will do so to ensure their subsistence. Those seeking to expand production are more likely to have the resources and decision-making capacity to act on this information, and therefore this formal information is likely to provide greater support to their activities and the achievement of their goals. The high uptake of formal information in the context of maize, however, suggests significant potential in the expansion of this information to other crops. However, such expansion should consider carefully which crops are most valuable, and to whom, and also decide which groups within the community are the targets of this information. Answering these questions will result in the most productive targeting of crops in an expanded PICSA process.

4.7 Assemblages of Vulnerability and the Logic of Livelihoods in Gapfura

Having laid out the decision-making structure and patterns of activity that mark livelihoods in Gapfura, we can now apply this information to the interpretation of the assemblages of vulnerability associated with each group in the village. By laying out and explaining the patterns of reported vulnerability within these different groups, we can explain how the logic of livelihoods plays out in that group.

4.7.1 Stable Income Livelihoods

Those with SIL in Gapfura were most likely to have a stable source of cash income, either from formal employment or business activities. Stressors that had an impact on agriculture, however, were important to respondents in this vulnerability group, suggesting that this activity is still central to their livelihoods (Figure 4.29). These respondents, while focused on producing a secure subsistence, were generally confident in their abilities to produce marketable surpluses of staple crops. Although SIL respondents were food secure, it is clear that in cases with formally employed members, households faced critical constraints to the expansion of agricultural activities: labor shortages. As a result of these unique constraints, many SIL households appeared to limit production, seen both in the reduced number of varieties of particular crops they employed, as well as their overall greater engagement with non-farm activities relative to agriculture. The pressures that formal employment place on agricultural activities particularly impacted women, who held more formal employment positions than men. SIL women consistently reported higher percentages of stressors that had an impact on crop production (Figure 4.29). While these households have the capacity to buy produce on the market and report doing so as a core strategy to feed their households, this creates additional livelihood stressors. For example, SIL women's high rate of concern for the lack of employment opportunities is related to their concerns for the long-term stability of formal employment work, and consequently their continued ability to keep feeding their households. The ways in which agriculture is intertwined with formal employment for SIL women is illustrated by GA006, a 27-year-old woman who was a teacher, and who was also married to a fellow teacher. Because she lacked the time to farm herself, and she had a stable income, she hired others to cultivate for her. At the same time, her capacity to engage in agriculture in this manner was limited by her salary, and she has to make hard choices such as forgo state recommended health insurance in order to fund agricultural activities. She explained her livelihood challenges in this way:

In our agricultural activities we meet different challenges. Among them are lack of opportunities [time and effort] to follow up on [agricultural] activities... We spend much money on agricultural activities which does not correspond to yield. Other challenges are low salary. We rent the house we live in because our [own] house is far from the job... We don't get our salary on time, and [over] the holidays they don't give us a salary because we teach in a private school.

SIL men, on the other hand, had higher rates of concern for animal illness, lack of capital for business and artisan activities, and lack of clients for business. This is an interesting pattern of reporting as more SIL women report being engaged in business activities than SIL men and SIL men are only slightly more engaged in animal husbandry than women. This may indicate that these men are much more reliant on animal husbandry and business activities as a means to earn an income and diversify their livelihoods away from a dependence on agriculture. SIL men's concerns therefore reflect challenges they face in securing their animal assets and in growing their incomes, rather than

concerns that are related to a fundamental inability to meet the subsistence needs of their households.

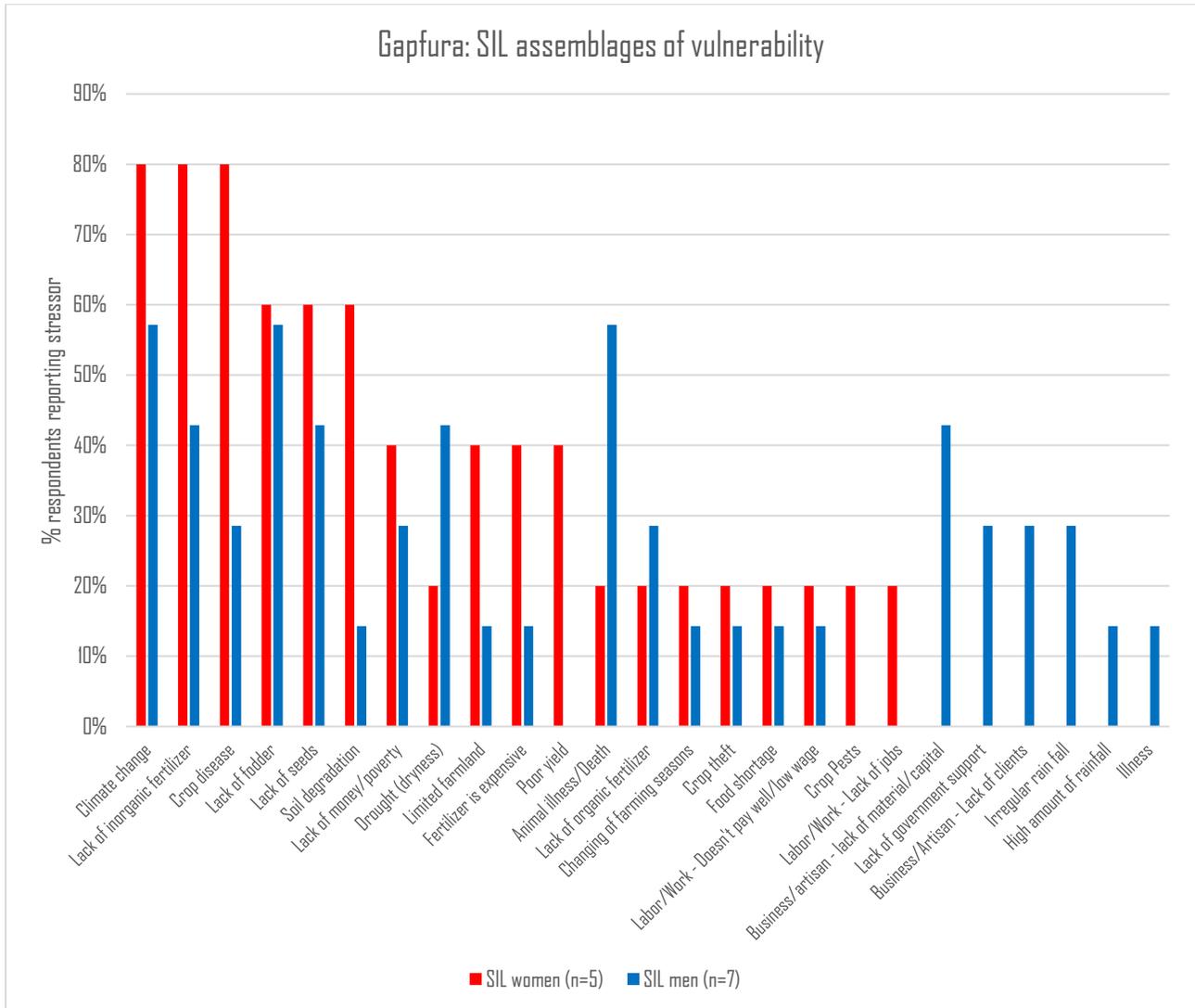


Figure 4.29: Assemblages of vulnerability for SIL respondents by gender

While relative to other community members those with SIL are somewhat secure in their subsistence production and income, the agricultural activities of those with SIL are less diversified than those in ARL-ag dependent and ARL-diversified. This more limited on-farm diversification makes those within SIL vulnerable to environmental stressors that might interfere with agricultural production, such as those related to changes in precipitation and crop diseases. However, those with SIL report overall lower rates of concern for these stressors than the other three vulnerability groups. This is because SIL respondents have both the animal assets and income to manage such shocks, at least for some time. Therefore, the short-term impacts of environmental stressors on their own is likely not be devastating for these households. However, as SIL households are particularly reliant on buying food, a unique vulnerability is the possible interaction of impacts related to environmental stressors and stressors related to food markets and changes in labor conditions. Such

shocks would be particularly devastating for SIL households, who are reliant on formal employment for both their day-to-day livelihoods and their resilience to shocks and stressors.

4.7.2 Adequate Resource Livelihoods - Agriculture Dependent

Those with ARL-ag dependent were more dependent on agriculture and animal husbandry than those with SIL, both as a means of feeding the household and as a way to earn income. These respondents, on average, had more diversified farms, cultivating more crops and crop varieties than those with SIL. ARL-ag dependent respondents were also more market oriented in their agricultural production, as they were more reliant on the sale of market surpluses to earn an income for the household than those with SIL. The greater reliance of this group on agriculture shows up in the high rates of concern over poor yield and lack of fodder in this group (Figure 4.30). Although, at first glance, ARL-ag dependent women and men reported stressors at different rates, a closer look shows that these were parallel stressors. For instance, men were more worried about poor yield but women are more concerned with food shortages; men reported higher rates of concern for soil degradation, while women reported higher rates of concern over inorganic fertilizers; finally, men expressed more concern for crop pests, while women reported higher levels of concern for lack of access to pesticides. These linked concerns all relate to impacts on the productivity of crops and livestock, and therefore the ability of respondents to both feed their households and earn an income. For example, the reliance of these respondents on agricultural production makes the impact of environmental stressors larger on their lives and livelihoods. It is likely that those within this vulnerability group, men and women seek to reduce the risks presented by these stressors by diversifying their production, therefore making their agricultural activities more resilient. Men and women also had similar levels of concern over stressors related to livestock keeping (lack of fodder and animal illness) indicating the reliance of these respondents on livestock keeping.

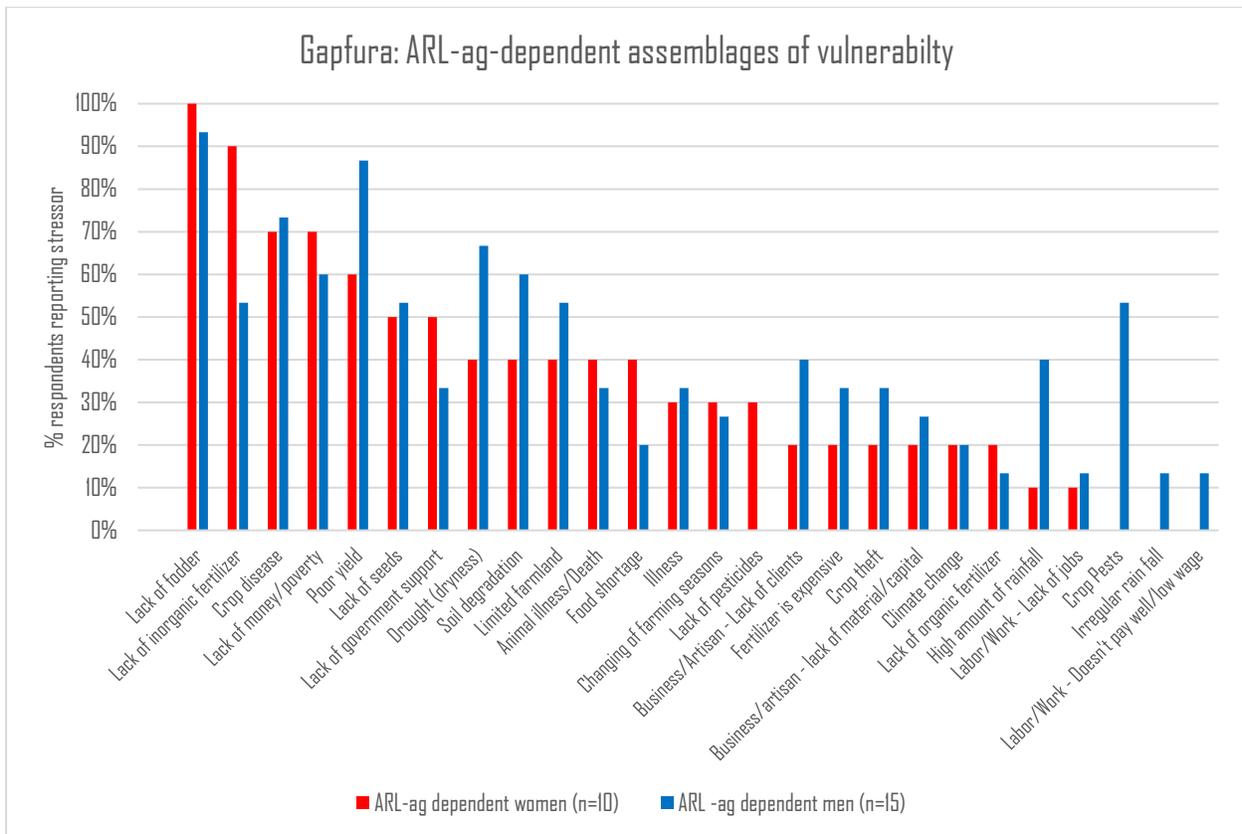


Figure 4.30 Assemblages of vulnerability for ARL-ag dependent respondents by gender

Generally, those with ARL-ag dependent in RL04 are more focused both on securing and on expanding their agriculture and animal husbandry activities. The assemblages of vulnerability within this group are reflective of respondents who have a different livelihood profile from those with SIL, and who are not as secure in their agricultural production and animal husbandry activities. The livelihoods of these respondents are more at risk from environmental stressors, and to counteract this risk ARL-ag dependent respondents are more apt to diversify their production.

4.7.3 Adequate Resource Livelihoods-Diversified

Those with ARL-diversified, as among those with ARL-ag dependent, were heavily reliant on agriculture and animal husbandry as a way to fulfill their responsibilities and feed their households while earning an income. Unlike those with ARL-ag dependent, however, these households had fewer resources with which to engage in these two livelihood activities. This can be seen, for instance, in the much higher rates of concern those with ARL-diversified had for access to land (Figure 4.31). As a consequence, many ARL-diversified households were also reliant on off-farm wage work, particularly cultivating for others, to bring in income. HURDL research from elsewhere (Carr et al. 2016) shows that those who cultivate for others often have to neglect their own farms during peak farming periods (planting, weeding or harvesting) since these are the same times when these work opportunities are available. As such, ARL-diversified agricultural production is impacted by both the nature of their non-farm income opportunities as well as the limited agricultural resources available. This is reflected in the diversification of ARL-diversified agricultural production. While ARL-diversified residents have production that is more diverse than those with SIL, their

production is less diversified than those with ARL-ag dependent. SIL residents are more focused on nonfarm activities and their ability to manage risk through those sources of income. This source of income and the time involved in obtaining it, make diversification unattractive. However, those with ARL-ag dependent lack this deep engagement with nonfarm employment, and therefore have to raise food, earn income, and manage risk on their farms, resulting in a more diverse agricultural setup. those nonfarm activities do not diversify their agricultural production. Those with ARL-diversified also lack access to significant nonfarm employment, but though they share the same risks and strategies with which to earn a living and manage risk, they do not diversify their agricultural production to the same extent as those with ARL-ag dependent. This suggests that those with ARL-diversified *cannot* diversify to the same extent. As a result, ARL-diversified livelihoods are more sensitive to environmental stresses and shocks than those with SIL and ARL-ag dependent. This is not only because these households have fewer assets to rely on to weather hardships. The non-farm income of many ARL-diversified households, anchored in labor on the farms of others, was also directly linked to the stability of agricultural production among those with SIL and ARL-ag dependent. Even though those with ARL-diversified have some assets, particularly animal assets, they can use to survive in case of shocks, the broad assemblage of vulnerability among those with ARL-diversified provides evidence that they are less secure than those with ARL-ag dependent.

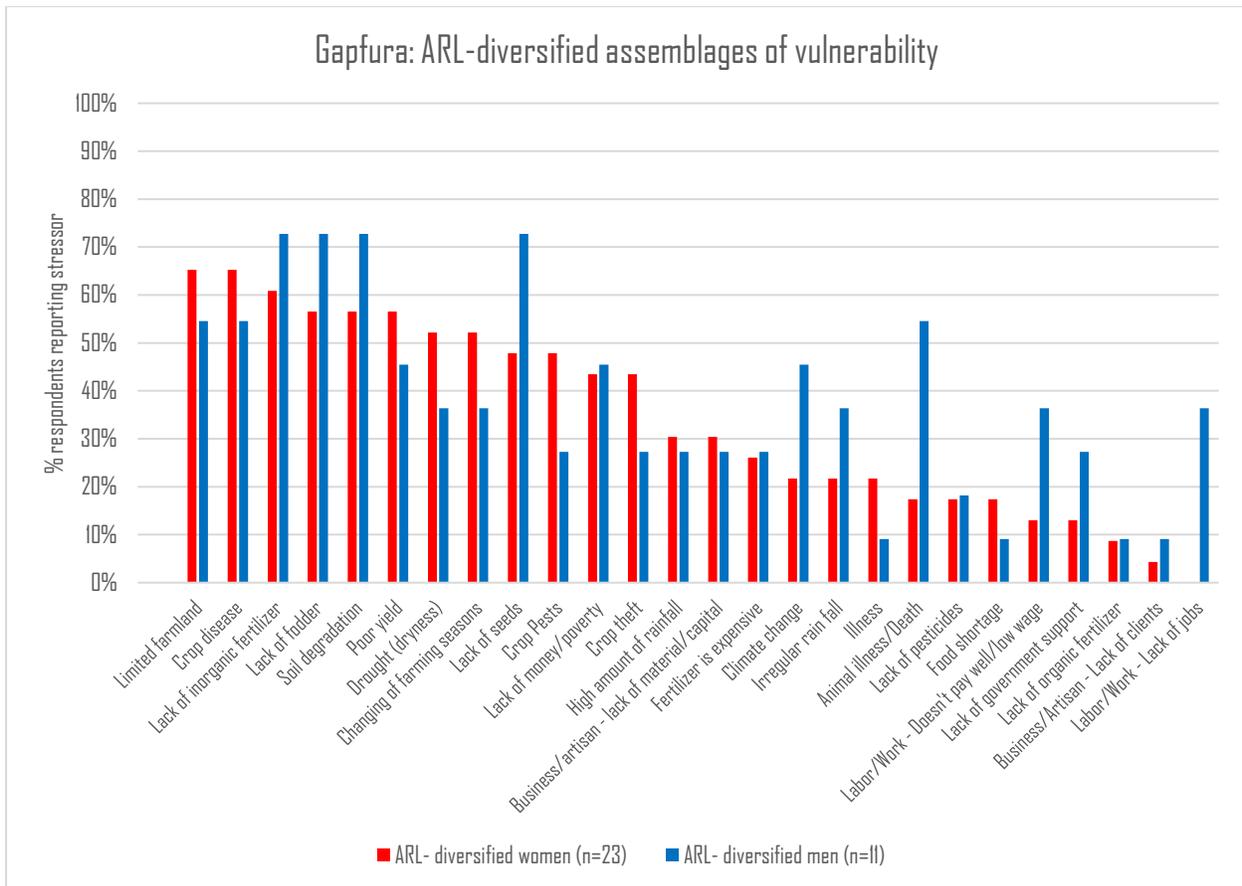


Figure 4.31: Assemblages of vulnerability for ARL-diversified respondents by gender

Gendered patterns within the ARL-diversified assemblages of vulnerability speak to residents' roles and responsibilities. Women's greater reported concerns for crop theft and food shortages reflect

their responsibility of providing their families with food, which makes them more acutely aware of post-harvest loss and the size of meals in the household. Men, on the other hand, were more likely to have higher rates of concern for factors that generally impact food production. This suggests that ARL-diversified men are worried about achieving a secure production level for their households, though the stressors these households face are not yet enough to seriously challenge men's responsibilities to provide for their households.

4.7.4 Limited Resource Livelihoods

Respondents in this vulnerability group have the most limited resource base, including land and availability of labor, from which to pursue the major livelihood activities of any group in Gapfura. That these households have severely limited resources is reflected in their high rates of concern over access to seed and limited land (Figure 4.32). These are two of the most fundamental resources needed to engage in agriculture. These respondents also have the highest rates of concern for poor yield and the second highest rates of concern for limited land. As a result of these limited resources, the livelihoods activities of LRL respondents are insecure. For example, these respondents cultivated a smaller range of staple crop varieties than those with ARL-ag dependent and ARL-diversified. This reduced on-farm diversity, leaving the agricultural production of those with LRL particularly vulnerable to environmental stresses and shocks. While these respondents have fewer resources than those in other groups, state programs have ensured that many LRL households have livestock assets they would otherwise lack. These animal assets can serve as means of addressing the impacts of stresses and shocks on their agricultural production. Those with LRL reported lower rates of concern for drought, crop disease, and pests than any other group. This is not to suggest that those in this group were not concerned about securing their animal assets. Rather, these respondents' concerns were concentrated on the lack of other basic livelihood resources. LRL respondents also had the lowest rates of concern over the lack of business opportunities and lack of clients for business activities. This suggests that for these respondents, in light of their limited resources, business activities were not seen a viable livelihood option.

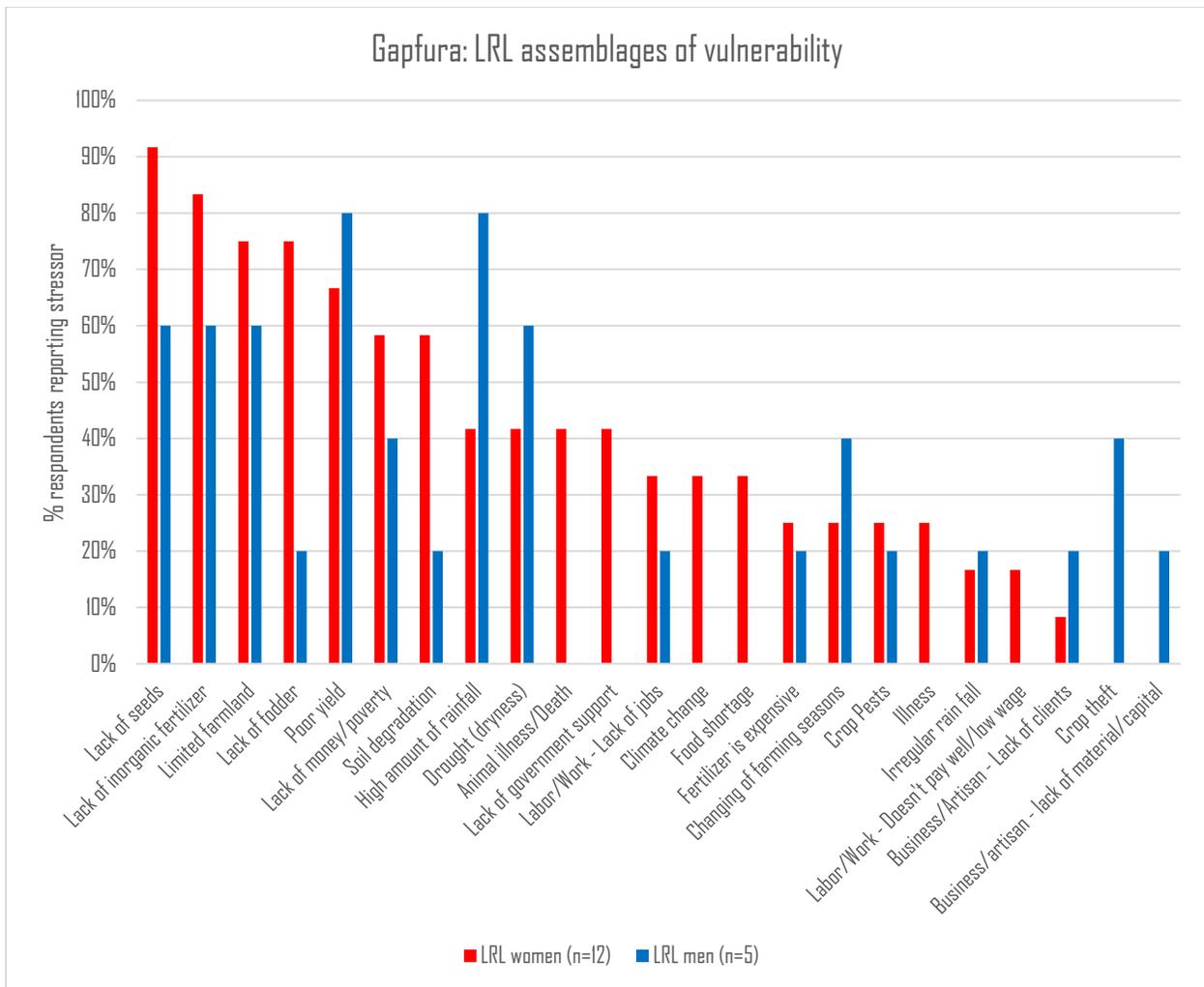


Figure 4.32: Assemblages of vulnerability for LRL respondents by gender

There were gendered patterns within the assemblages of vulnerability among those with LRL. Women reported higher rates of concern for lack of seeds, lack of inorganic fertilizer, limited land, lack of fodder and lack of money. Many LRL women, having been widowed or divorced, were in female-headed households. These circumstances had a large impact on women, as the absence of a male spouse meant they lacked both an important source of labor within the home and a means of access to key livelihoods assets like land. Only LRL women reported concerns over animal illness and death, food shortages and human illnesses. Again, these concerns show how female-headed households are particularly stressed and as a consequence are likely to be more impacted by livelihood stresses and shocks. LRL men were concerned for poor yield, precipitation stressors, crop theft (this is the only group where men are more worried about this stressor than women) and lack of capital for business and artisan activities. The concern over these stressors show respondents who are under pressure both to secure production as well as expand their income earning capacities.

In summary, those with LRL are the most stressed in the community. These stresses are material, but extend to the roles and responsibilities of men and women in a way that we do not see in other groups. Women’s concerns for lack of seeds, limited farmland, lack of money, animal illness, food shortage and illness suggest that female households (within a group that is already very stressed) are

particularly vulnerable. However, the overall vulnerability concerns by respondents in this group suggest both men and women who are struggling to meet responsibilities to their households in the context of severely limited assets.

5 Designing an Effective Impact Evaluation for CIS

The goal of a LIG analysis is to capture the roles and responsibilities played by various members of a community and to explain why members of the community seek to fulfill their roles and responsibilities in particular ways. The LIG analysis presented here has sought also to explain why particular members of the community experience certain vulnerabilities in the way that they do, and how they are likely to respond to available opportunities to address those vulnerabilities or otherwise improve their situations via weather and climate information. This report has, hopefully, accomplished two goals. First, it has established a behavioral baseline for this zone, providing insights into how different community members are likely to experience, prioritize, perceive and make decisions in relation to the vulnerabilities associated with their livelihoods. Second, in laying out the existing logic of livelihoods in this zone, it provides a baseline against which to measure future logics of livelihoods to understand how CIS interventions have an impact not only on material aspects of people's livelihoods but also on the logic of those livelihoods. Finally, it identifies the most likely pathways through which this information is likely to impact individual goals, and therefore decisions and practices aimed at those goals. Therefore, this project has provided the information necessary to design and implement a rigorous impact assessment of the PICSA project as it is implemented across Rwanda.

An effective impact evaluation of the PICSA project will require certain characteristics.

5.1 Sample stratification

- In Zones RL12 and RL04:
 - Stratify the population by the vulnerability groups described in this report.
 - Stratify the vulnerability groups by gender.
 - Within both zones a stratification of the population by vulnerability group and gender captures most of the difference in roles, responsibilities, and decision-making opportunities that shape observed livelihoods outcomes.
- In other livelihoods zones:
 - Identify vulnerability groups within the population. If livelihoods activities, or crops cultivated, are different than those seen in RL12 and RL04, these groups are likely to be different as well.
 - Stratify the vulnerability groups by the social characteristics that shape the roles and responsibilities of individuals vis a vis activities that might be shaped by climate information.
 - Areas where livelihoods are organized around monogamous households are likely to require stratification by gender
 - Areas where livelihoods are organized into concessions or compounds of multiple households will likely need stratification by gender and seniority

- In areas where multiple ethnicities live in shared communities, investigators should determine if different ethnicities have different roles and responsibilities to decide if this is a relevant social difference.

5.2 Identifying uptake and use

- In Zones RL12 and RL04:
 - Uptake and use of climate information is a product of three key factors emerging from livelihoods in this zone:
 - *Whether one's roles and responsibilities provide the opportunity to make decisions about livelihoods that might be informed by this information.* In Rwanda, roles and responsibilities around livelihoods activities are not as clearly gendered as in other contexts (e.g. Carr, 2013; Carr, Fleming, & Kalala, 2016; Carr & Onzere, 2018; Carr & Owusu-Daaku, 2016). However, as the discussion of identity above lays out, there are different roles and responsibilities associated with livelihoods in this zone. For example, women in zone RL12 could not engage in market-focused agricultural production without the permission of their husbands. Therefore, women will encounter barriers to the use of information about certain crops whose principle value might be for market sale.
 - *Whether one has access to the assets needed to respond to the information. Responding to advice about what to plant and when requires timely access to appropriate seeds, traction, and equipment.* For example, those with LRL in both zones are often performing labor on the farms of others in their community at the start of the season. As a result, they are not able to respond to forecasts or other forms of agricultural advisory until later in the season, when their latitude for cycle length and other characteristics declines, making such information less useful.
 - *Whether one feels the need to change livelihoods practices to achieve goals, whether personal goals or goals shared by a household or community.* Those with SIL in Zone RL04 are relatively secure in their lives and livelihoods, and meet many of their needs through participation in non-farm employment. As a result, agriculture is becoming an activity of equal, if not secondary, importance to achieving their goals. While weather and climate information might improve their agricultural outcomes, to take up that information in a vigorous manner would require those with SIL to back away from their non-farm activities, an unlikely outcome given their current success.
- In other livelihoods zones:
 - Gather uptake and use data via sampling that accounts for the stratifications identified through the steps above
 - Community-level data on uptake and use obscures critical differences in the levels of uptake/use across vulnerability groups, and within vulnerability groups. This makes explaining overall rates of use impossible, as the overall rates of use are just aggregations of many different rates of uptake and use determined by roles and responsibilities, and access to the assets needed to live up to the expectations associated with particular roles and responsibilities
 - Failure to properly stratify the populations of each livelihoods zone is likely to overlook segments of the population that are using the information, as well as those who are not/cannot use the information.

5.3 Identifying impacts of use in Zones RL12 and RL04

While it is possible to lay out principles of sample stratification that inform work in any livelihoods zone in Rwanda, identifying a general set of measures and indicators of impact is much more difficult. Appropriate measures will be specific to livelihoods zone, vulnerability group, and identity, as climate information will impact people across these axes differently. As described above, HURDL employed the LIG approach to establish the different patterns of decision-making in Zones RL 12 and RL04. Those patterns enable the identification of the following measures and indicators of impact, and the expected direction of change for each, in this zone.

- Across all groups
 - It is critical to identify whether yield increase or avoided loss best characterizes the outcomes of information use, as this will define how to interpret crop and variety selection. Crop and variety selections should shift to achieve one or both of these goals, and ideally should be tied to climate information provided by this program.
 - Rigorously assessing the outcomes of information use via crop and variety selection requires more information that can only be gathered across successive agricultural seasons with different conditions:
 - Different groups might use the same information for different goals (yield increase versus avoided loss)
 - Groups may use the same information to different ends depending on seasonal conditions (boosting yields in a good year, while avoiding losses in a challenging year)
 - Different sources of information might be more useful for avoiding loss than boosting yields, and vice versa.
 - Appropriately calibrating “control” levels of production against which to measure avoided loss or increased yields will also require data from multiple agricultural seasons under different conditions.
- In Zone RL12
 - Among those with SIL
 - Impacts will likely be captured in some form of yield increase, as it is a goal of those in this group. However, their livelihoods are agriculture-focused, which leaves them exposed to environmental shocks. Therefore, if clear signals of increased yield are not present, avoided loss in years of poor rainfall or other problematic conditions should be accounted for as this is a likely use of the information. Maize and beans will be the focus of initial changes, which will become visible in either the greater marketing of surpluses, or the presence of surpluses in years where conditions would have previously made such production difficult. Eventually, participation in banana cultivation and banana yields should also increase.
 - In this group, maize cultivation will likely start to incorporate greater amounts of *Kanyamumesa* and *Kigega* varieties when conditions are appropriate, as these are currently sold more than eaten, but also cultivated because they have a pleasant taste.
 - Livestock ownership might not change significantly, even if the information provided to those in this group is both accurate and useful for agriculture. This

- group is already fodder-constrained, and adding animals (at least large animals like cows and oxen) may not be feasible with incremental changes in income and yield.
- Among those with ARL
 - While yield increase is an appropriate measure of project impact for those with ARL, there are important limiting factors that will have to be accounted for in measuring yield changes.
 - This group is land-constrained, and climate information alone will not alter this constraint. Therefore, to achieve higher yields, members of this group will have to shift the mix of crops they cultivate, and the specific varieties they select, to maximize yields and income, but may not be able to plant more crops overall.
 - At the same time, the livelihoods of those with ARL are both agriculture dependent and lack some of the assets that their SIL counterparts use to offset risk. Their current crop and variety mix accounts for these risks. Therefore, they are not as likely to shift their variety selections to achieve these increases, at least not until the information has been proven reliable with regard to the selection of seasonally-appropriate crops and varieties.
 - As among those with SIL, their agricultural focus leaves them exposed to environmental shocks, and so avoided loss in years of poor rainfall or other problematic conditions should be accounted for as this is a likely use of the information as well.
 - ARL men's cultivation of cassava will likely decline if the information is useful, as cassava is used as a hedge against shocks and stresses. Further, its cultivation is frowned upon by the Rwandan government, giving farmers another incentive to shift out of its cultivation when they no longer require it.
 - ARL men's maize production is likely to become more market-oriented, as men become more confident in their ability to generate a marketable surplus. This may be accompanied by a shift into *Kanyamumesa* and *Kigyega* varieties.
 - Among those with ARL-no livestock
 - This group is highly dependent on agriculture for food and income, and have almost no animal assets with which to address shocks and stressors. Their agricultural strategy is more defensive than among those with SIL or ARL, oriented toward achieving security more than achieving increases in income or material assets. At least initially, the most important indicator of uptake is likely to be in the realm of avoided loss, as these households lack the labor and land necessary to extensify their farms.
 - Reliable information might produce changes in the varieties selected for beans, shifting some women's production out of *Coltan* into the more marketable *Shushya*. Men are already heavily focused on *Shushya* production in this group. This information might also produce a shift in the cultivation of maize varieties, away from *Gatumane* into the more marketable *Kanyamumesa*. Both men and women could make this shift. However, such shifts would only be recorded in years where the environmental conditions were favorable for these varieties and market conditions would support their sale.
 - A critical constraint on possible shifts in variety selection is their contingency on the availability of appropriate seeds. Not only must the appropriate seeds be

- available, but those with ARL-no livestock must be in a position to purchase those seeds. Members of this group have few livestock assets to use for such purchases, and therefore might encounter significant barriers to responding to otherwise-trusted information.
- If the information makes their harvests more productive and reliable, members of this group will start to accumulate animal assets. This, over time, could produce a change in the orientation of their livelihoods from defensive to more aspirational, as seen among those with ARL.
 - Among those with LRL
 - This group is unlikely to show significant short-term increases in yield. Those with LRL are the most land- and labor-constrained, and as a result cultivate the smallest number of total crops. These crops are also less diversified by variety than in other groups. Therefore, benefits from climate information are likely to be most visible in avoided loss during challenging years.
 - Changes in variety selection will be contingent on two things:
 - A level of security that allows members of this group to disengage from laboring on other people's farms. As long as they work on the farms of others, their growing season will be shorter, and their variety selection options fewer.
 - The ability of this group to access appropriate seeds. Because government programs have ensured an asset base for even these households, they should have the capacity to access seeds if they are locally available.
 - In Zone RL04
 - Across all groups, the level of reported use of expert advice and information (such as extension, climate services, etc.) was extremely high – at or above 88% in all groups. As a result, the introduction of PICSA may not have a dramatic effect on decision-making and livelihoods outcomes.
 - Among those with SIL
 - SIL residents may not show clear signs of yield increase, even in the context of salient, reliable, trusted information. Residents with SIL have stable, secure incomes and are more focused on non-farm sources of income than any other group in this zone. Because of the time constraints created by their nonfarm activities, they already have challenges in providing enough labor to meet their households' agricultural needs. Therefore, many members of this group will not increase the size of their fields, as this would entail more work. Instead, they are most likely to shift crops and varieties to those with greater market value, assuming conditions are favorable.
 - Men are somewhat less engaged with nonfarm employment, and those men who do not have nonfarm employment may expand their farms.
 - Most women have nonfarm employment, and therefore will not be able to expand their own production or help in the expansion of their husbands' production
 - Nearly all men with SIL already plant the five most common staples, and while there is room to increase the number of men cultivating yams, on the whole their crop diversity is not likely to significantly increase. Women already cultivate three

- staples, but their time and labor constraints suggest they may not show increases in their crop diversity either.
- Variety selections for subsistence staples are unlikely to shift, as in the case of maize the government both incentivizes and obliges farmers to cultivate *Sunkorebo*. Similarly, for bean production the most common variety selected, *Inyumba*, was provided by the government.
- Among those with ARL-ag dependent
 - If PICSA delivers useful information, ARL residents will likely increase their yields. They are heavily focused on agriculture and livestock husbandry, but incorporate a range of other activities into their livelihoods. Some members of this group will not be able to respond to even the most salient advice, as they are working for other farmers and therefore cannot act on such advice until they move on to their own fields.
 - These households are already cultivating a diverse set of crops, including staples. There is room to increase participation in yam cultivation, but it seems more likely that both men and women would use the information to ensure their subsistence in these staples, and sell any surpluses that resulted.
 - Therefore, the most likely pathway to impact is through changes in the varieties members of this group select. Currently, respondents from this group are cultivating varieties that are subsistence-focused, but could shift their production into different varieties if the seeds are present and market conditions are right.
 - Members of this group are already accumulating animals, and while animals are useful assets, they are also a source of stress when their owners have trouble finding adequate fodder. Given the high rate of concern for access to adequate fodder in this group, it seems unlikely that there would be a surge in large animal ownership, even if yields and incomes increased.
 - Among those with ARL-diversified
 - This group is unlikely to show significant short-term increases in yield. Over 60% of men and women in this group report engaging in day labor and informal work, such as working on the farms of others in the community. This places constraints on their own production, delaying it such that even useful advisories may not provide value to their decisions.
 - Their crop selections are the most diverse in the community already, and therefore the number of crops on their farms is unlikely to increase
 - To the extent the large number of crops on the average ARL-diversified farm represents a hedge against uncertain economic and environmental conditions, reliable, salient weather and climate information might allow those in this group to focus their efforts on fewer, but more valuable, crops.
 - For example, they are not currently reporting marketable surpluses of beans, with only men reporting small surpluses of maize. With reliable information, members of this group would likely boost their yields of maize and beans to ensure subsistence while generating a marketable surplus.

- In this group, agricultural strategy is defensive, so any shifts in variety selection or crop emphasis will first ensure subsistence, and then work toward marketable surpluses.
 - Among those with LRL.
 - This group is also unlikely to show significant short-term increases in yield. Those with LRL are the most land- and labor-constrained, and as a result cultivate the smallest number of total crops. These crops are also less diversified by variety than in other groups. Therefore, benefits from climate information are likely to be most visible in avoided loss during challenging years.
 - This is particularly true because nearly all members of this group labor on the farms of others in the community, delaying the start of their own production. In such a situation, information is likely to be used to ensure subsistence in both good and adverse years.
 - Changes in variety selection will be contingent on the ability of this group to access appropriate seeds. Because government programs have ensured an asset base for even these households, they should have the capacity to access seeds if they are locally available.

Identifying the impacts of use in other zones will require a similar behavioral baseline exercise to establish current conditions and decision-making against which to track the impacts of climate information use. However, once these baselines are established, they can be used to provide rigorous, nuanced interpretations of other datasets, such as panel surveys, that are already implemented and frequently updated. A subsequent CISRI report exploring the integration of ethnographic and large-scale survey data takes this up in more concrete detail.

6 Advancing the Design, Monitoring, and Evaluation of CIS

This report speaks to two CISRI learning agendas intended to identify and address knowledge gaps in the field of climate information services. The first of these speaks to the identification of CIS users and their needs (Carr, Goble, Rosko, Vaughan, & Hansen, 2017). That learning agenda laid out a series of questions that required more evidence or research to answer constructively. This study speaks to several. First, the agenda asks *“Over what spatial region or social groupings can a particular CIS be scaled? What factors affect that?”* (Carr et al. 2017: 29). This study suggests that there are important differences in behavior and decision-making that appear when we compare groups at the scale of the livelihoods zone. This suggests that climate information is not likely to have the same utility or uptake across livelihoods zones without a degree of zone-specific tailoring.

While there are important differences in the information needs between residents in different livelihoods zones, those needs will also vary within a given livelihoods zone. While some of this variation can be traced to the asset ownership of the individual in question, other factors affect the constraints on and opportunities for the use of climate information, such as the roles and responsibilities associated with the individual in question. By examining the factors shaping the different information needs seen across two livelihoods zones in Rwanda, this study provides information in response to the question *“What are the broad lessons we might learn about the social constraints to the use of climate information?”* (Carr et al. 2017:29). The LIG analysis above identifies a range of social constraints in the use of climate information. For example, formal employment constrains the amount of time women have to work on their fields. These specific findings point to

a wider process that those seeking to better understand the sources and impacts of social constraints on the use of climate information might use, including:

- 1) Stratify the community into vulnerability groups to identify who is vulnerable to which shocks and stressors.
- 2) Identify the principle aspects of identity that shape roles and responsibilities in the area in question.
- 3) Identify the consequences for those who do not conform to expectations.

The evidence at hand suggests that, at least in Zones RL12 and RL04, we cannot assume that the way climate information works in one zone will work in a similar manner across zones. This study therefore suggests that CIS should be tailored to at least the livelihoods zone level. The information that emerges through each of these steps will vary by livelihoods zone, but will help to identify livelihoods-zone specific social constraints to the use of climate information.

Third, the agenda asks “*What are the differences in information gleaned through different methods, and how might different approaches be integrated to draw on strengths and eliminate gaps?*” and “*What are the most effective means of learning about users and needs in a given place?*” (Carr et al. 2017: 29). While this study is purely qualitative, and largely ethnographic in its approach, it serves to highlight the sorts of information that such work can provide to our understanding of CIS users and needs. While surveys are useful tools for gathering large numbers of observations about outcomes, when applied to the social realm they are less useful for interrogating the causes of those outcomes. Ethnographic information focused on livelihoods decision-making explains these patterns, and comes with a high degree of internal validity, as it has been triangulated across several individuals and data sets. While we argue that the evidence from Zones RL12 and RL04 have external validity at the scale of the livelihoods zone, this claim only holds for the structure of decision-making. This study does not claim to have a representative understanding of the material outcomes of those decisions across an entire zone, and therefore the external validity of its findings with regard to material outcomes is limited. A subsequent CISRI report will explore the integration of this ethnographic data with systematic survey data collection to link livelihoods decision-making to externally-valid observations of material outcomes, allowing for the rapid and relatively cheap design and evaluation of a variety of programs in which a LIG analysis has been undertaken.

This project also speaks to the CISRI learning agenda on monitoring and evaluating climate services (Vaughan, Hansen, Roudier, Watkiss, & Carr, 2017). For example, in elucidating the goals of different actors in a livelihoods zone, this study demonstrates how to *identify and potentially measure a broader range of impacts than yield alone* (Vaughan et al. 2017: 23). For example, in RL12, the program is reaching women in resource-poor households but not men in these same households. Given that men still make final decisions about the use of land, but are more subsistence-oriented in their production than women (see discussion on LRL crop utilization in Kabeza, page 44 of this report), women’s use of weather and climate information must negotiate access to land via individuals who do not share their desired agricultural outcomes. To better meet women’s needs, we must acknowledge gendered differences in needs and capacities, and understand the ways in which the provision of CIS not only improves production at household level but also how it speaks to the goals of men and women at the sub-household level. This study also helps deepen the ways in which we *interpret existing results* of CIS (Vaughan et al. 2017: 24). By more clearly defining who the users of the PICSA process are, what their needs for weather and climate information are, and what sorts of impacts might be produced by the delivery of credible, salient information, this study demonstrates

the sorts of information that are needed to design impactful CIS, and what information is needed to monitor and evaluate CIS as they seek to achieve these goals.

In summary, taking a detailed, qualitative approach to the livelihoods of prospective climate service users serves to better understand who these users are, what their needs are, and how CIS can fill some of these needs. Further, this approach clearly identifies the most likely pathways through which a CIS might address user needs. This information facilitates the design of impact assessments that measure relevant indicators of impact and whose interpretations are informed by empirical evidence. Taken together, this approach shows potential for designing effective CIS, and monitoring and evaluating such CIS to maximize learning, such that weather and climate information might live up to their potential as tools for development and adaptation.

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